2024 ANNUAL MEETING

OFFICIAL PROCEEDINGS, Volume XXV

Scientific Session Abstracts

Scientific Session Awards

Abstracts presented at the Society's virtual scientific session will be considered for the following awards:

- The **George Peters Award** recognizes the best presentation by a breast fellow.
  In addition to a plaque, the winner receives $1,000. The winner is selected by the Society's Annual Meeting Scientific Committee.

  The award was established in 2004 by the Society to honor Dr. George N. Peters, who was instrumental in bringing together the Susan G. Komen Breast Cancer Foundation, The American Society of Breast Surgeons, the American Society of Breast Disease, and the Society of Surgical Oncology to develop educational objectives for breast fellowships. The educational objectives were first used to award Komen Interdisciplinary Breast Fellowships. Subsequently the curriculum was used for the breast fellowship credentialing process that has led to the development of a nationwide matching program for breast fellowships.

- The **Scientific Presentation Award** recognizes an outstanding presentation by a resident, fellow, or trainee. The winner of this award is also determined by the Annual Meeting Scientific Committee. In addition to a plaque, the winner receives $500.

- All presenters are eligible for the **Scientific Impact Award**. The recipient of the award, selected by audience vote, is honored with a plaque.

- The **Best Poster Award** recognizes the best poster presentation in the top ten poster category. The recipient of the award, selected by audience vote, is honored with a plaque.

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Contents

Scientific Oral Presentations I

Friday, April 12, 2024 1:15 pm–2:30 pm Moderators: Zahraa Al-Hilli, MD, FACS; Sarah L. Blair, MD, FACS

1752283 - GEnetic Testing For All breast Cancer patienTS (GET FACTS) – Results of a Randomized Clinical Trial

Anna Weiss[1], Danielle Braun[2], Jill Stopfer[3], Stephen Knapp[4], Monica McGrath[5], Kaitlyn Bradshaw[5], Dillon Davis[3], Judy Garber[3], Tari King[5]

[1]University of Rochester, Fairport, NY, [2]Harvard T.H. Chan School of Public Health, Dana-Farber Cancer Institute, Boston, MA, [3]Dana-Farber Brigham Cancer Center, Boston, MA, [4]Knapp Consulting LLC, Boston, MA, [5]Brigham and Women's Hospital, Boston, MA

Background/Objective: Increasing germline genetic testing rates may impact contralateral prophylactic mastectomy (CPM) rates in newly diagnosed breast cancer patients, even in those without a germline pathogenic variant (PV). After the American Society of Breast Surgeons recommended consideration of genetic testing for all breast cancer patients, we designed a novel personalized cancer-risk counseling tool, including contralateral breast cancer (CBC) risk estimates. We hypothesized that this tool may better inform patients of their CBC risk based on their genetic testing results, aiding patients and providers to make informed shared surgical decisions.

Methods: We randomized patients 1:1 to our novel tool, which we called "quantitative counseling", versus standard genetic counseling which does not typically include specific CBC risk estimates. Patients aged 18-80 years with a unilateral breast cancer undergoing genetic counseling and surgery at our institution were eligible. Exclusion criteria included prior or metastatic breast cancer or prior multi-gene panel testing. After informed consent was obtained, individual CBC risks were estimated for each patient using statistical methodology from "ASK2ME" (https://ask2me.org/) modified based on external advisory board input for those with a PV and the validated risk model "CBCRisk" (https://cbc-predictor-utd.shinyapps.io/CBCRisk/) for those without a PV. The co-primary endpoints included patients' personal CBC risk assessment and propensity to undergo CPM, compared pre- and post-counseling. Secondary endpoints included genetic testing satisfaction and CPM rates. The sample size was calculated based on the difference between baseline and post-counseling CBC risk self-assessments. Assuming a difference of 5% and expected standard deviation of 20%, 199 patients were needed in each arm to achieve 80% power and a type I error of 5% (based on a two-sample t-test).

Results: We randomized 400 patients between June 8, 2020 and December 2022. Patients were unevaluable if they sought surgery elsewhere (N=49) or their primary endpoint could not be calculated (missing baseline or post-counseling assessments, N=39); 312 remained in the intent to treat analysis. Patients' baseline calculated CBC risks were similar between arms (mean 11.9 quantitative, 10.4 standard, $p = 0.11$). Patients in the quantitative arm more accurately reported their calculated CBC risk post-counseling compared to those in the standard arm ($p < 0.001$, Table). Patients' propensity to undergo CPM was largely unchanged and similar in both arms, 44% no change after quantitative and 57% no change after standard counseling ($p = 0.2$). Regarding genetic testing satisfaction, patients in the quantitative arm reported that the information presented was less confusing (mean score 1.6 vs 1.9 standard arm, $p = 0.002$). Lastly, CPM rates were not statistically significant between arms (17% quantitative versus 10% standard, $p = 0.082$).

Conclusions: Patients were able to more accurately describe their calculated CBC risk after quantitative counseling and were more satisfied with their counseling than those in the standard arm. The form of genetic counseling did not impact propensity to undergo CPM or CPM rates, suggesting patients make surgical decisions based on strongly held beliefs formed before their consultations. Surgeons and genetic counselors may consider incorporating our novel CBC risk assessment tool into their pre-operative discussions to help patients make informed decisions.

Table 1: Change in accuracy of patients' self-assessed CBC risk estimates after their counseling sessions

Characteristic	Overall, N = 312	Quantitative, N = 151	Standard, N = 161	p-value
Patient's self-assessed CBC risk, pre-testing (%)				0.5[1]
Mean	29.7	28.2	31.0	
Patient's self-assessed CBC risk, post-counseling (%)				**<0.001**[1]
Mean	26.0	20.0	30.7	
Quantitative tool's CBC risk estimate				0.11[1]
Mean	11.1	11.9	10.4	
Quantitative tool's minus patient's self-assessed risk estimates, pre-testing (%)				0.2[1]
Mean	-18.8	-16.6	-21.0	
Quantitative tool's minus patient's self-assessed risk estimates, post-counseling (%)				**<0.001**[1]
Mean	-15.1	-8.0	-20.6	
Change in accuracy of patient's self-assessed CBC risk estimates after counseling				**<0.001**[1]
Mean	5.2	10.4	1.0	

[1] Wilcoxon rank sum test. **BOLD** indicates a statistically significant P value.

1761458 - Cryoablation Without Excision for Early-stage Breast Cancer: ICE3 Trial 5-year Follow-up on Ipsilateral Breast Tumor Recurrence

Richard Fine[1], Richard Gilmore[1], Jill Dietz[2], Susan Boolbol[3]

[1]West Cancer Center & Research Institute, Germantown, TN, [2]Cleveland, OH, [3]Nuvance Health, Poughkeepsie, NY

Background/Objective: The ICE3 Trial was designed to evaluate the safety and efficacy of cryoablation, allowing women age >60 with low-risk, early-stage breast cancers to benefit from a non-operative treatment of their tumor and avoid the associated risks of surgery. Ipsilateral breast tumor recurrence (IBTR) at 5 years was the primary outcome. Interim results showed a 2.06% IBTR at a mean follow-up of 34.8 months. This work presents 5-year follow-up trial results.

Methods: The ICE3 trial is an IRB-approved, prospective multi-centered, non-randomized trial including women ≥ 60 years with unifocal, ultrasound visible invasive ductal carcinoma ≤ 1.5cm in size, HR+, HER2- and breast size allowing safe cryoablation. The office-based procedure performed under ultrasound guidance with local anesthesia requires 20-40 minutes, depending on lesion size. Choice of appropriate adjuvant treatment was left to the discretion of the treating physician. Patients were followed at 6-month intervals and annually up to 5 years, with clinical and imaging assessment. Patient and physician satisfaction with cosmetic results was also evaluated. Adverse events were defined and classified according to the Common Terminology Criteria for Adverse Events. Quality of Life (QOL) was assessed using the NCCN Distress Tool at baseline and 6 months post cryoablation. Satisfaction was assessed using the 5 Likert scale at 6 months and annually up to 5 years.

Results: Of the 211 screened patients, 5 failed screening and an additional 9 were enrolled but ineligible by protocol. Thus 197 patients were in the intension to treat cohort, 3 of whom did not receive complete protocol mandated treatment. Altogether, 194 patients meeting eligibility received successful cryoablation treatment per protocol and were included for analysis. The mean age was 75 (55-94) and the mean tumor size was: 7.4 mm Transverse (2.8 -14.0 mm), 8.1 mm Sagittal (8.0-14.9 mm), and 6.3 mm Anterior/Posterior (1.0-14.0 mm). At 5 years (mean follow-up period of 51.5 months), the IBTR rate was 4.3% and breast cancer survival was 96.2%. Of the 148 patients who received endocrine therapy, the IBTR was 2.7%. No serious device-related adverse events or complications were reported. Minor adverse events were bruising, localized edema, skin freeze burn, rash, bleeding from needle insertion, local hematoma, skin induration, infection, and pruritis. Twenty-seven patients underwent adjuvant radiation with no difference in adverse events from the nonradiated group. At 5 years clinical follow-up, 100% of patients and physicians reported satisfaction with the cosmetic results. QOL score demonstrated statistically significant improvement ($p < 0.001$) in distress at 6 months (median 2.0, range 0.0-10.0) as compared to baseline (median 4.0, range 0.5-10.0).

Conclusions: The ICE3 trial is the largest prospective non-randomized cryoablation trial of early-stage, low-risk breast cancer without subsequent tumor excision. Breast cryoablation is a safe, percutaneous ablative procedure with acceptably low 5-year recurrence similar to that of lumpectomy with the benefit of being an office based, nonsurgical treatment. Further study within a clinical trial or registry with longer term results should help define appropriate patient selection and confirm that cryoablation is a patient-centric alternative to surgical excision in appropriately selected patients.

Table 1: Local IBTR recurrence rate

Time	N start*	Cumulative Recurrence	Survival Estimate†	Recurrence Estimate†
Operative	194	-	-	-
Month 6	194	0	100.0%	0.0%
Year 1	193	0	100.0%	0.0%
Year 2	190	0	100.0%	0.0%
Year 3	183	1	99.4%	0.6%
Year 4	172	3	98.3%	1.7%
Year 5	146	6	95.7%	4.3%
*N start: number of patients at the beginning of the follow-up time interval. †Kaplan-Meier (product-limit) estimate with 1-sided 95% CI upper bound (UB).				

1686596 - Evolving Economics: The Erosion of Medicare Reimbursement in Breast Surgery (2003-2023)

Terry Gao[1], Kristen Hosang[1], Dianelys Tabla Cendra[1], Richard Bleicher[2], Lindsay Kuo[1], Austin Williams[2]

[1]Temple University Hospital, Philadelphia, PA, [2]Fox Chase Cancer Center, Philadelphia, PA

Background/Objective: Medicare, a primary determinant of reimbursement rates for medical services, often establishes a pricing standard that influences private insurance policies. While numerous medical specialties have experienced diminishing Medicare reimbursement rates, the magnitude of these trends has not been examined in breast surgery. This study investigates Medicare reimbursement trends for breast surgery operations.

Methods: Data on 10 breast operations was obtained from the Medicare Physician Fee Schedule Look-Up Tool from 2003 to 2023 using corresponding CPT codes (Table 1). Data extraction for sentinel lymph node biopsy injection began in 2011, the year in which its CPT code came into effect. CMS annually calculates each operation's relative value units (RVU) and a conversion factor (CF). Yearly Medicare reimbursement was calculated by multiplying operation-specific RVUs by the CF. The year-to-year percentage change in Medicare reimbursement was computed for each operation. The overall median change was determined and compared to changes in the Consumer Price Index (CPI) from the US Bureau of Labor Statistics to evaluate the relationship between Medicare compensation and inflation. All data were then adjusted for inflation by correcting all monetary data to 2023 dollars. The compound annual growth rate (CAGR) was then calculated using inflation-adjusted data. Using projected 2023 breast cancer incidence, we estimated the real-world deficit in reimbursement according to these findings.

Results: Over the study period, the median unadjusted percent change for the 10 breast operations was +22.31% (IQR 6.69% to 26.95%). During this period, the CPI increased by 69.15% ($p<.001$). After adjusting for inflation, the reimbursement rate for all operations experienced a median decline of 24.28% (IQR -25.81% to -23.11%). From 2003 to 2023, two queried operations (lumpectomy and simple mastectomy) saw increases in inflation-adjusted Medicare reimbursement (+0.37%, and +3.58%, respectively). During this time, the adjusted reimbursement rates for all 10 operations demonstrated a negative median annual growth rate of 1.54% (IQR -2.17% to -1.31%), indicating a steady year-to-year decline in reimbursement rate after adjusting for inflation. Notably, the same two operations (lumpectomy and simple mastectomy) maintained a positive annual growth rate during this time (+0.02% and +0.18%, respectively). Assuming that 10% of patients present with Stage 4 disease (for whom surgery is not indicated), 50% of patients undergo breast conservation, 50% of patients undergo mastectomy, and 80% undergo axillary surgery, we estimate that breast surgeons will be reimbursed $111,469,311.65 less for these surgeries in 2023 than if rates had kept pace with inflation over the past 10 years.

Conclusions: Inflation-adjusted Medicare reimbursement rates for breast surgeries have declined from 2003 to 2023, and the estimated real-world deficit is immense. This downward trend, if left unaddressed, carries profound implications. Diminishing reimbursement rates may strain resources, potentially leading to staffing shortages and compromises in care quality. Surgeons, healthcare administrators, and policymakers must confront these impending challenges with proactive measures to mitigate these issues. Understanding reimbursement trends and their impacts provides the foundation for advocating for equitable policies and solutions, which are essential to ensure the accessibility and quality of breast surgery in the future.

Table 1: Reimbursement trends in breast surgery from 2003 to 2023

CPT Code	Procedure	Unadjusted % Change in Reimbursement	Adjusted % Change in Reimbursement	Adjusted CAGR (%)*
19100	Percutaneous needle core biopsy of breast	+5.16	-36.41	-2.24
19101	Open incisional breast biopsy	+19.05	-28.01	-1.63
19120	Open excisional breast biopsy	+27.52	-22.89	-1.29
19301	Lumpectomy for malignancy	+65.99	+0.37	+0.02
38525	Biopsy/removal, lymph nodes	+2.42	-24.30	-2.29
38900	Sentinel lymph node biopsy, injection**	+0.14	-25.99	-2.48
19302	Lumpectomy w/axillary dissection	+11.28	-23.76	-1.96
19303	Simple mastectomy	+71.30	+3.58	+0.18
19305	Radical mastectomy	+23.57	-25.28	-1.45
19307	Modified radical mastectomy	+25.25	-24.27	-1.38

* Compound annual growth rate (CAGR); a single, consistent percentage representing the average annual growth or decline of reimbursement over a specified period.
** % changes from 2011 to 2023

1683643 - Residual Nodal Burden After Neoadjuvant Chemotherapy in cN1 Breast Cancer with Positive Nodes on Targeted Axillary Dissection

Alexandra Moore, Kelly Hunt, Henry Kuerer, Abigail Caudle, Susie Sun, Vicente Valero, Wei Yang, Benjamin Smith, Mediget Teshome

University of Texas MD Anderson Cancer Center, Houston, TX

Background/Objective: Targeted axillary dissection (TAD) is increasingly employed for staging in clinically node-positive breast cancer following neoadjuvant chemotherapy (NCT). Negative TAD (ypN0) facilitates de-escalation with omission of axillary node dissection (ALND) without compromising oncologic outcomes. However, for patients with a positive TAD, completion dissection (cALND) remains the standard of care. Despite this, there has been an observed trend toward omission of ALND in all populations. This study investigates the incidence and factors associated with additional positive nodal metastases on cALND in patients with positive TAD.

Methods: A retrospective review of a prospective institutional database was performed to identify cN1 breast cancer patients treated with NCT and TAD from July 2013-June 2023. cN1 status was defined by nodal ultrasound (US) with positive biopsy. Patients were excluded if they had negative TAD or had positive TAD but did not receive cALND. Patient, tumor, and treatment characteristics were evaluated and compared based on status of additional disease on cALND. Multivariate analysis was performed to identify factors associated with additional disease on cALND.

Results: 902 patients underwent TAD with negative TAD in 348 patients (38.6%) and positive TAD in 554 (61.4%). Among patients with positive TAD, 457 underwent cALND defining the study cohort. The majority of these patients were women (98.5%), white (61.1%), had ductal histology (93.2%), low clinical nodal burden at presentation (1-3 suspicious nodes by axillary US, 82.7%) and hormone receptor-positive HER2-negative subtype (72%) [Table 1]. On cALND, additional positive nodes were identified in 124 patients (27%) and no additional positive nodes in 333 (73%) of patients. Demographic characteristics including age, gender, race, tumor histology and biomarkers were not significantly different between the groups. For patients with residual disease on cALND, there were an average of 4.1 additional positive nodes retrieved. In comparison to those with no residual disease on cALND, these patients were more likely to have a larger primary tumor at diagnosis (median 4 vs 3.5cm, p=0.04), >3 suspicious nodes on axillary US at diagnosis (30% vs 13%, p=< 0.0001) and larger residual primary tumor on pathology (median 3 vs 2.1cm, p=0.0001). Conversely, those without additional positive nodes on cALND had tumors with a higher Ki-67 (median 30% vs 25%, p=0.02). On multivariate analysis, factors associated with patients having additional nodal disease on cALND included >3 suspicious nodes on initial axillary US (OR 3.4, p=< 0.0001) and larger residual primary tumor size (OR 1.2, p=0.004). Patients with higher Ki-67 were less likely to have additional positive nodes on cALND (OR 0.99, p=0.03).

Conclusions: In this population of breast cancer patients with cN1 disease and positive TAD after NCT, approximately 25% will have additional disease on cALND. Greater than 3 suspicious nodes on axillary US at diagnosis and larger residual tumor size after NCT remain significant predictors of residual nodal disease burden on cALND. As the overall trend in axillary staging continues toward de-escalation with selective omission of ALND when oncologically appropriate, these findings identify patient populations at highest risk of having significant residual nodal disease.

Table 1: Demographic, clinical, and pathological features for patients with cN1 breast cancer treated with neoadjuvant chemotherapy and with positive targeted axillary dissection

Variable	Overall population	cALND **without** additional disease (N=333)	cALND **with** additional disease (N=124)	p-value
Age, years				0.4
Median	50	50	51	
Mean (range)	52 (29-81)	52 (29-81)	53 (32-80)	
Gender				1.0*
Male	7 (1.5)	5 (1.5)	2 (1.6)	
Female	450 (98.5)	328 (98.5)	122 (98.4)	
Race				1.0*
White	279 (61.1)	203 (61)	76 (61.3)	
Black, Hispanic, Asian	178 (39)	130 (39)	48 (38.7)	
Size of tumor at diagnosis (cm)				0.04
Median	3.5	3.5	4	
Mean (range)	4.2 (0-18)	4.1 (0-18)	4.6 (1-12.9)	
Clinical T stage				0.3
Tis/T1	66 (14.4)	51 (15.3)	15 (12.1)	
T2	259 (56.7)	192 (57.7)	67 (54)	
T3/T4	132 (28.9)	90 (27)	42 (33.9)	
# Suspicious nodes on axillary US at diagnosis				<0.0001
1-3	378 (82.7)	291 (87.4)	87 (70.2)	
>3	79 (17.3)	42 (12.6)	37 (29.8)	
Histology				0.2*
Ductal	426 (93.2)	314 (94.3)	112 (90.3)	
Lobular	27 (5.9)	16 (4.8)	11 (8.9)	
Metaplastic	2 (0.4)	1 (0.3)	1 (0.8)	
mixed	2 (0.4)	2 (0.6)	0 (0)	
Tumor biomarkers				0.1*
HR+/HER2+	54 (11.8)	44 (13.2)	10 (8.1)	
HR+/HER2-	329 (72)	230 (69.1)	99 (79.8)	
HR-/HER2+	13 (2.8)	9 (2.7)	4 (3.2)	
HR-/HER2-	61 (13.4)	50 (15)	11 (8.9)	
Grade				0.06*^
G1	34 (7.5)	22 (6.7)	12 (9.8)	
G2	238 (52.4)	166 (50.2)	72 (58.5)	
G3	182 (40.1)	143 (43.2)	39 (31.7)	
Ki67 (%)				0.02~
Median	30	30	25	
Mean (range)	34.6 (1-100)	36.5 (1-100)	29.2 (1-90)	
Breast surgery				0.6
SM	209 (45.7)	155 (46.8)	54 (43.9)	
TM	245 (53.6)	176 (53.2)	69 (56.1)	
None	3 (0.7)			
Size of residual primary tumor on pathology (cm)				0.0001
Median	2.5	2.1	3	
Mean (range)	3.0 (0-14)	2.8 (0-13.3)	3.8 (0-14)	
Total # nodes removed				0.008
Median	20	20	22	
Mean (range)	21 (3-56)	21 (3-56)	23 (3-50)	

*fisher's exact test; ^ p value calculated after excluding "None"; ~Wilcoxon rank-sum test

1684259 - Diagnostic Delay Among Young Women with Breast Cancer

Katherine Fleshner, Flora Yang, Susan Isherwood, Yuan Xu, May Lynn Quan

University of Calgary, Calgary, AB, Canada

Background/Objective: Breast cancers in young women ≤ 40 represent only 5% of new cases each year in Canada, but often have worse outcomes compared to older women. It is not well-understood how young women with breast cancer initiate contact with care or what their diagnostic journey entails, therefore we aimed to describe the diagnostic timeline among a cohort of women ≤ 40 and identify predictors of diagnostic delay. We hypothesized that most young women with breast cancer will present with symptoms, and that there will be a significant delay to diagnosis due to patient factors.

Methods: Patients enrolled in the Reducing the Burden in Young Women with Breast Cancer (RUBY) study comprised our cohort. RUBY is a pan-Canadian study of over 1500 women ≤ 40 enrolled at the time of diagnosis and followed for 5 years. Multiple online surveys were distributed at the time of diagnosis. Patient-reported data including demographics, personal/family history, presenting symptoms, reasons for seeking care, timeline to diagnosis and perception of the process were captured. All subjects with completed surveys from 2015-2022 were included. Survey data were extracted and presented with descriptive statistics. A "patient delay" was considered > 4 weeks from onset of symptoms to first contact with the healthcare system, given that patients might wait a menstrual cycle to see whether their concerns would resolve. A "system delay" was considered > 3 weeks from time of presentation to care to time of first imaging test, based on Canadian Partnership Against Cancer guidelines. We then conducted a multivariate regression analysis to determine predictors of patient and system delay.

Results: A total of 1148 patients were included for analysis. Median age (IQR) was 37 (33.9, 39.0). Four hundred and twenty-three patients (36.8%) had a first-degree relative with cancer. A majority of patients (89.0%) had a symptom prompting assessment, the majority of which had a palpable mass (77.3%). Patients waited a median of 2 weeks before seeking care, and about one-third (364 patients) experienced a patient delay. Reasons for patient delay included lack of concern, waiting a menstrual cycle, reassurance by another practitioner, difficulty accessing care, and competing priorities. Only 10.1% experienced a system delay. On multivariable analysis, there were no independent predictors of system delay, but having a painful lump as the presenting symptom and having a first-degree relative with breast cancer were independent predictors of patient delay.

Conclusions: Young women with breast cancer often present with symptoms. Most undergo timely investigation; however, a significant proportion experience diagnostic delay, most often related to patient factors. Our findings align with the existing literature demonstrating significant patient delay and a higher incidence of delay in those with a positive family history, but, to the best of our knowledge, our study is the largest conducted to date and the first to report reasons for delay in young women. Our study emphasizes that more education is needed to raise awareness of concerning symptoms for patients and practitioners. Further research is also required to elucidate whether diagnostic delay in young women negatively impacts survival.

Table 1: Summary of key findings

Category		Frequency (%)
Age (median (IQR))		37.0 [33.8,39.0]
Marital Status	Divorced/Separated	50 (4.4)
	Married/Common Law	871 (75.9)
	Single	227 (19.8)
Highest Education Level	College or technical school	311 (27.1)
	High school diploma	138 (12.0)
	Post-Graduate degree	689 (60.0)
Occupation	Full-time	668 (58.2)
	Part-time	203 (17.7)
	Not working	277 (24.1)
Household Income, per year	Less than 25,000	50 (4.4)
	$25,000 to $75,000	267 (23.3)
	$75,000 to $150,000	459 (40.0)
	Greater than 150,000	250 (21.7)
	I do not wish to disclose	122 (10.6)
First Degree Relative with Cancer	Yes	423 (36.8)
	No	725 (63.2)
Comorbidities	1 or more comorbid conditions	654 (57.0)
	None	494 (43.0)
Breast Cancer Detection	Symptom	1022 (89.0)
	Incidental finding	7 (0.6)
	Routine breast examination	27 (2.4)
	Routine Screening	90 (7.8)
	Other	2 (0.2)
Symptoms Reported*	Painless Lump	516 (50.7)
	Painful Lump	208 (20.4)
	Breast Pain	36 (3.5)
	Nipple Discharge	27 (2.7)
	Skin Changes/Nipple Inversion	34 (3.3)
	Mutiple Symptoms	197 (19.4)
Number of Weeks Waited Before Seeking Care (median (IQR))		2.0 (1.0, 8.0)
	Patient Delay (>4 weeks)	364 (31.7)
Reasons for Patient Delay	I had difficulty accessing timely care	37 (3.6)

1662049 - Lymphedema Rates Following Axillary Lymph Node Dissection with and without Immediate Lymphatic Reconstruction: A Prospective Trial

James Jakub[1], Judy Boughey[2], Tina Hieken[2], Mara Piltin[2], Antonio Forte[1], Aparna Vijaysakaran[2], Jenna Sturz[2], Monica Mazur[1], Kimberly Corbin[2], Laura Vallow[1], Jeffrey Johnson[2], Mary Mrdutt[2], Vahe Fahradyan[2], Zhuo Li[1], Sophia Blumenfeld[1], Amy Degnim[2], Kathleen Yost[2], Andrea Cheville[2], Sarah McLaughlin[1]

[1]Mayo Clinic, Jacksonville, FL, [2]Mayo Clinic, Rochester, MN

Background/Objective: Although rates continue to decrease steadily, some patients with breast cancer still require axillary lymph node dissection (ALND). Immediate lymphatic reconstruction (ILR) has been proposed to decrease lymphedema rates. The primary aim of our study was to determine if ILR decreased the incidence of lymphedema in patients undergoing ALND.

Methods: Two-site pragmatic study of ALND with or without ILR, employing surgeon-level cohort assignment at the individual surgeon level, based on breast surgeon's preferred standard practice, similar to a 2-arm cluster-randomized design. Patients undergoing ALND between 2018-2022 were enrolled. Lymphedema was ascertained by 5 methods: Patient self-report, Provider EHR documentation, ICD-10 codes, Limb volume measurements (relative volume change of >5% and >10%) and Validated patient questionnaire. To control for baseline differences between the cohorts, a propensity score was calculated based on demographic and clinical variables, and was included as a covariate in multivariable models.

Results: 230 patients with breast cancer were enrolled; on an intention to treat basis, 99 underwent ALND and 131 ALND with ILR. Of the 131 patients preoperatively planned for ILR, 115 (87.8%) underwent ILR; 72 (62.6%) were performed by one breast surgical oncologist and 43 (37.4%) by fellowship trained microvascular plastic surgeons, with a median of 1.0 lymphatic-venous anastomosis per patient (range 1-6). Median patient age was 57.2. Clinical T category was ≥T2 in 168 (75.3%), 98 (42.6%) were pN2 or pN3 and 24 (10.5%) underwent ALND for recurrence. The median number of axillary LNs pathologically identified was 21 with a median of 2 positive. Median LN metastatic size was 1.0 cm and 114 (63%) exhibited extranodal extension. 179 (77.8%) patients received chemotherapy, 178 (77.4%) neoadjuvant systemic therapy (150 chemotherapy, 43 endocrine therapy and 15 both), and 208 (90.4%) adjuvant regional nodal irradiation. Patient self-reported freedom from lymphedema at 6, 12, 24, and 36 months was 81.7%, 69.8%, 64.4%, 60.2%, respectively and not statistically different between the 2 cohorts (Figure). Considering all patients and ascertainment strategies there was no significant difference between those undergoing ILR or not (p=0.28). Lymphedema rates when captured by ICD-10 codes alone were lower with ILR, in both the intent to treat (p=0.014) and treatment received cohort (p=0.028). We did not find a statistically significant difference in limb volume measurements between the two cohorts when a >5% limb volume change definition was used. ILR was associated with an increased risk of lymphedema when defined as >10% limb volume change on univariable analysis, but not on multivariable analysis after propensity score adjustment. Our results were consistent regardless of whether the ILR was performed by a breast or a microvascular-trained plastic surgeon.

Conclusions: We found no difference in lymphedema rates between patients undergoing ALND with or without ILR in a prospective trial utilizing multiple definitions of lymphedema, with the exception of decreased lymphedema rates with ILR defined by ICD-10 codes.

Figure 1.

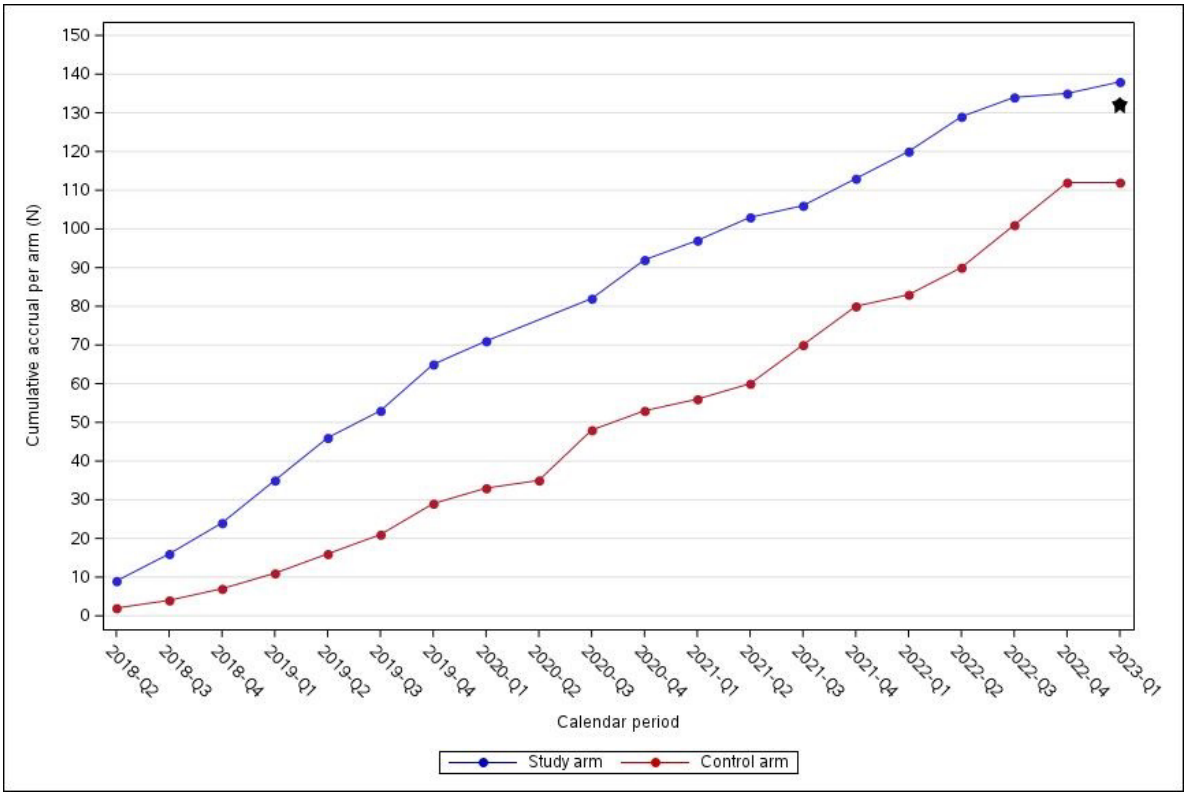
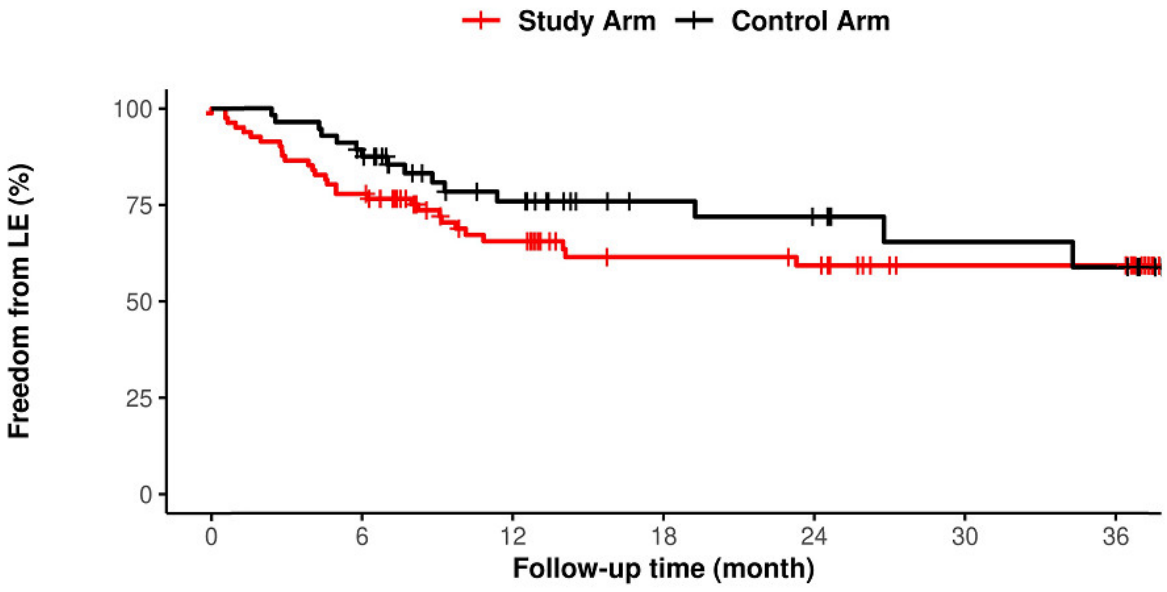


Figure 2: Freedom from lymphedema, patient self reporting



1675935 - Self-reported Management of Inflammatory Breast Cancer Among the American Society of Breast Surgeons Membership: Consensus and Opportunities

Alexa Glencer, Kerollos Wanis, Sarah DeSnyder, Anthony Lucci, Taiwo Adesoye, Susie Sun, Kelly Hunt, Mediget Teshome

University of Texas MD Anderson Cancer Center, Houston, TX

Background/Objective: Inflammatory breast cancer (IBC) is rare and biologically aggressive with worse prognosis compared to non-IBC. Standard of care treatment consists of trimodality therapy without current evidence to guide de-escalation strategies. The objective of this study was to assess management strategies among American Society of Breast Surgeons (ASBrS) members and identify areas of consensus and debate.

Methods: An anonymous survey was distributed to ASBrS members from March-May 2023. Demographic information was obtained and questions asked related to clinical experience and management of stage III and IV IBC. Agreement was defined as a shared response by >80% of respondents. Responses for areas of disagreement were stratified by years in practice, fellowship training, and estimated annual IBC patient volume (low 0-5, high >5). Fisher's exact test was used to calculate associations among these variables.

Results: The survey was administered to 2337 members with 465 (19.8%) respondents. 399 (17.1%) completed all questions and defined the study cohort. Distribution of years in practice was 26.0% 0-10 years, 26.6% 11-20 years, and 47.4% >20 years. 51.2% reported surgical oncology or breast fellowship training, 69.2% maintain a breast-only practice, and 73.5% estimated treating 0-5 IBC cases/year. Agreement was identified in the work-up of suspected IBC with mammogram (97.5%), ultrasound (breast 79.4%, ipsilateral axilla 89.0%) and PET or CT chest/abdomen/pelvis with bone scan (89.5%). Regarding management of stage III IBC, 99% endorsed trimodality therapy (neoadjuvant chemotherapy, surgery, radiation) and 82% perform total mastectomy for the breast primary. Agreement was also observed for management of cN3 IBC with axillary lymph node dissection (ALND) +/- level III (82.5%) and definitive radiation of supraclavicular nodes regardless of chemotherapy response (favorable 84.5%, non-favorable 95.5%). Lack of agreement was observed in routine use of contralateral axillary ultrasound, skin punch biopsy, medical photography, surgical management of the axilla in cN0 and cN1-2, reconstruction timing, contralateral prophylactic mastectomy (CPM), and routine use of axillary reverse mapping/ lymphedema prevention surgery (Table 1). Years in practice and fellowship training were associated with differences in axillary management such that respondents with < 10 years in practice and those with fellowship training were more likely to perform routine ALND for cN0-N3 stage III IBC. No significant associations were observed comparing IBC annual volume. When surgery is considered for de novo stage IV IBC, 57.1% of respondents reported routinely performing total mastectomy and 29.1% ALND (+/- level III). Management of stage IV disease with isolated contralateral axillary metastasis was varied (20.3% ALND, 39.8% sentinel lymph node/targeted axillary dissection, 15.8% radiation alone, 24.1% no local therapy).

Conclusions: Among ASBrS members, there is consensus in the clinical evaluation, treatment sequencing, surgical approach for the breast primary, and local-regional approaches to cN3 disease in stage III IBC. However, differences exist in reported surgical management of the axilla with uptake of de-escalation strategies particularly among surgeons with >10 years in practice and without fellowship training. Lack of consensus was observed in local-regional management of stage IV IBC. Further research is needed to understand trends in treatment and associated oncologic outcomes in this high-risk population.

Table 1: Respondent answers to ASBrS IBC survey questions pertaining to management of Stage III IBC, categorized by years in practice, fellowship training, and annual volume of IBC patients. Topics included refer to questions in which less than 80% of respondents agreed in their answer.

Variable	Overall	Years in Practice				Fellowship Training			IBC Annual Volume		
		0-10	11-20	>20	p-value	Yes	No	p-value	0-5 pts	>5 pts	p-value
Initial Work Up: Contralateral Axillary Ultrasound											
All IBC Patients	58 (14.5%)	10 (9.6%)	18 (17.0%)	30 (15.9%)	0.232	31 (15.2%)	27 (13.8%)	0.653	41 (14.0%)	17(16.0%)	0.876
Select IBC Patients	224(56.1%)	69 (66.3%)	59 (55.7%)	96 (50.8%)		110(53.9%)	114(58.5%)		163(55.6%)	61(57.5%)	
Not Performed for IBC Patients	107(26.8%)	22 (21.2%)	27 (25.5%)	58 (30.7%)		59 (28.9%)	48 (24.6%)		81 (27.6%)	26(24.5%)	
Unsure	10 (2.51%)	3 (2.9%)	2 (1.9%)	5 (2.6%)		4 (2.0%)	6 (3.1%)		8 (2.7%)	2 (1.9%)	
Medical Photography											
All IBC Patients	124(31.1%)	39 (37.5%)	34 (32.1%)	51 (27.0%)	0.149	76 (37.3%)	48 (24.6%)	**0.036**	85 (29.0%)	39(36.8%)	0.07
Select IBC Patients	146(36.6%)	36 (34.6%)	44 (41.5%)	66 (34.9%)		72 (35.3%)	74 (37.9%)		104(35.5%)	42(39.6%)	
Not Performed for IBC Patients	94 (23.5%)	22 (21.2%)	17 (16.0%)	55 (29.1%)		40 (19.6%)	54 (27.7%)		73 (24.9%)	21(19.8%)	
Unsure	35 (8.8%)	7 (6.7%)	11 (10.4%)	17 (9.0%)		16 (7.8%)	19 (9.7%)		31 (10.6%)	4 (3.8%)	
Skin Punch Biopsy											
All IBC Patients	172(43.1%)	36 (34.6%)	42 (39.6%)	94 (49.7%)	**0.01**	76 (37.3%)	96 (49.2%)	**0.023**	140(47.8%)	32(30.2%)	**<0.001**
Select IBC Patients	198(49.6%)	64 (61.5%)	57 (53.8%)	77 (40.7%)		115(56.4%)	83 (42.6%)		140(47.8%)	58(54.7%)	
Not Performed for IBC Patients	29 (7.3%)	4 (3.8%)	7 (6.6%)	18 (9.5%)		13 (6.4%)	16 (8.2%)		13 (4.4%)	16(15.1%)	
Management of cN0 Axilla											
None	6 (1.5%)	0	1 (0.9%)	5 (2.6%)	**0.026**	2 (1.0%)	4 (2.1%)	**0.005**	3 (1.0%)	3 (2.8%)	0.158
SLND	140(35.1%)	27(26.0%)	35(33.0%)	78 (41.3%)		57 (27.9%)	83(42.6%)		110(37.5%)	30(28.3%)	
ALND	253(63.4%)	77 (74.0%)	70 (66.0%)	106(56.1%)		145(71.1%)	108(55.4%)		180(61.5%)	73(68.9%)	
Management of cN1-2 Axilla											
None	1 (0.3%)	0	0	1 (0.5%)	**0.033**	0	1 (0.5%)	0.057	1 (0.3%)	0	0.682
SLND	12 (3.0%)	1 (1.0%)	2 (1.9%)	9 (4.8%)		3 (1.5%)	9 (4.6%)		10 (3.4%)	2 (1.9%)	
TAD	107(26.8%)	18 (17.3%)	32 (30.2%)	57 (30.2%)		48 (23.5%)	59 (30.3%)		80 (27.3%)	27(25.5%)	
ALND (level I and II)	269(67.4%)	83 (79.8%)	71 (67.0%)	115(60.8%)		149(73.0%)	120(61.5%)		193(65.9%)	76(71.7%)	
ALND (level I, II and III)	10 (2.5%)	2 (1.9%)	1 (0.9%)	7 (3.7%)		4 (2.0%)	6 (3.1%)		9 (3.1%)	1 (0.9%)	
Post-mastectomy Reconstruction											
Not offered at anytime	10 (2.5%)	3 (2.9%)	1 (0.9%)	6 (3.2%)	0.716	4 (2.0%)	6 (3.1%)	0.511	9 (3.1%)	1 (0.9%)	0.664
Delayed for all cases	266(66.7%)	73 (70.2%)	74 (69.8%)	119(63.0%)		139(68.1%)	127(65.1%)		196(66.9%)	70(66.0%)	
Immediate in selected cases	67 (16.8%)	14 (13.5%)	15 (14.2%)	38 (20.1%)		37 (18.1%)	30 (15.4%)		49 (16.7%)	18(17.0%)	
Defer to plastic surgeon	49 (12.3%)	13 (12.5%)	13 (12.3%)	23 (12.2%)		20 (9.8%)	29 (14.9%)		35 (11.9%)	14(13.2%)	
None of above	7 (1.7%)	1 (1.0%)	3 (2.8%)	3 (1.6%)		4 (2.0%)	3 (1.5%)		4 (1.4%)	3 (2.8%)	
CPM at initial operation											
Discourage for all	34 (8.5%)	8 (7.7%)	4 (3.8%)	22 (11.6%)	0.055	16 (7.8%)	18 (9.2%)	0.248	25 (8.5%)	9 (8.5%)	0.072
Offer if genetic predisposition	74 (18.5%)	21 (20.2%)	23 (21.7%)	30 (15.9%)		37 (18.1%)	37 (19.0%)		60 (20.5%)	14(13.2%)	
Offer in selected cases without genetic predisposition	19 (4.8%)	2 (1.9%)	5 (4.7%)	12 (6.3%)		8 (3.9%)	11 (5.6%)		16 (5.5%)	3 (2.8%)	
Discourage, offer delayed in selected cases	185(46.4%)	44 (42.3%)	50 (47.2%)	91 (48.1%)		104(51.0%)	81 (41.5%)		125(42.7%)	60(56.6%)	
Discourage, offer delayed for all	36 (9.0%)	12 (11.5%)	10 (9.4%)	14 (7.4%)		20 (9.8%)	16 (8.2%)		26 (8.9%)	10 (9.4%)	
Offer to all patients	42 (10.5%)	15 (14.4%)	14 (13.2%)	13 (6.9%)		17 (8.3%)	25 (12.8%)		36 (12.3%)	6 (5.7%)	
None of Above	9 (2.3%)	2 (1.9%)	0	7 (3.7%)		2 (1.0%)	7 (3.6%)		5 (1.7%)	4 (3.8%)	
Axillary Reverse Mapping & LVB											
No	229(57.4%)	53 (51.0%)	58 (54.7%)	118(62.4%)	0.247	107(52.5%)	122(62.6%)	0.064	168(57.3%)	61(57.5%)	0.891
Yes – Selective	57 (14.3%)	14 (13.5%)	17 (16.0%)	26 (13.8%)		37 (18.1%)	20 (10.3%)		40 (13.7%)	17(16.0%)	
Yes – All patients	71 (17.8%)	25 (24.0%)	20 (18.9%)	26 (13.8%)		41 (20.1%)	30 (15.4%)		52 (17.7%)	19(17.9%)	
Refer to plastics for delayed management if needed	35 (8.8%)	12 (11.5%)	9 (8.5%)	14 (7.4%)		17 (8.3%)	18 (9.2%)		28 (9.6%)	7 (6.6%)	
None of Above	7 (1.7%)	0	2 (1.9%)	5 (2.6%)		2 (1.0%)	5 (2.6%)		5 (1.7%)	2 (1.9%)	

1678051 - The Role of Clipping the Lymph Node in Clinically Node-positive Patients Treated with Neoadjuvant Chemotherapy for Breast Cancer: Impact on Axillary Surgery in the ISPY-2 Clinical Trial

Kayla Switalla[1], Judy Boughey[2], Katrina Dimitroff[1], Christina Yau[1], Velle Ladores[3], Hongmei Yu[4], Mehra Golshan[5], Gretchen Ahrendt[6], Mara Piltin[2], Anne Wallace[7], Cletus Arciero[8], Marissa Howard-McNatt[9], Jennifer Son[10], Chantal Reyna[11], Todd Tuttle[12], Marie Lee[13], Julia Tchou[14], Roshni Rao[15], Emilia Diego[16], Sheldon Feldman[17], Nora Jaskowiak[18], Arpana Naik[19], Rachael Lancaster[20], Lauren Postlewait[21], Ian Greenwalt[22], Kelly Hewitt[23], Candice Sauder[24], Jennifer Tseng[25], Ayemoethu Ma[26], Peter Norwood[5], Laura Esserman[1], ISPY2 Locoregional Working Group[1], Rita Mukhtar[1]

[1]University of California - San Francisco, San Francisco, CA, [2]Mayo Clinic, Rochester, MN, [3]Breast Care Center, UCSF Health, San Francisco, CA, [4]Quantum Leap Healthcare Collaborative, San Francisco, CA, [5]Yale University, New Haven, CT, [6]University of Colorado Aurora, CO, [7]University of California San Diego Health, San Diego, CA, [8]Emory University Hospital, Atlanta, GA, [9]Wake Forest Baptist Health, Winston-Salem, NC, [10]MedStar Georgetown University Hospital, Washington, DC, [11]Loyola Medicine, Maywood, IL, [12]University of Minnesota, Minneapolis, MN, [13]H. Lee Moffitt Cancer Center, Tampa, FL, [14]University of Pennsylvania, Philadelphia, PA, [15]Columbia University Vagelos College of Physicians and Surgeons, New York, NY, [16]University of Pittsburgh, Pittsburgh, PA, [17]Montefiore Medical Center, Bronx, NY, [18]University of Chicago, Chicago, IL, [19]Oregon Health & Science University, Portland, OR, [20]University of Alabama at Birmingham, Birmingham, AL, [21]Emory University School of Medicine, Atlanta, GA, [22]MedStar Georgetown University Hospital, Washington, DC, [23]Vanderbilt University Medical Center, Nashville, TN, [24]UC Davis Health Comprehensive Cancer Center, Sacramento, CA, [25]City of Hope Orange County, Irvine, CA, [26]UCSF East Bay, Highland Hospital Oncology, Oakland, CA

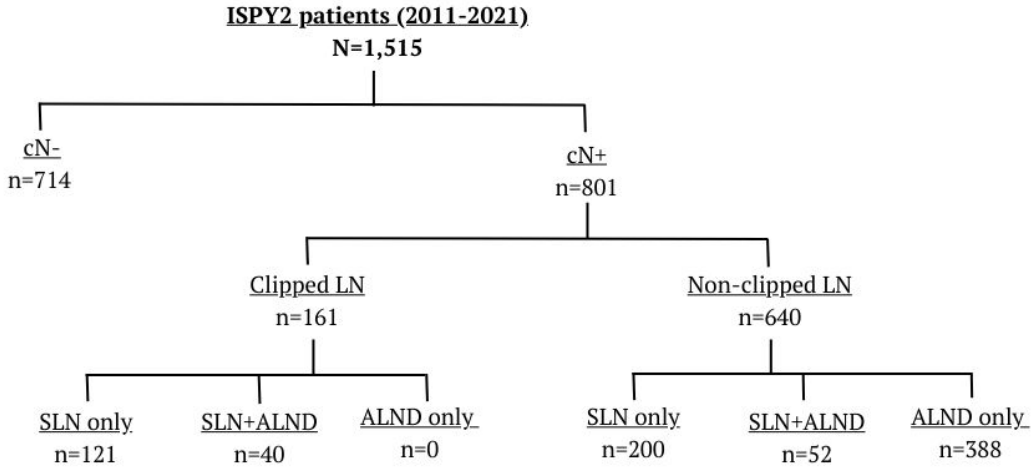
Background/Objective: For patients with clinically node-positive (cN+) breast cancer treated with neoadjuvant chemotherapy (NAC), retrieval of the previously clipped, biopsy-proven positive lymph node during axillary surgery may reduce false negative rates (FNR). However, there are mixed results regarding the benefits of routinely clipping biopsy-proven positive nodes. This study evaluated the relationship between clipping nodes, axillary surgery, and false negative rates (FNR) in cN+ patients on a NAC trial.

Methods: We retrospectively analyzed cN+ ISPY-2 patients (2011-2022) who underwent sentinel lymph node surgery (SLN)-only, SLN and axillary dissection (ALND), or ALND-only after NAC. We compared patients with and without placement of a clip in the biopsy-proven positive lymph node, evaluating rates of clip placement, type of axillary surgery, clip localization and retrieval rates, number of nodes removed, and FNR.

Results: Of 1,515 ISPY-2 patients, 801 (52.9%) were cN+, with 161 patients (20.1%) having a clip placed in the biopsy-proven positive node prior to NAC. The percentage of cN+ clipped node patients increased from 2.4% to 36.2% from 2011 to 2021. Axillary surgery included SLN-only (40.1%), SLN and ALND (11.5%), and ALND-only (48.4%). Clipped node patients were significantly less likely to undergo ALND-only compared to non-clipped node patients (0% vs 60.6%, $p< 0.001$) and more likely to undergo SLN-only surgery (75.1% vs 31.2%, $p< 0.001$). When adjusted for year of surgery, multivariable logistic regression showed that clipped nodes were independently associated with higher odds of SLN only surgery (OR 4.9, 95% CI 3.2-7.4, $p< 0.001$). In the SLN-only cohort (n=321), the average number of nodes removed did not differ between clipped (n=121) and non-clipped node (n=200) patients (4.2 vs 4.1, p=0.9). However, clipped node patients undergoing SLN-only and clip localization had more lymph nodes removed compared to those without localization (4.6 vs 3.4, p=0.04). Of the 161 patients with clipped nodes, clip localization and retrieval status were available in 147. Clip localization was associated with a higher rate of clipped node retrieval than without localization (104/108, 96% vs. 22/39, 56%, $p< 0.001$). Retrieval rates of clipped nodes did not differ by localization method (MagSeed: 25/25, 100% vs. Radioactive Seed: 29/30, 97% vs. Savi Scout 32/33, 97% vs. wire 18/20, 90%, p=0.356). In cN+ patients who underwent SLN and ALND, the FNR for SLN surgery was 9.4% (95% CI: 0.4-18%) in those with clipped nodes (n=40) and 12.8% (95% CI: 4-22%) in those without clipped nodes (n=52), which did not differ statistically (p=0.603).

Conclusions: Utilization of lymph node clipping among patients with cN+ breast cancer has increased over the last decade. Patients with clipped nodes are more likely to undergo SLN-only, independent of surgery year. In patients who underwent both SLN and ALND, clipped and non-clipped node patients showed comparable FNRs. These results suggest that clipping and localizing the biopsy-proven positive lymph node may facilitate a potential pathway towards less invasive axillary surgery.

Figure 1: Patient distribution by group



Saturday, April 29, 2023, 2:00 pm – 3:00 pm Moderators: Julia Tchou, MD, PhD, FACS; Mediget Teshome, MD, MPH, FACS

1680027 - Presentation and Management of Granulomatous Mastitis in the United States: Results of an American Society of Breast Surgeons Registry Study

Nimmi Kapoor[1], Howon Ryu[2], Linda Smith[3], Jingjing Zhou[2], Katrina Mitchell[4], Sarah Blair[2]

[1]UCLA Medical Center - Los Angeles, Woodland Hills, CA, [2]UCSD, San Diego, CA, [3]Xraynm, Albuquerque, NM, [4]Ridley-Tree Cancer Center, Santa Barbara, CA

Background/Objective: Granulomatous lobular mastitis (GLM), also referred to as idiopathic granulomatous mastitis, is an uncommon, benign, often chronic inflammatory disease that traditionally was managed with surgery; however, medical management of GLM has become more frequent. The purpose of this American Society of Breast Surgeons (ASBrS) prospective, multi-site registry study was to examine clinical outcomes of GLM and to identify treatments associated with the shortest time to improvement of symptoms.

Methods: Members of the ASBrS entered prospective data into a registry created in the Mastery of Breast Surgery□ database. Data on patient demographics, disease severity, method of diagnosis, and bacterial cultures was collected. Initial and on-going treatment and symptoms at 1, 3, 6, and 12 months was recorded. Symptom severity was graded as follows: mild, involving < 10% of the breast; moderate, involving 10-25% of the breast; or, severe, involving >25% of the breast. Medical intervention included use of non-steroidal anti-inflammatories, antibiotics, steroids and other immune-modulating agents, and topical medications. Surgical intervention included needle aspiration, incision and drainage, and excision. Chi-square and Fischer exact tests were used to identify variables associated with improvement or resolution of symptoms (I/R) compared to patients with worsening or stable symptoms (W/S) and logistic regression analysis was used to identify treatments associated with fastest I/R of symptoms.

Results: 107 patients entered by 45 surgeons had sufficient data for inclusion. Mean patient age was 36, most were either Hispanic (47.7%) or Caucasian (22.4%), and more were from the Southwest (39.3%). Bacterial cultures were sent on 59 patients and 26 (44%) showed bacterial growth. Treatment interventions included medical (72%), surgical (5.6%), or a combination (17.8%); five patients underwent observation alone (4.7%). Steroid treatment was used for 79 patients, including 40 who received intralesional steroid injections. Patients who presented with severe symptoms were more likely to undergo initial surgical intervention compared to those with mild or moderate symptoms (22.2% vs 5%, p=0.006). Within the registry, 57.5% of patients had a change in treatment. 81 patients (75.7%) experienced I/R without further relapse at follow up of 1 month (n=29, 35.8%), 3 months (n=21, 25.9%), 6 months (n=19, 23.4%), or 12 months (n=12, 14.8%). On univariate analysis, patients with I/R were slightly older than patients with W/S symptoms, (36.9 vs 33.1 years, p=0.045); however, no other variables were associated with I/R including patient race, demographic, disease severity, positive bacterial culture, or treatment. On logistic regression, patients with I/R within one month were more likely to receive steroid treatment initially than those without I/R by one month (p=0.036).

Conclusions: This ASBrS registry study captures a broad spectrum of GLM across the United States. Most patients are in their 30s and Hispanic or Caucasian. The disease has a protracted course and treatment with steroids appears to be most beneficial. Within the timeframe of this registry, 75.8% of patients experienced I/R of symptoms by one year and 27.1% achieved this in one month. This data can help guide surgeons in treatment recommendations for this benign inflammatory breast disease.

Table 1: Symptom severity of granulomatous mastitis and initial intervention

	Overall	Observation	Medical (Non-Steroid)	Steroid	Surgical	p
N	107	14	41	42	10	
Extent* (%)						0.006
Mild	30 (28.0)	8 (57.1)	14 (34.1)	8 (19.0)	0 (0.0)	
Moderate	50 (46.7)	6 (42.9)	18 (43.9)	22 (52.4)	4 (40.0)	
Severe	27 (25.2)	0 (0.0)	9 (22.0)	12 (28.6)	6 (60.0)	

*Extent: Mild: <10% of the breast involved; Moderate: 10-25% of the breast involved; Severe: >25% of the breast involved

1685691 - Surveillance Strategies After Primary Treatment for Patients with Invasive Lobular Carcinoma of the Breast: Method of Local Recurrence Detection After Breast-conserving Surgery

Elle Clelland[1], Firdows Mujir[2], Astrid Quirarte[2], Harriet Rothschild[2], Helena Record[2], Mandeep Kaur[2], Rita Mukhtar[2]

[1]University of California, San Francisco, Loomis, CA, [2]University of California, San Francisco, CA

Background/Objective: Invasive lobular carcinoma (ILC) is the second most common histological subtype of breast cancer after invasive ductal carcinoma (IDC). Many studies have shown that standard imaging techniques have lower sensitivity for detecting ILC, a diffusely growing tumor type. Despite this, there are no data to guide the optimal surveillance technique after completion of primary treatment specifically in ILC. We aimed to characterize the sensitivity of various surveillance strategies for the detection of recurrence in patients who underwent treatment for primary ILC.

Methods: With institutional review board approval, we retrospectively analyzed a well-characterized prospectively maintained institutional ILC database to identify all cases of recurrence after primary treatment for stage I-III ILC. In this analysis, we specifically evaluated surveillance strategies and mode of recurrence detection for patients who had local recurrence after undergoing breast conserving surgery (BCS) for ILC.

Results: From an institutional database of 813 women with ILC, we identified 120 patients with a recurrence event. Of these cases, 38 (31.7%) had a local recurrence, 61 (50.8%) had a distant recurrence, and 21 (17.5%) had both a local and distant recurrence. In the 118 cases with surgery type available in this cohort, 50% had BCS, and 50% underwent mastectomy, with no difference in type of recurrence. Among those who underwent BCS, the surveillance strategy included mammography in 71.4%, breast MRI with or without mammography in 21.4%, and physical examination only in 7.1%. The imaging surveillance method (mammogram versus breast MRI) was associated with significantly different local recurrence detection rates ($p < 0.001$). For BCS patients having mammographic surveillance, 42.1% of local recurrences were found on mammography, with the remaining 57.9% found on palpation. For patients having MRI surveillance, 66.7% of local recurrences were found on MRI, compared to 33% found on palpation. In patients with no imaging surveillance, all local recurrences were found on palpation. For BCS patients with local recurrence detected by mammography, 71.4% had a mammogram in the prior year, while none had a breast MRI in the prior year. For local recurrences detected by MRI, 40% had a mammogram in the prior year, and 40% had a breast MRI in the prior year. Of the cases that presented as palpable findings, 50% had a mammogram within the prior year and none had an MRI.

Conclusions: In this study of patients with recurrence after primary treatment for stage I-III ILC, we found variations in surveillance strategies and differences in rates of imaging-detected recurrence by imaging modality. Breast MRI was associated with significantly higher rates of imaging-detected recurrence compared to mammography. Interestingly, a high proportion of recurrences were detected by physical examination, despite concerns about the non-palpable nature of ILC. In this group, 50% had a mammogram within the prior year, suggesting relatively low sensitivity of routine mammography. Although a small cohort, these data potentially support the use of breast MRI for surveillance after BCS for ILC. Future data will examine the timing of recurrence and the impact of imaging strategy on long-term outcomes.

1685824 – Real-world Implications of the SOUND Trial

Andreas Giannakou[1], Olga Kantor[2], Ko Park[2], Laura Dominici[2], Faina Nakhlis[2], Elizabeth Mittendorf[2], Tari King[2]

[1]MGH/BWH/DFCI, Everett, MA, [2]Brigham and Women's Hospital, Boston, MA

Background/Objective: The SOUND trial randomized patients with cT1N0 breast cancer and negative axillary ultrasound (AxUS) to sentinel lymph node biopsy (SLNB) or no surgical staging and demonstrated that omission of SLNB is noninferior to SLNB for oncologic safety. While the SOUND trial included all breast cancer subtypes, to begin to examine the generalizability of these clinical trial results in real world practice, we chose to examine nodal disease burden and oncologic outcomes among cT1N0 HR+ HER2- negative breast cancer patients who would have been eligible for the SOUND trial.

Methods: Patients with cT1N0M0, HR+HER2- breast cancer and negative preoperative AxUS or an isolated abnormal lymph node with negative preoperative biopsy (SOUND eligibility criteria), who underwent upfront surgery including SLNB from 2015-2022 were identified. Patient and tumor characteristics, disease burden, adjuvant treatment and oncologic outcomes were examined.

Results: Of 3938 patients with cT1N0M0 HR+HER2- breast cancer, 550 (13.9%) underwent AxUS, of which 510 (92.7%) met SOUND eligibility criteria. Compared to patients without preoperative AxUS, patients undergoing AxUS were younger (median age 59 vs 63 yrs, p=0.001), had higher grade tumors (p< 0.001) and were more likely to undergo mastectomy (20% vs 13.2%, p< 0.001). Oncologic outcomes at 3yrs including locoregional recurrence (LRR), distant recurrence (DR), invasive disease-free survival (iDFS) and overall survival (OS) were not different between patients with and without AxUS. Of the 510 patients meeting SOUND criteria, SLNB was omitted in 98 (19.2%), failed in one and was completed in 411 (80.5%). Clinical and pathologic characteristics, overall nodal disease burden and recurrence rates for "SOUND eligible" patients and the published SOUND population (SLNB arm) were similar. (Table 1) However, it should be noted that our institutional cohort was limited to HR+HER2- patients, median follow up was shorter (26.3 vs 69.6 months) and there were fewer postmenopausal patients (57.4% vs 78.8%). Among "SOUND eligible" patients, median age was 56 yrs (22 – 80yrs), median tumor size was 1.3 cm and the majority had grade 1 or 2 disease (n=336, 81.7%). Lumpectomy was performed in 312 (75.9%) patients, of whom 276 (88.5%) received whole breast radiation. At least one positive SLN was found in 59 (14.3%) patients. Of those with positive nodes, 15 (25.4%) patients underwent axillary dissection with additional nodal disease found in 9 (15.2%). At a median follow-up of 26.3 months (0.3 – 84.4 months) there were 3 (0.7%) local recurrences, 3 (0.7%) regional recurrences, 4 (1.0%) distant recurrences and 3 (0.7%) deaths. 3-yr rates of LRR were 0.0%, DR 0.9%, iDFS 98.4% and OS 100%.

Conclusions: Examination of our real-world cT1N0 HR+ HER2- "SOUND eligible" population suggests that nodal disease burden and oncologic outcomes are similar; providing support for careful implementation of these clinical trial results into multi-disciplinary clinical practice. Further investigation to determine the potential impact of omission of surgical axillary staging on adjuvant therapy recommendations in the era of evolving precision medicine is underway.

Table 1: Clinico-pathologic characteristics and outcomes among SOUND eligible patients

Characteristics	Patients, No (%) HR+HER- SOUND eligible with SLNB (n= 411)		SOUND population randomized to SLNB (n=708)	
Age at surgery (yrs)				
<40	33	8.0%	10	1.4%
40-49	102	24.8%	114	16.1%
50-65	188	45.7%	324	45.8%
≥65	88	21.4%	260	36.7%
Median (IQR) age	55.5	(46-53)	60	(52-68)
Menopausal status				
Premenopausal	167	40.6%	145	20.5%
Postmenopausal	236	57.4%	558	78.8%
Unknown	8	1.9%		
Histology				
Ductal	272	66.2%	551	77.8%
Lobular	56	13.6%	61	8.6%
Other	83	20.2%	96	13.6%
Pathologic tumor size				
pT1a	19	4.6%	71	10.0%
pT1b	97	23.6%	251	35.5%
pT1c	239	58.2%	355	50.1%
pT2	50	12.2%	31	4.4%
pT3	6	1.5%	0	0.0%
Median (IQR) tumor size (cm)	1.3	(0.8-1.5)	1.1	(0.8-1.5)
Grade				
G1	128	31.1%	194	27.4%
G2	208	50.6%	377	53.2%
G3	74	18.0%	130	18.4%
Unknown	1	0.2%	0	0.0%
Number of Pos SLNs				
0	352	85.6%	599	84.6%
1	44	10.7%	83	11.7%
≥2	15	3.6%	14	2.0%
No SLNB	0	0.0%	12	1.7%
Total number of Pos LN				
0	352	85.6%	599	84.6%
1-3	54	13.1%	93	13.1%
4-9	4	1.0%	2	0.3%
≥ 10	1	0.2%	2	0.3%
ALND				
ALND performed	15	25.4%*	97	13.7%
Final breast surgery				
Lumpectomy	312	75.9%	703	99.3%
Mastectomy	99	24.1%	5	0.7%
Oncologic outcomes				
Ipsilateral breast recurrence alone	3	0.7%	7	1.0%
Regional recurrence alone	1	0.2%	3	0.4%
Ipsilateral breast and axillary recurrence	2	0.5%	2	0.3%
Distant metastasis	4	1.0%	13	1.8%
Death from breast cancer	2	0.5%	0	0.0%
Death from unknown cause	1	0.2%	21	3.0%
Median (IQR) follow-up (months)	26.3	(11.4-39.6)	69.6	(64-82.8)

*among those with pos SLN

1688335 - Does the Type of Endocrine Therapy Differentially Affect Quality of Life in Older (≥ 70 years) Women with Early-stage Breast Cancer?

Keva Li, Manjeet Chadha, Erin Moshier, Weijia Fu, Barry Rosenstein

Icahn School of Medicine at Mount Sinai, New York, NY

Background/Objective: There is limited data on health-related quality of life (HRQoL) in older breast cancer (BC) patients. This study aims to examine patient reported outcomes (PROs) by type of endocrine therapy (ET) prescribed, aromatase inhibitors (AI) or tamoxifen (Tam) to estrogen receptor positive BC patients ≥70 years with treated with breast conservation surgery (BCS) + radiation therapy (RT) + ET.

Methods: This is a retrospective review of a multi-center prospective REQUITE study across Europe and North America. Among the 2,057 women recruited, we identified 201 women ≥70 years and treated with BCS+RT+ET as the only prescribed systemic therapy. The PRO data using the EORTC-QLQ-C30, and BR23 questionnaire was obtained at baseline after BCS, post-RT, and at follow up 1, 2, and 3 years. The statistical methods for the study used a mixed model analysis of variance and weighted by the propensity scoring.

Results: The overall mean age is 75.3 years, in which 65% received AI and 35% received Tam. The Tam group had significantly more favorable pathological features compared to the AI group: smaller T-size (T1: 64% vs 77%; p=0.0057) and lower grade (Grade l: 26% vs 16%; p=0.0065) tumors. Both AI and Tam groups experienced borderline significant decline in global health QoL from baseline and at 24 months and this persisted for the Tam group only at 36 months. Both the Tam and AI groups showed comparable decrease in physical functioning at 24 months, but with a greater decline observed in the Tam group at 36 months (-8.18, 95% CI: [-16.95, 0.59]; p=0.067). There was a negative impact on cognition in both ET groups. However, examining the differences in mean change from baseline between the groups, we observed Tam had a more negative effect on cognitive functioning than the AI group immediately after RT (-6.43, 95% CI: [-12.64, -0.22]; p=0.0425) and at 36 months (-12.05, 95% CI: [-23.59, -0.5]; p=0.0408). The worsening symptoms of insomnia from baseline observed in both groups was less likely to improve in the AI group compared to the Tam group at 12, 24, and 36 months (p=0.0086, 0.0719, and 0.0436, respectively). In addition, in both groups we observed a statistically significant increase in systemic side effects from baseline, at post-RT, 12 months, and 24 months. However, at 36 months the AI group continued to report significantly increased side effects (5.43, 95% CI: [1.57, 9.29]; p=0.0060). A statistically significant difference in mean change from baseline between groups was noted with more arm symptoms in the AI group at 36 months (11, 95% CI: [0.97, 21.03]; p=0.0316) compared to Tam group. No difference in pain symptoms or fatigue were observed between the two groups.

Conclusions: This study illustrates a differential impact on HRQoL by type of ET prescribed in older BC patients. Tam had a more significant negative effect on global health, physical functioning, and cognitive functioning. While AI was associated with more systemic side effects and worse insomnia symptoms. Further research is needed to optimize selection of risk-tailored ET options for treating older women.

1688403 - Surgical Outcomes from the Phase 3 KEYNOTE-756 Study of Neoadjuvant Pembrolizumab Plus Chemotherapy Followed by Adjuvant Pembrolizumab Plus Endocrine Therapy for Early-stage High-risk ER+/HER2− Breast Cancer

Peter Fasching[1], Aditya Bardia[2], Zhenzhen Liu[3], Zhimin Shao[4], Hiroyuki Yasojima[5], Joyce O'Shaugnessy[6], Heather McArthur[7], Peter Schmid[8], Javier Cortes[9], Nadia Harbeck[10], Melinda L. Telli[11], David W. Cescon[12], Delphine Loirat[13], Yeon Hee Park[14], Manuel Gonzalez Fernandez[15], Gábor Rubovszky[16], Seock-Ah Im[17], Rina Hui[18], Toshimi Takano[19], Fabrice André[20], Yu Ding[21], Liyi Jia[21], Kim M. Hirshfield[21], Fatima Cardoso[22]

[1]University Hospital Erlangen, Comprehensive Cancer Center Erlangen-EMN, Bavarian Cancer Research Center, Erlangen, Bayern, Germany, [2]University of California, Los Angeles, CA, [3]Henan Breast Cancer Center, Affiliated Cancer Hospital of Zhengzhou University & Henan Cancer Hospital, Zhengzhou, Henan, China (People's Republic), [4]Fudan University Shanghai Cancer Center, Shanghai Medical College, Fudan University, Shanghai, China (People's Republic), [5]NHO Osaka National Hospital, Osaka, Japan, [6]Baylor University Medical Center, Texas Oncology, US Oncology Network, Dallas, TX, [7]University of Texas Southwestern Medical Center, Dallas, TX, [8]Centre for Experimental Cancer Medicine, Barts Cancer Institute, Queen Mary University London, London, England, United Kingdom, [9]International Breast Cancer Center, Pangaea Oncology, Quironsalud Group, Barcelona, Spain; Medical Scientia Innovation Research, Barcelona, Spain; Universidad Europea de Madrid, Madrid, Spain, Barcelona, Catalonia, Spain, [10]LMU University Hospital, Munich, Bayern, Germany, [11]Stanford University School of Medicine, Stanford, CA, [12]Princess Margaret Cancer Centre, Toronto, ON, Canada, [13]Institut Curie, Paris, Ile-de-France, France, [14]Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Seoul-t'ukpyolsi, Republic of Korea, [15]Hemato Oncólogo, IMAT-Oncomedica, Montería, Cordoba, Colombia, [16]National Institute of Oncology, Budapest, Hungary, [17]Seoul National University Hospital, Cancer Research Institute, Seoul National University College of Medicine, Seoul-t'ukpyolsi, Republic of Korea, [18]Westmead Breast Cancer Institute, Westmead Hospital and the University of Sydney, Sydney, NSW, Australia; Centre of Cancer Medicine, the University of Hong Kong, Hong Kong, [19]The Cancer Institute Hospital of JFCR, Tokyo, Japan, [20]Faculté de Medicine Paris-Sud XI, Gustave Roussy, Villejuif, Ile-de-France, France, [21]Merck & Co., Inc., Rahway, NJ, [22]Champalimaud Clinical Centre/Champalimaud Foundation, Lisbon, Lisboa, Portugal

Background/Objective: Background: KEYNOTE-756 (NCT03725059) is a global, randomized, phase 3 study of neoadjuvant pembrolizumab or placebo plus chemotherapy followed by adjuvant pembrolizumab or placebo plus endocrine therapy (ET) in patients with early-stage high-risk ER+/HER2− breast cancer. The first interim analysis showed a statistically significant improvement in pathological complete response (pCR) in the pembrolizumab plus chemotherapy arm compared with the placebo plus chemotherapy arm (24.3% vs 15.6%; estimated difference, 8.5 percentage points, P=0.00005). Understanding whether neoadjuvant immunotherapy affects surgical outcomes can help guide treatment decisions for these patients. This exploratory analysis presents surgical outcomes in patients treated with neoadjuvant immunotherapy in KEYNOTE-756.

Methods: Methods: Patients (≥18 years) with T1c-2 (≥2 cm) cN1-2 or T3-4 cN0-2, centrally confirmed, grade 3, invasive ductal ER+/HER2− breast cancer were randomized 1:1 to receive pembrolizumab 200 mg Q3W or placebo as neoadjuvant treatment, both given with paclitaxel QW for 12 weeks, followed by 4 cycles of doxorubicin or epirubicin + cyclophosphamide (Q2W or Q3W at the investigator's discretion). Patients underwent surgery (breast conservation or mastectomy ± sentinel lymph node biopsy or axillary dissection) no later than 6 weeks after the last dose of the neoadjuvant treatment. Within 2–8 weeks post-surgery, patients received (± sequential or concurrent radiation therapy) adjuvant pembrolizumab or placebo for 9 cycles plus standard ET or until recurrence/unacceptable toxicity. Dual primary endpoints are pCR (ypT0/Tis ypN0) and EFS. Safety was a secondary endpoint. In this analysis, AEs were assessed from day 0 (surgery day) to day 30 post-surgery before the first adjuvant treatment, including radiation therapy. Evaluation of the rate of BCS following neoadjuvant treatment and residual cancer burden (RCB) assessed by local pathologists at the time of surgery were prespecified exploratory objectives. RCB-0, 1, 2, and 3 denote increasingly bulky residual disease.

Results: Results: 1278 patients from 222 global sites were randomized to pembrolizumab + chemotherapy (n=635) or placebo + chemotherapy (n=643). 614 (96.7%) patients in the pembrolizumab arm and 631 (98.1%) patients in the placebo arm had documented surgery. The prospectively recorded type and timing of surgery were generally similar in both treatment arms (Table). There were more patients with RCB-0 (24.7% vs 15.6%) and RCB-1 (10.2% vs 8.1%) and fewer patients in the RCB-2 (40.8% vs 45.3%) and RCB-3 categories (20.5% vs 28.9%) in the pembrolizumab versus the placebo arm. During post-surgery follow-up (days 0–30) and before starting adjuvant treatment, 32.1% of patients in the pembrolizumab arm (n=614) and 30.7% in the placebo arm (n=631) experienced ≥1 AE. The only AE occurring in ≥5% of patients in either arm was procedural pain (5.2% vs 6.5%, respectively). Treatment-related grade ≥3 AEs occurred in 1.3% and 0.5% of patients in the pembrolizumab and placebo arms, respectively (no grade 5 in either arm).

Conclusions: Conclusions: Data from KEYNOTE-756 show that addition of pembrolizumab to chemotherapy had no adverse impact on surgical outcomes (including the type, timing, and safety of surgery) and shifted RCB to lower residual disease categories. These results further support the benefit of this regimen in patients with early-stage high-risk ER+/HER2− breast cancer.

Table 1.

	Pembrolizumab + Chemotherapy	Placebo + Chemotherapy
Type of breast surgery, n (%)	**n = 635**	**n =643**
Breast-conserving surgery	262 (41.3)	281 (43.7)
Mastectomy	351 (55.3)	350 (54.4)
Other[a]	1 (0.2)	0
No surgery	21 (3.3)	12 (1.9)
Timing of surgery[b], median (range), mo		
	n = 614	**n = 630[c]**
From end of neoadjuvant treatment to surgery	1.1 (0.1–10.8)	1.0 (0.1–7.0)
	n=478[d]	**n = 524[d]**
From surgery to adjuvant treatment	1.2 (0.1–6.8)	1.2 (0.1–6.0)

[a]1 patient in the pembrolizumab plus chemotherapy arm had a single surgery through the axilla due to the location of the primary tumor.

[b]This analysis was not a randomized comparison and should be interpreted with caution.

[c]1 patient in the placebo plus chemotherapy arm did not receive neoadjuvant treatment but had surgery.

[d]136 patients in the pembrolizumab plus chemotherapy arm and 106 patients in the placebo plus chemotherapy have not received adjuvant treatment following neoadjuvant treatment and surgery.

1688404 - Internal Mammary Lymphadenopathy Does Not Impact Oncologic Outcomes in Patients Treated with Neoadjuvant Chemotherapy: Results from the I-SPY2 Clinical Trial

Mara Piltin[1], Peter Norwood[2], Rita Mukhtar[3], Velle Ladores[4], Candice Sauder[5], Gretchen Ahrendt[6], Mehra Golshan[7], Cletus Arciero[8], Jennifer Tseng[9], Marie Lee[10], Rachael Lancaster[11], Laura Esserman[3], ISPY2 Locoregional Working Group[3], Judy Boughey[1]

[1]Mayo Clinic, Rochester, MN, [2]Quantum Leap Healthcare Collaborative, San Francisco, CA, [3]University of California - San Francisco, San Francisco, CA, [4]UCSF Health, San Francisco, CA, [5]UC Davis Health Comprehensive Cancer Center, Sacramento, CA, [6]University of Colorado School of Medicine, Aurora, CO, [7]Yale University, New Haven, CT, [8]Emory University Hospital, Atlanta, GA, [9]City of Hope Orange County, Irvine, CA, [10]H. Lee Moffitt Cancer Center, Tampa, FL, [11]University of Alabama at Birmingham, Birmingham, AL

Background/Objective: Internal mammary lymphadenopathy (IML) in patients with breast cancer is diagnosed by radiographic assessment, usually without percutaneous biopsy. IML plays an important role in disease stage and prognosis assessment. We aimed to evaluate method of IML detection, how IML impacts response to modern neoadjuvant chemotherapy (NAC), and oncologic outcomes.

Methods: We evaluated patients enrolled in the prospective randomized ISPY-2 clinical trial from 2010-2022 for IML. We captured method of IML detection (breast MRI, PET-CT or both) and compared the cohort with IML to those without. Rates of locoregional recurrence (LRR), distant recurrence (DR) and event free survival (EFS) were compared by bivariate analysis .

Results: Of 2,095 patients, 198 (9.5%) had IML reported on pre-treatment imaging. All patients had MRI per study protocol (of which 8.9% had IML), and 505 patients (24.1%) had PET-CT (of which 8.7% had IML). Method of IML detection was 154 (77.8%) by MRI only, 11 (5.6%) by PET-CT only and 33 (16.7%) by both MRI and PET-CT. Of the patients who had IML by MRI with measurements reported (n=35/187), the mean largest node measured 7.52 mm (SD 3.18) overall. Of those with IML by PET with recorded SUVmax (n=38/44), the mean SUVmax was 4.39 (SD 3.8). Factors associated with IML were younger age (p=0.001), larger tumors (p< 0.001), and higher tumor grade (p=0.027). Biologic subtype was not associated with IML (p=0.95). Pathologic complete response (pCR) was slightly higher in the IML group (41.4% vs 34.0%, p=0.05). Comparing patients with IML and without IML, there was no difference in type of breast or axillary surgery performed (p=0.41, p=0.16) however patients with IML were more likely to undergo radiation therapy (68.2% vs 54.1%, p< 0.001). With a median follow up time of 3.7 years (range 0.4-10.2), there was no significant difference between patients with IML versus without in terms of LRR (5.6% vs 3.8%, p=0.25), DR (9.1% vs 7.9%, p=0.58) or EFS (61.6% vs 57.2%, p=0.48). This was true for both patients with pCR and with residual disease. Of the patients who had a pCR (n=727), presence of IML did not significantly impact LRR (2.4% vs 0.6%, p=0.14), DR (4.9% vs 2.6%, p=0.282) or EFS (70.7% vs 68.4%, p=0.1). While patients without a pCR (n=1,279) had worse oncologic outcomes overall, the presence of IML did not significantly impact LRR (8.5% vs 5.9%, p=0.29), DR (13.2% vs 11.3%, p=0.527) or EFS (60.4% vs 54.8%, p=0.68) within this group.

Conclusions: In this large cohort of patients treated with neoadjuvant chemotherapy, oncologic outcomes were not negatively impacted by the presence of IML. This was observed across patients who achieve a pCR in the breast and axilla as well as those who do not. There was no difference in the type of breast or axillary surgery performed and those with IML had higher rates of radiation therapy. We demonstrated that IML may influence treatment selection but is not a poor prognostic indicator when treated with modern neoadjuvant chemotherapy and multidisciplinary disease management.

Friday, April 12, 2024, 5:30 pm–6:15 pm Moderators: Preeti Subhedar, MD, FACS; Paul Thiruchelvam, BSc, MD, FACS, PhD

1684205 - Contemporary Axillary Surgical Management in Patients with Pathologically Node-positive Disease After Neoadjuvant Chemotherapy - A Survey of Members of the American Society of Breast Surgeons

Anna Weiss[1], Fernando Colugnati[2], Melissa Mitchell[3], Yue Li[2], Ciara O'Sullivan[4], Judy Boughey[4]

[1]University of Rochester, Fairport, NY, [2]University of Rochester, Rochester, NY, [3]University of Texas MD Anderson Cancer Center, Houston, TX, [4]Mayo Clinic, Rochester, MN

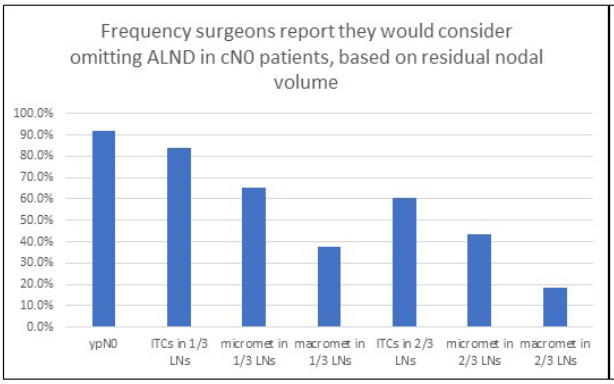
Background/Objective: While results of the Alliance A011202 clinical trial are awaited, there is controversy regarding omission of axillary lymph node dissection (ALND) in breast cancer patients with pathologically node-positive disease after neoadjuvant chemotherapy (NAC). The aim of this study was to understand when surgeons consider omitting ALND in this setting, and what factors influence their decisions.

Methods: We surveyed members of the American Society of Breast Surgeons about their opinions regarding omission of ALND in different clinical scenarios. Demographics and other responses were tabulated. To identify patterns, a multiple correspondence analysis was performed followed by a cluster analysis on the coordinates provided by the former. Practice patterns were then interpreted from these respondent clusters and Chi-square analyses were performed to determine if cluster characteristics were significantly ($P < 0.05$) associated with practice patterns, specifically omission of ALND.

Results: 328/2,172 (15.1%) Society members completed the survey in February 2023. 60.7% reported they always and 30.8% reported they mostly offer sentinel lymph node surgery to cN1 patients who respond to NAC. 43.9% reported they sometimes and 18.9% reported they often omit ALND despite detecting residual nodal disease after NAC, while 20.4% reported they never omit ALND in this setting. Most (57.3%) respondents' institutions did not participate in the A011202 trial and 63.7% respondents' institutions never offer prophylactic lymphedema procedures. For both cN0 and cN1 patients with residual nodal disease after NAC, respondents less often consider omitting ALND as volume of nodal disease increases (Figure). 47.3% reported they would consider omitting ALND for cN1 patients with 1 micrometastasis, while only 8.5% would consider omitting ALND for cN1 patients with 2 macrometastases. Respondents were more likely to consider omission of ALND in cN0 than in cN1 disease ($P < 0.05$ across all volumes). The most frequently reported factors influencing decisions to omit ALND were administration of radiation (74.1%), patient age (70.1%) and comorbidities (67.1%), and the number of positive sentinel nodes (61.3%). 87.7% reported that their radiation oncologists target the level I-II axilla for patients in whom ALND was omitted. The most common reasons for ALND omission included the beliefs that ALND would not improve loco-regional (48.2%) or distant recurrence or survival (47.6%) when axillary radiation is administered. Many also reported they consider omission because additional information provided by ALND will not change adjuvant treatments (38.7%). There were 3 clusters of similar respondents. The respondent group comprised of private practice surgeons, most practicing for 21 years or more, consider omitting ALND across all clinical scenarios significantly more frequently than the other 2 clusters.

Conclusions: Surgeons are often considering omission of ALND in patients with residual nodal disease after NAC, but are more likely to do so in patients with cN0 than cN1 disease, and in patients with smaller volumes of residual nodal disease. These decisions are based largely on a perceived lack of oncologic benefit despite the lack of data proving as such.

Figures: Frequency surgeons report they would consider omitting ALND in cN0 and cN1 patients, based on residual nodal volume


Frequency surgeons report they would consider omitting ALND in cN0 patients, based on residual nodal volume
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
ypN0
ITCs in 1/3 LNs
micromet in 1/3 LNs
macromet in 1/3 LNs
ITCs in 2/3 LNs
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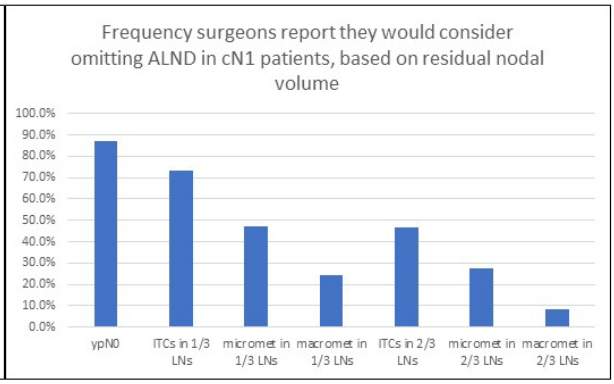
Frequency surgeons report they would consider omitting ALND in cN1 patients, based on residual nodal volume
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
ypN0
ITCs in 1/3 LNs
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ITCs in 2/3 LNs
micromet in 2/3 LNs
macromet in 2/3 LNs

1680655 - Clipped Axillary Node as a Potential Surrogate for Overall Axillary Nodal Status in Inflammatory Breast Cancer Patients After Neoadjuvant Chemotherapy

Kush Lohani, Tanya Hoskin, Judy Boughey, Tina Hieken, Amy Degnim

Mayo Clinic, Rochester, MN

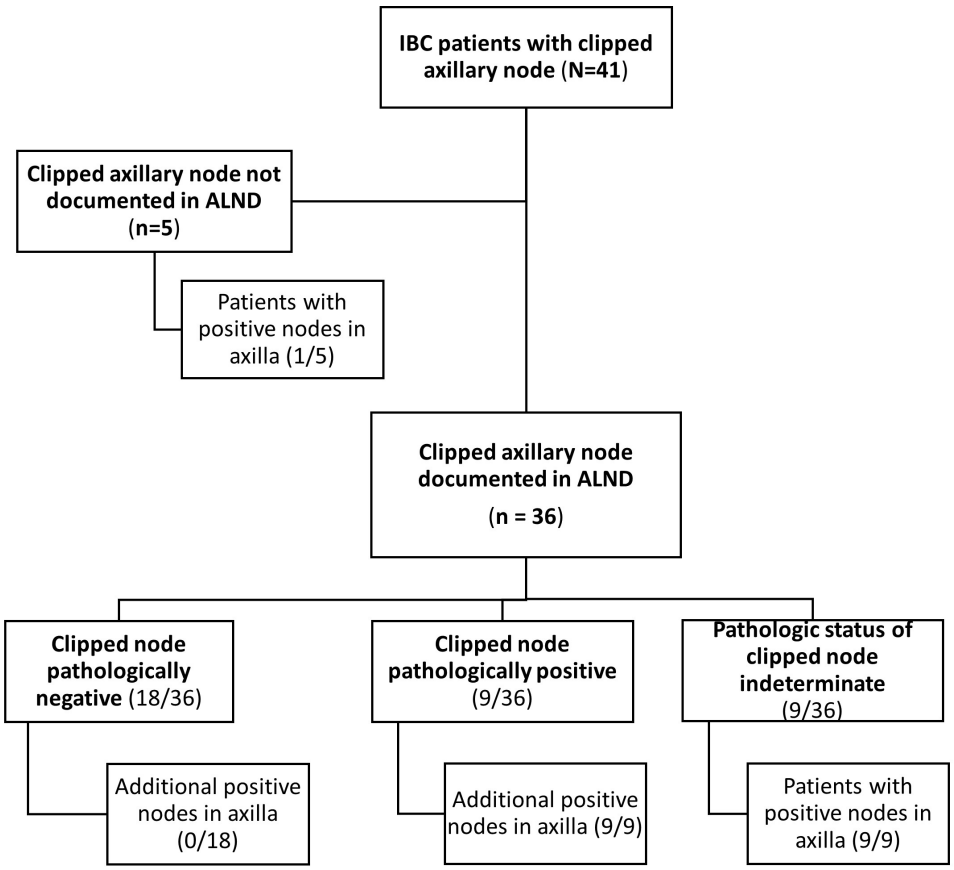
Background/Objective: Axillary lymph node dissection (ALND) is the current standard of care for the management of axilla in inflammatory breast cancer (IBC). Early reports showed high false negative rates (FNR) with sentinel lymph node biopsy. The goal of the present study is to determine if the clipped axillary node accurately represents the overall nodal status of axilla after neoadjuvant chemotherapy (NAC) in IBC.

Methods: After Institutional Review Board approval, our prospective breast surgery registry was reviewed to identify IBC patients who had operation between 2017 and 2023, granted research consent, and had clip placement in a positive axillary node at diagnosis. Clinical, imaging, pathological, and operative findings were analyzed. Use of radioactive I-125 seed localization was recorded, and operative notes, specimen radiographs, and pathology reports were reviewed to confirm final status of clipped nodes. ER and PR status were classified as positive if ≥ 1% of BC cells expressed receptors. Her2-positivity was defined as IHC score of 3+ or amplified FISH. Statistical analyses were performed using Fisher's exact tests. Confidence intervals for estimated percentages were calculated using the Wilson method.

Results: 41 patients with IBC (median age=55, 80% invasive ductal, 10% invasive lobular and 10% mixed mammary) underwent clip placement in the positive axillary node. Initial clinical nodal staging was cN1 (37%), cN2 (15%) and cN3 (49%). Tumors were HER2 enriched (44%), ER+/Her2- (34%), or triple negative (ER-/PR-/Her2-) (22%). All received NAC, with post-NAC clinical nodal response assessed on imaging in 34 (83%), clinical exam in 6 (15%) and not documented in one patient. Imaging or clinical exam nodal response post-NAC was complete in 29/40 (73%) and partial in 11/40 (28%). Preoperative I-125 seed localization was performed in 17%. Removal of the clipped node in the ALND specimen was confirmed in 36/41 (88%) patients, and pathologic status of the clipped nodes was available in 27/36 (75%) (Fig. 1). Among 18 patients with retrieved clipped nodes that were pathologically negative, none had additional positive nodes for a false negative rate of 0% (95% CI:0-18%). Conversely, all 9 patients with pathologically positive clipped nodes had additional positive nodes in ALND specimen. Among the 5 patients without documented clipped node retrieval in ALND, 1/5 (20%) had additional positive nodes in ALND. Overall, nodal pathological complete response (pCR) was seen in 22/41 (54%) and was not statistically different among those with complete versus partial imaging/clinical nodal response post-NAC (14/29=48% vs 7/11=64%, p=0.49). Nodal pCR was more frequent in patients where resection and pathologic status of the clipped nodes was confirmed as compared to those where clipped node resections were confirmed but the clipped node pathologic status was indeterminate (67% vs. 0%, p=0.001).

Conclusions: Clipped axillary node in IBC accurately represented the overall axillary nodal status in IBCs post-NAC. The findings have important implications and suggest that IBC patients with histologically negative clipped axillary nodes may not require ALND, and they may be appropriate candidates for targeted sentinel node dissection with removal of the clipped node similar to other node positive patients treated with NAC.

Figure 1: Flow chart of IBC patients with clip placement in the positive axillary node at initial diagnosis. ALND = axillary lymph node dissection, IBC = inflammatory breast cancer



1686230 - Accuracy of Breast MRI for Surgical Planning After Neoadjuvant Therapy for Patients with Invasive Lobular Carcinoma

Tesia McKenzie[1], Alisha Othieno[2], Astrid Quirarte[2], Firdows Mujir[2], Mary Abel[3], Rita Mukhtar[2]

[1]UCSF; Hackensack Meridian Health Riverview Medical Center, Long Branch, NJ, [2]University of California, San Francisco, San Francisco, CA, [3]Brigham and Women's Hospital-Massachusetts General Hospital, Boston, MA

Background/Objective: Breast cancer is the most common malignancy in women, with invasive lobular carcinoma (ILC) being the second most common subtype. A major challenge in the treatment of ILC is the decreased sensitivity of standard imaging tools. While breast MRI has the highest sensitivity, its utility in the pre-operative evaluation of patients with ILC, particularly after neoadjuvant therapy, is unclear. We evaluated the accuracy of breast MRI for patients with ILC after neoadjuvant treatment, comparing disease extent on MRI to tumor size on surgical pathology.

Methods: We identified neoadjuvantly treated patients from an institutional ILC database. We evaluated factors associated with type of neoadjuvant therapy (chemotherapy [NACT] or endocrine [NET]), and abstracted pre and post treatment MRI features from imaging reports (tumor phenotype as mass, non-mass enhancement (NME), or both; tumor longest diameter/extent of disease).We determined concordance of longest tumor diameter on post-treatment breast MRI with surgical pathology tumor size stratified by therapy type and MRI tumor phenotype, and evaluated rates of underestimation of tumor size using Stata 18.0.

Results: Of the 223 patients with ILC who received neoadjuvant therapy, 139 (62.3%) had post-treatment MRI data available and comprise the study cohort. Average age was 56.6 years (range from 27-83); 90 patients (64.8%) received NACT and 49 (35.3%) received NET. NACT was significantly more common in those with hormone receptor-negative disease or higher tumor grade. At baseline MRI, average tumor size was larger in the NACT group than in the NET group (5.3 cm versus 3.8 cm, respectively, p=0.0037). After treatment, there was no difference in average tumor size on post-treatment imaging between the NACT and NET groups (3.8 cm and 3.2 cm, respectively, p=0.266). Post-treatment tumor phenotype on MRI after NACT versus NET was: mass in 57.8% and 42.2% respectively, mass plus NME in 60.0% and 40.0% respectively, and NME only in 69.8% and 30.2% respectively. These values did not differ significantly (p=0.481). We found a moderate positive correlation between the size of the tumor on post-treatment MRI and on surgical pathology after NACT (r=0.56) and after NET (r=0.69), ($p< 0.0001$ for both). However, post-treatment MRI underestimated tumor size in 64.3% of patients. Underestimation on breast MRI was significantly more common in patients after NET compared to NACT (78.4% versus 55.7%, p=0.023), and among patients with NME on post-treatment MRI (74.1% versus 51.2%, p=0.02). The average size discrepancy between post-treatment MRI and surgical pathology was 0.99 cm (0.87 cm in the NACT group vs 1.19 cm in the NET group).

Conclusions: Type of neoadjuvant therapy and tumor appearance on post-treatment MRI can influence the accuracy of breast MRI for determining tumor size in patients with ILC. Patients with ILC who received NET and have NME on post-treatment MRI are more likely to have underestimation of tumor size. Therefore, MRI may be less accurate for surgical planning in these patients. These findings may influence the surgical approach including the use of shave margins and specimen size, particularly in those patients who desire breast conservation therapy after neoadjuvant treatment for ILC.

1687048 - Prepectoral Versus Subpectoral Breast Reconstruction After Mastectomy: Long-term Patient-reported Outcomes and Surgical Outcomes

Anna Stachura[1], Rubie Jackson[2], Tripp Holton, III[3], Sammi Scarola[2], Micaela Moen[4], Justin Turcotte[2], Laura Martino[2], Charles Mylander[2]

[1]Uniformed Services University / Walter Reed National Military Medical Center, Bethesda, MD, [2]Anne Arundel Medical Center/Luminis Health, Annapolis, MD, [3]Annapolis, MD, [4]Anne Arundel Medical Center, Atlanta, GA

Background/Objective: The subpectoral plane traditionally has been favored over the prepectoral plane in implant-based breast reconstruction due to high rates of complications and unsatisfactory cosmetic results with the prepectoral plane. With technical advancements, the paradigm has shifted over the past 10 years towards embracing prepectoral reconstruction, which reduces animation deformity and pain from pectoralis elevation. Multiple studies have demonstrated an acceptable complication profile and early patient satisfaction for prepectoral reconstruction. There is still limited understanding of long-term results and patient reported outcomes (PRO) with prepectoral reconstruction. This study evaluates long-term PRO and surgical outcomes for prepectoral versus subpectoral implant-based reconstruction.

Methods: Patients at our institution who underwent mastectomy with implant-based reconstruction from 2015 to 2020 were identified by retrospective chart review and contacted for prospective assessment using BREAST-Q domains to assess PRO (see Table for domains assessed). Charts were reviewed for demographics, treatment characteristics, and surgical outcomes. Univariate analyses were performed to compare characteristics and outcomes of patients undergoing prepectoral and subpectoral reconstruction. Subgroup analyses comparing outcomes of patients who underwent post-mastectomy radiation was also performed.

Results: In total, 560 patients had implant-based reconstruction in the study period; 125 (22%) completed the BREAST-Q domains (prepectoral, n = 105; subpectoral, n = 20) and were included in the study. No significant differences in age, race, BMI, ASA score, or comorbidities were observed between groups. The prepectoral group more commonly had a greater number of direct to implant (57.1% vs. 10.0%, $p< 0.01$) as well as nipple sparing mastectomy procedures (50% vs. 20%, $p=0.04$) than the subpectoral group. The average follow-up time was shorter in the prepectoral cohort (4.4 ± 1.2 vs. 6.1 ± 1.4 yrs., $p< 0.01$); however, all patients had minimum follow up of 2 years. There was no statistical difference in complication rates between prepectoral and subpectoral (18% vs. 15%, $p=0.709$). Overall satisfaction with breasts was similar between groups (Table). However, patients undergoing prepectoral reconstruction reported higher levels of physical wellbeing, satisfaction with animation deformity, satisfaction with implant appearance, and satisfaction with implant feel, compared to subpectoral reconstruction patients (Table). Radiation was associated with lower levels of overall satisfaction with breasts, physical well-being, and satisfaction with implant feel in the prepectoral cohort, but not in the subpectoral cohort . Conversely, radiation was associated with lower levels of satisfaction with animation deformity and implant feel in the subpectoral cohort, but not in the prepectoral cohort (Table).

Conclusions: This is the largest study to date to evaluate the long-term PRO after prepectoral reconstruction. A strength of this study is that it included only patients with >2 years of follow-up. While overall postoperative satisfaction was similar between patients undergoing prepectoral and subpectoral reconstruction, the prepectoral approach was associated with greater levels of physical well-being, satisfaction with animation deformity, and implant appearance/feel. Post-mastectomy radiation resulted in worse PRO and appeared to differentially affect satisfaction domains based on the plane of reconstruction. These results suggest the prepectoral approach may yield improved long-term satisfaction with breast reconstruction, but further study is required to elucidate additional factors influencing long-term outcomes.

Table 1: BREAST-Q scores

Table: BREAST-Q Scores				
Overall Study Group				
	Prepectoral	Subpectoral		
	Average ± STDEV	Average ± STDEV	P Value	Domain Scale
Satisfaction with Breast	61.8 ± 18.1	57.9 ± 20.7	0.389	0-100
Physical Well-being: Chest	80.1 ± 17.4	65.2 ± 27.0	0.002	0-100
Breast Animation Deformity	82.1 ± 20.0	63.8 ± 22.4	<0.001	0-100
Satisfaction with Implant (see)	3.0 ± 1.0	2.4 ± 1.0	0.021	1-4
Satisfaction with Implant (feel)	3.0 ± 0.9	2.5 ± 1.0	0.017	1-4
Prepectoral Subgroup: Radiation versus No Radiation				
	No Radiation	Radiation		
	Average ± STDEV	Average ± STDEV	P Value	Domain Scale
Satisfaction with Breast	65.1 ± 17.5	50.6 ± 15.7	<0.001	0-100
Physical Well-being: Chest	82.4 ± 16.5	72.3 ± 18.2	0.012	0-100
Breast Animation Deformity	84.1 ± 17.9	75.0 ± 24.9	0.047	0-100
Satisfaction with Implant (see)	3.1 ± 1.0	2.6 ± 1.1	0.051	1-4
Satisfaction with Implant (feel)	3.1 ± 0.8	2.5 ±1.1	0.005	1-4
Subpectoral Subgroup: Radiation versus No Radiation				
	No Radiation	Radiation		
	Average ± STDEV	Average ± STDEV	P Value	Domain Scale
Satisfaction with Breast	58.8 ± 21.0	55.0 ± 21.0	0.661	0-100
Physical Well-being: Chest	69.7 ± 27.6	51.8 ± 21.0	0.096	0-100
Breast Animation Deformity	68.3 ± 22.4	50.0 ± 16.4	0.037	0-100
Satisfaction with Implant (see)	2.6 ± 1.0	1.8 ± 0.8	0.043	1-4
Satisfaction with Implant (feel)	2.6 ± 1.0	2.0 ± 0.7	0.106	1-4

1688070 - The Utility of Frozen Section Diagnosis Following Neoadjuvant Chemotherapy in Patients with Clinically Node-negative HER2-positive or Triple-negative Breast Cancer

Kerollos Wanis, Alycia So, Alexa Glencer, Lianna Goetz, Susie Sun, Mediget Teshome, Rosa Hwang, Kelly Hunt, Lei Huo, Puneet Singh

University of Texas MD Anderson Cancer Center, Houston, TX

Background/Objective: Axillary lymph node dissection is the current standard of care for patients with any positive sentinel lymph nodes (SLNs) following neoadjuvant systemic therapy. Frozen section at the time of SLN biopsy can provide immediate direction regarding the need for axillary dissection, allowing completion of all necessary axillary surgery at the index operation. Despite this benefit, frozen section is resource (e.g., time and cost) intensive, technically more challenging after neoadjuvant therapy, and may not be available in many settings. In this study, we estimate the diagnostic test characteristics of SLN frozen section in patients with HER2-postive or triple negative breast cancer who are clinically node negative prior to receiving neoadjuvant systemic therapy.

Methods: We collected clinical and pathologic data for a cohort of patients diagnosed with non-inflammatory, clinically node negative HER2-positive or triple negative breast cancer whose treatment included neoadjuvant systemic therapy (chemotherapy and anti-HER2 therapy as appropriate) and who were treated at our institution from 2015-2019. All patients worked up at our institution underwent pre-treatment axillary ultrasound. We estimated the true prevalence of SLN positivity among all patients who received neoadjuvant systemic therapy, underwent SLN biopsy, and for whom pathological data available. We further estimated the apparent and true prevalence of SLN positivity among those who underwent frozen section evaluation, as well as the diagnostic test characteristics of frozen section in this population.

Results: There were 670 patients who received neoadjuvant systemic therapy and underwent SLN biopsy. The prevalence of SLN positivity was 6.7% (95% CI: 4.9, 8.9). There were 485 patients who underwent frozen section analysis, with 287 (59.2%) triple negative, 62 (12.8%) ER/PR-HER2+, and 136 (28.0%) ER/PR+HER2+. Of those, 33 had ≥1 (median: 1, range: 1-3) positive SLNs on final pathology giving a true prevalence of 6.8% (95% CI: 4.7, 9.4). A total of 19 patients had a positive SLN on frozen section analysis (apparent prevalence: 3.9%, 95% CI: 2.4, 6.1). Frozen section sensitivity was 57.6% (95% CI: 39.2, 74.5), specificity was 100% (95% CI: 99.2,100), positive predictive value was 100% (95% CI: 82.4, 100), and negative predictive value was 97.0% (95.0, 98.3). Final pathology in the 14 cases of false negative frozen section showed isolated tumor cells (35.7%), micrometastases (42.9%), and macrometastases (21.4%). The sensitivity of frozen section for isolated tumor cells or micrometastases was 35.3% (95% CI: 14.2, 61.7). Frozen section and final pathologic results are contrasted in the Table, stratified by approximated breast cancer subtype. Among the 26 (79%) patients who underwent axillary lymph node dissection following a positive SLN, 9 (34.6%) had additional positive lymph nodes.

Conclusions: The true prevalence of positive SLNs in patients with clinically node negative HER2-positive or triple negative breast cancer undergoing modern neoadjuvant systemic therapy is 1 in 15, and the probability of a positive frozen section is less than 1 in 20. Frozen section sensitivity in this population is modest. These estimates suggest that the utility of frozen section in this setting is limited, and evaluation of SLNs is best deferred to final pathology.

Table 1: Frozen section versus final pathology results stratified by approximated breast cancer subtype

Table: frozen section versus final pathology results stratified by approximated breast cancer subtype

ER/PR- HER2-	Final pathology +	Final pathology -	Total
Frozen section +	12	0	12
Frozen section -	8	267	275
Total	20	267	287

ER/PR- HER2+	Final pathology +	Final pathology -	Total
Frozen section +	3	0	3
Frozen section -	1	58	59
Total	4	58	62

ER/PR+ HER2+	Final pathology +	Final pathology -	Total
Frozen section +	4	0	4
Frozen section -	5	127	132
Total	9	127	136

Total	Final pathology +	Final pathology -	Total
Frozen section +	19	0	19
Frozen section -	14	452	466
Total	33	452	485

1688229 - Outcomes of Oncoplastic Reduction Mammoplasty for Patients with Invasive Lobular Carcinoma of the Breast: Positive Margins, Completion Mastectomy Rates, and Recurrence-free Survival

Israel Falade, Kayla Switalla, Astrid Quirarte, Molly Baxter, Daniel Soroudi, Harriet Rothschild, Shoko Abe, Karen Goodwin, Merisa Piper, Michael Alvarado, Bao-Quynh Julian, Cheryl Ewing, Jasmine Wong, John Rose, Laura Esserman, Robert Foster, Rita Mukhtar

University of California - San Francisco, San Francisco, CA

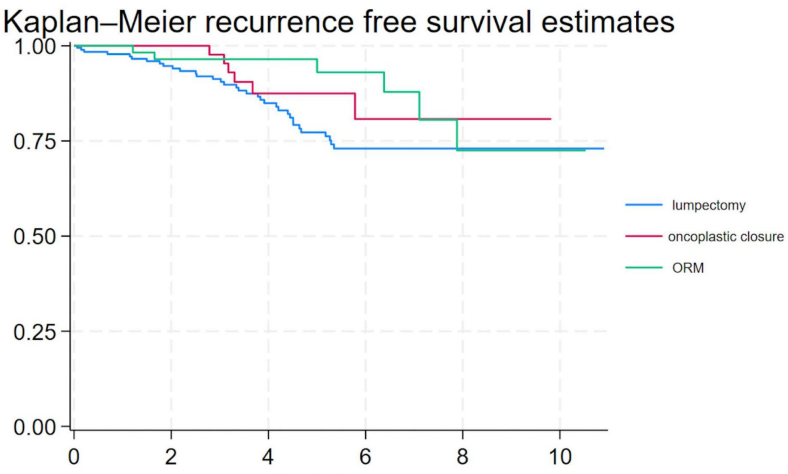
Background/Objective: Oncoplastic reduction mammoplasty (ORM) allows for increased rates of successful breast conserving surgery (BCS). However, its use in patients with diffuse tumors like invasive lobular carcinoma (ILC) is debated due to concerns about management of margins and radiotherapy planning after extensive tissue rearrangement. While we previously showed that patients with ILC who undergo immediate ORM have significantly lower risk of positive margins compared to lumpectomy alone, the long-term safety of this surgical approach has not been studied in ILC. Thus, we aimed to assess both short-term outcomes and the relationship between immediate ORM and recurrence free survival (RFS) in patients with ILC.

Methods: We retrospectively analyzed a prospectively maintained institutional database of patients with ILC. We assessed rates of positive margins, successful BCS, and RFS by type of BCS (lumpectomy alone, lumpectomy with oncoplastic closure, and immediate ORM). Positive margins were defined as ink on tumor, and successful BCS was defined as BCS cases that did not require completion mastectomy. RFS included survival without local or distant recurrence, with patients censored at date of last follow up. Data were analyzed using Pearson's chi-square test, ANOVA, multivariable logistic regression, multivariable Cox proportional hazards models, and Kaplan–Meier survival analysis.

Results: Of 810 patients with stage I-III ILC, 494 had BCS and comprised the study cohort. Among these 494 patients, the average age was 61 years, with 66.0% undergoing lumpectomy alone, 17.4% having lumpectomy with oncoplastic closure, and 16.6% receiving immediate ORM. Of the 82 patients who underwent immediate ORM, 26 (31.7%) had positive margins, which did not differ compared to other types of BCS on univariate analysis. However, when adjusted for tumor size and age, ORM was associated with significantly lower odds of positive margins (OR 0.3, CI 0.1-0.5, $p< 0.001$). Rates of successful BCS differed by procedure type, with ORM and lumpectomy with oncoplastic closure having significantly higher rates of successful BCS compared to lumpectomy alone (87.8% and 94.9% vs 73.9%, $p< 0.001$). This finding persisted on multivariate analysis adjusting for tumor size and age at diagnosis, with immediate ORM (OR 5.7, 95% CI 2.5-12.9, $p< 0.001$) and lumpectomy with oncoplastic closure (OR 7.5, 95% CI 2.9-20.0, $p< 0.001$) being associated with significantly higher odds of successful BCS. There was no significant difference in RFS between immediate ORM and other types of BCS on univariate analysis (Figure 1). Additionally, in a Cox proportional hazards model adjusted for clinicopathologic factors, there were no differences in RFS estimates for ORM (HR=0.6, 95% CI 0.2-1.6, $p=0.315$) or lumpectomy with oncoplastic closure (HR=0.8, 95% CI 0.3-2.2, $p=0.680$) compared to lumpectomy alone.

Conclusions: We found that immediate ORM for patients with stage I-III ILC was associated with lower odds of positive margins, higher rates of successful BCS, and had no negative impact on RFS. These findings affirm the oncologic safety of immediate ORM even in the setting of diffusely growing tumors such as ILC, and may indeed improve surgical outcomes. As such, we would advocate for immediate rather than delayed ORM in patients with ILC who desire BCS.

Figure 1: Kaplan Meier survival estimates by BCS procedure



Number at risk:						
Lumpectomy	191	146	97	57	31	11
Lumpectomy with oncoplastic closure	80	49	28	12	6	0
ORM	78	53	39	22	8	1

1688272 - Surgery Plays a Leading Role Even in Over 90 Breast Cancer Patients Stage

Massimo Ferrucci[1], Daniele Passeri[2], Francesco Milardi[2], Andrea Francavilla[2], Matteo Cagol[1], Tania Saibene[1], Silvia Michieletto[1], Mariacristina Toffanin[1], Ugo Grossi[2], Dario Gregori[2], Alberto Marchet[1]

[1]Veneto Institute of Oncology IOV, Istituto di Ricovero e Cura a Carattere Scientifico, Padova, Veneto, Italy, [2]University of Padua, Padua, Veneto, Italy

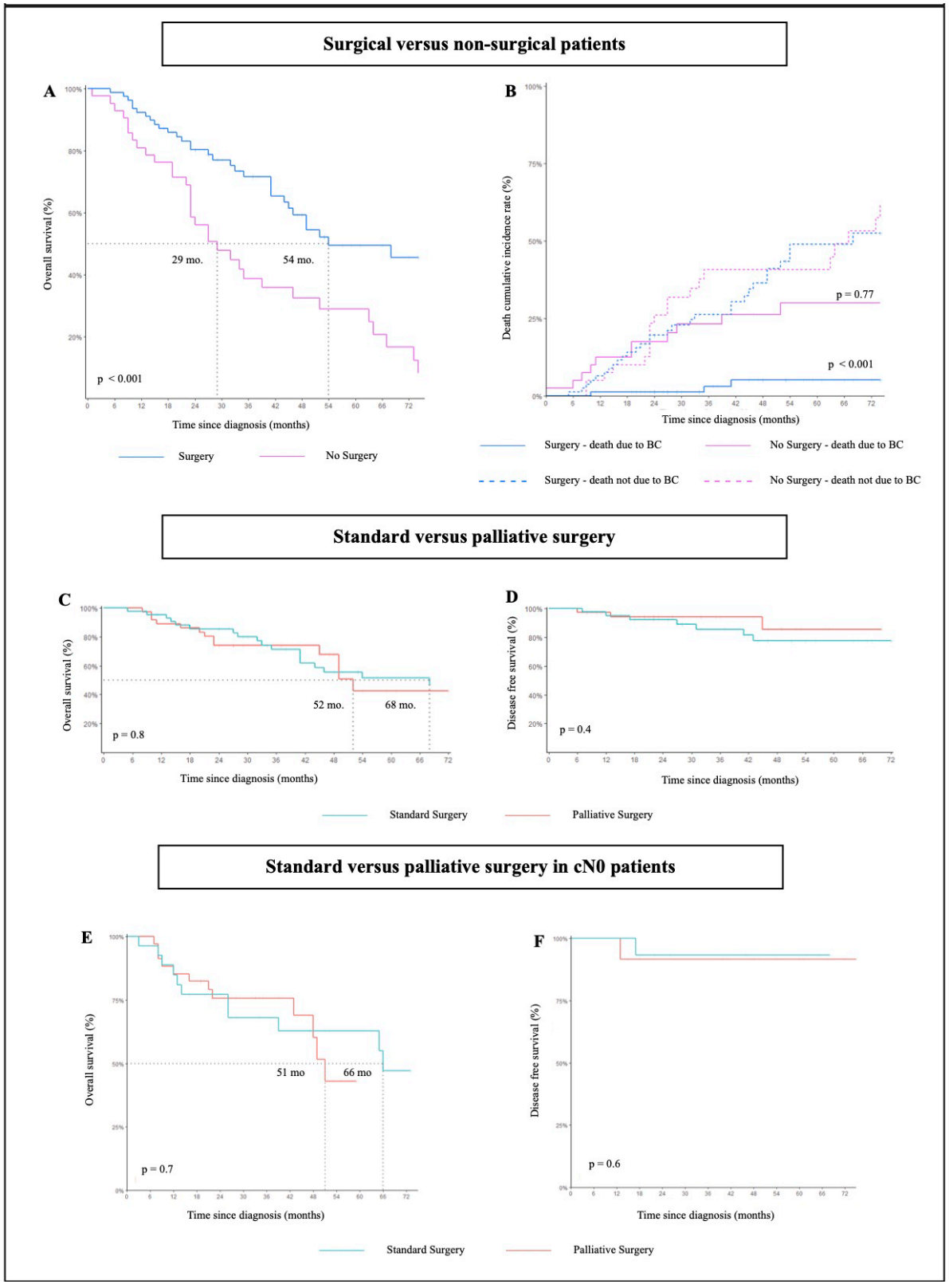
Background/Objective: The population of nonagenarians is growing worldwide, yet nearly 50% of very elderly breast cancer (BC) patients receive suboptimal treatments. Despite pre-existing comorbidities and shorter life expectancy, 40% of women aged 80 or older with BC die from cancer-related causes. Our study focuses on patients aged 90 or older, aiming to analyze clinical and survival outcomes, and assess the potential benefits of surgery within this demographic.

Methods: This was a monocentric retrospective observational study conducted at the Veneto Institute of Oncology. We enrolled patients aged 90 years or older with a new histologic diagnosis of BC, up to stage IV oligometastatic disease, who were treated between January 2007 and December 2018. Patients were divided into three groups: standard protocolled surgery (SS); palliative surgery (PS) without axillary surgery and/or cavity shaving; and no surgery (NS). Clinical and pathologic features were recorded; recurrence rates and survival outcomes were analyzed.

Results: We enrolled 123 nonagenarians with a median age of 93 years (range 90-99). Among them, 45 patients (36.6%) underwent SS, 36 (29.3%) PS, while 42 (34.1%) NS, respectively. The majority of patients (58.6%) were diagnosed with stage II disease. Neoadjuvant hormone therapy was administered to 16% of patients, resulting in a partial response in 69.2% of cases, while 30.8% experienced disease progression. A total of 81 patients (65.9%) underwent surgery, with mastectomy performed in 41% of cases, and wide local excision (WLE) in 59%. Mastectomy was more common among SS patients (63%), while WLE was predominantly performed on PS patients (86.5%) ($p< 0.01$). Among SS patients, sentinel lymph node biopsy was performed in 65.2% of cases, while direct axillary clearance in 30.4%. The overall postoperative complication rate was 53.1%, with breast seroma being the most frequent (24.7%). SS reported a significantly higher overall complication rate than PS ($p< 0.01$). Adjuvant hormone therapy was administered to 74.1% of patients; adjuvant radiotherapy was recommended for only 17.3%. The overall recurrence rate among surgical patients was 12.3%, while the disease progression rate in the NS group was 26.2%. The median overall survival (OS) was significantly higher for patients undergoing surgery (54 months) compared to NS patients (29 months) ($p< 0.001$). BC-related deaths were significantly higher in the NS group (32.4% vs. 9.1% and 7.1% in the SS and PS group, respectively; $p< 0.01$). No significant differences in OS and disease-free survival were found between the SS and the PS group ($p=0.8$ and $p=0.4$, respectively), nor between cN0 patients undergoing SS or PS ($p=0.7$ and $p=0.6$, respectively). Among surgical patients, the Charlson score was the only factor significantly associated with worse OS, according to a Cox regression model ($p=0.028$). Age, tumor stage and, most importantly, the type of surgery ($p=0.8$) did not significantly impact OS.

Conclusions: Elderly patients represent a heterogenous group and warrant tailored BC treatments, taking their frailty into account. A comprehensive geriatric assessment is strongly recommended. Surgery, whenever feasible, should be the treatment of choice, even for nonagenarians. PS emerged as the best option for many, with other treatments reserved for selected cases.

Figure 1: Survival outcomes



1688576 - Limitations in Utilizing Clinicopathologic Factors Alone in Identifying Patients with DCIS Who Benefit from Radiotherapy After Breast-conserving Surgery

Julie Margenthaler[1], Frank A Vicini[2], Chirag Shah[3], David Dabbs[4], Fredrik Warnberg[5], Sheila Weinmann[6], Michael Leo[6], Pat Whitworth[7], Brian Czerniecki[8], G. Bruce Mann[9], Steven Shivers[10], Karuna Mittal[10], Troy Bremer[10]

[1]Washington University School of Medicine, St. Louis, MO, [2]Michigan Healthcare Professionals, MI, [3]Cleveland Clinic, Cleveland, OH, [4]PreludeDx, Laguna Hills, FL, [5]Sahlgrenska Academy at Gothenburg University, Gothenburg, Vastra Gotaland, Sweden, [6]Kaiser Permanente Center for Health Research, Portland, OR, [7]Nashville Breast Center, Nashville, TN, [8]H. Lee Moffitt Cancer Center, Tampa, FL, [9]University of Melbourne, Parkville, Victoria, Australia, [10]PreludeDx, Laguna Hills, CA

Background/Objective: Breast conserving surgery (BCS) with or without radiotherapy (RT) is a mainstay of ductal carcinoma in situ (DCIS) management. Long-term breast cancer-specific survival rates are remarkably high, exceeding 95%, with this approach with over 70% of women not having a local recurrence with BCS alone, and therefore not benefitting from the addition of RT. Thus, there is growing interest in appropriately de-escalating treatment for DCIS. Traditionally, clinicopathologic (CP) factors have been used to identify low-risk DCIS patients. However, prospective trials have failed to consistently identify a truly low-risk CP group that did not benefit from RT with respect to local recurrence rate, or a clear high-risk CP group that consistently benefits from RT. The present study assessed the re-classification of patients with high-risk CP factors into Low and High Risk groups defined by a 7-gene predictive biosignature and associated rates of ipsilateral breast recurrence (IBR).

Methods: Women (n=926) from four international cohorts treated with BCS had samples analyzed at a CLIA lab (Laguna Hills, CA). CP low-risk patients were identified using a) RTOG-9804-like criteria [Nuclear Grade 1-2 & Size ≤2.5cm & non-Palpable & Screen Detected & margin negative (no-ink on tumor)] and b) MSKCC-like criteria [low-risk score< 220, determined using nomogram weighted factors (excluding: number of re-excisions and RT treatment), and using no-ink-on-tumor instead of close margin]. High-risk CP was defined as not meeting these criteria. The 7-gene biosignature combined seven biomarkers with the four CP factors (age, size, palpability, margin status) using an algorithm reporting a Decision Score (DS) and Residual Risk subtype (RRt). Women with high-risk CP were classified into biosignature Low Risk (DS≤2.8, no RRt) or High Risk (DS>2.8 +/- RRt). 10-yr IBR (DCIS/invasive) rates with and without RT were estimated with Kaplan-Meier and Cox proportional hazard analyses.

Results: Overall, 49% and 65% of patients were initially classified into the CP high-risk groups by RTOG-9804-like and MSKCC-like criteria, respectively. CP high-risk groups had 10-yr IBR rates of 24% and 21% after BCS without RT with an absolute 16% (p<.001) and 13% (p< 0.01) IBR rate reduction with RT. The biosignature High-Risk group (63%, n=588) had a 10-yr IBR risk of 25% after BCS alone with a significant RT benefit (10-yr IBR 8%, p<.001). The biosignature reclassified 23% and 36% of CP high-risk patients into the biosignature Low-Risk group respectively; these reclassified patients had low IBR rates without RT (5.9% and 6.8%) and a minimal, nonsignificant (2.9%, p=.5; 2%, p=.5) absolute IBR rate reduction with RT. CP high-risk patients with concordant biosignature High-Risk demonstrated significant RT benefit (Table 1). The 10-year IBR rates for CP high-risk patients in the Biosignature Low and High-risk groups were comparable to the 10-year IBR rates of Biosignature Low and High-Risk groups for all patients.

Conclusions: The 7-gene predictive biosignature more reliably identified patients who benefited from RT compared to using traditional high risk CP criteria (RTOG-9804-like, MSKCC-like). Importantly, CP high-risk patients who were re-classified as biosignature Low-Risk had low 10-yr IBR rates and no significant difference with versus without RT.

Table 1.

	All Patients					Classified as DCISionRT Low Risk (DS≤2.8 without RRt)					Classified as DCISionRT High Risk (DS>2.8 +/- RRT)				
	10-yr IBR rates					10-yr IBR rates					10-yr IBR rates				
		BCS No RT (95% CI)	BCS + RT (95% CI)	HR	P_{LR}		BCS No RT (95% CI)	BCS + RT (95% CI)	HR	P_{LR}		BCS No RT (95% CI)	BCS + RT (95% CI)	HR	P_{LR}
All Patients	n=926	17.3% (13%,23%)	6.9% (5,10%)	0.4	<0.001	338/926 (37%)	5.6% (3%,12%)	4.8% (3%,9%)	0.8	0.7	588/926 (63%)	25.7% (19%,34%)	8.0% (6%,12%)	0.3	<0.001
MSKCC-like high-risk (≥220)	n=606 (65%)	21.1% (15%,29%)	8.0% (5%,12%)	0.3	<0.001	220/606 (36%)	6.8% (3%,16%)	4.8% (2%,11%)	0.6	0.4	386/606 (64%)	30.2% (22%-41%)	9.2% (6%,15%)	0.3	<0.001
RTOG-9804 like high-risk	n=453 (49%)	23.6% (16%,33%)	7.6% (5%,12%)	0.3	<0.001	106/453 (23%)	5.9% (2%,22%)	3.0% (1%,12%)	0.5	0.5	347/453 (78%)	30.5% (21%,43%)	8.7% (6%, 14%)	0.2	<0.001

1688613 - Perception of Timely Breast Cancer Diagnosis and Treatment at NAPBC Centers

Danielle Thompson[1], Kristine Kuchta[2], Marie Fefferman[3], Sandra Simovic[2], Richard Bleicher[4], Lee Wilke[5], Katharine Yao[2]

[1]University of Chicago/NorthShore University HealthSystem, Chicago, IL, [2]NorthShore University HealthSystem, Evanston, IL, [3]The University of Chicago, Chicago, IL, [4]Fox Chase Cancer Center, Philadelphia, PA, [5]University of Wisconsin-Madison Medical Center, Madison, WI

Background/Objective: The aim of this study was to understand patient and breast center perception of timely breast care at National Accreditation Program for Breast Cancer (NAPBC) accredited centers from screening to first breast cancer treatment.

Methods: Centers submitted timeliness metrics from screening to first treatment in calendar days from 2019-2021 as part of a NAPBC quality collaborative called PROMPT (Patient Reported Observations on Medical Procedure Timeliness). The four timeliness metrics were screening mammogram (MGM) to diagnostic MGM, diagnostic MGM to biopsy, biopsy to neoadjuvant therapy and biopsy to first surgery. We also compiled patient perceptions on time intervals thru qualitative interviews. The number of days for each timeliness metric was compared to center and patient's perception of timely care.

Results: 373 centers enrolled in the PROMPT study and submitted timeliness metrics. Twenty-eight patients participated in qualitative interviews from 22 NAPBC sites. The median number of days from 2019 to 2021 was 11, 11 and 12 for screening MGM to diagnostic MGM; 8, 8 and 9 for diagnostic MGM to biopsy; 39, 40 and 42 for biopsy to surgery and 33, 32 and 34 for biopsy to neoadjuvant therapy. Centers and patients stated the time between a screening and diagnostic MGM should be a median of 7 days and 5 days respectively, approximately a week shorter than the time reported by sites. Centers and patients stated that the time between diagnostic MGM and biopsy should be a median of 7 days which was nearly the same as reported by sites (8-9 days). Centers and patients stated that the time between a biopsy and first surgery should be a median of 28 days and 21 days respectively, approximately 2-3 weeks shorter than reported by sites. Only 48 (15.2%) sites felt that the time interval between biopsy and treatment was longer than other sites. Patients stated that the time interval from biopsy to meeting a surgeon should be 7 days and meeting a surgeon to surgery should be 14 days. Centers stated that the time between a biopsy and neoadjuvant therapy should be a median of 21 days, approximately one week shorter than reported by sites.

Conclusions: NAPBC center and patient's opinions of time intervals between screening and treatment were all shorter than actual reported time intervals with the exception of time from diagnostic MGM to biopsy. Time to surgery was the longest time interval. Future quality initiatives are needed to improve the timeliness of breast cancer care.

Table 1: Breast cancer care timeliness metrics from patient and center perspectives

	Screening MGM to Diagnostic MGM	Diagnostic MGM to Biopsy	Biopsy to First Surgery	Biopsy to Neoadjuvant Therapy
Patient Perspective	*5 days*	*7 days*	*21 days*	*Not collected*
Center Perspective	*7 days*	*7 days*	*28 days*	*21 days*
Reported Timeliness Metrics				
2019	*11 days*	*8 days*	*39 days*	*33 days*
2020	*11 days*	*8 days*	*40 days*	*32 days*
2021	*12 days*	*9 days*	*42 days*	*34 days*

Poster Session and Reception

Friday, April 12, 2024, 6:15 pm–7:30 pm

Top 10

1683885 - Does the Number of Positive Nodes in pN1 Premenopausal HR+/HER2- Breast Cancer Patients with a Low 21-Gene Recurrence Score Predict Chemotherapy Benefit?

Kelly Kapp[1], Austin Williams[2], Jennifer Son[3], Lucy De La Cruz[1]

[1]Georgetown University Medstar, Washington, DC, [2]Fox Chase Cancer Center, Philadelphia, PA, [3]MedStar Georgetown University Hospital, Washington, DC

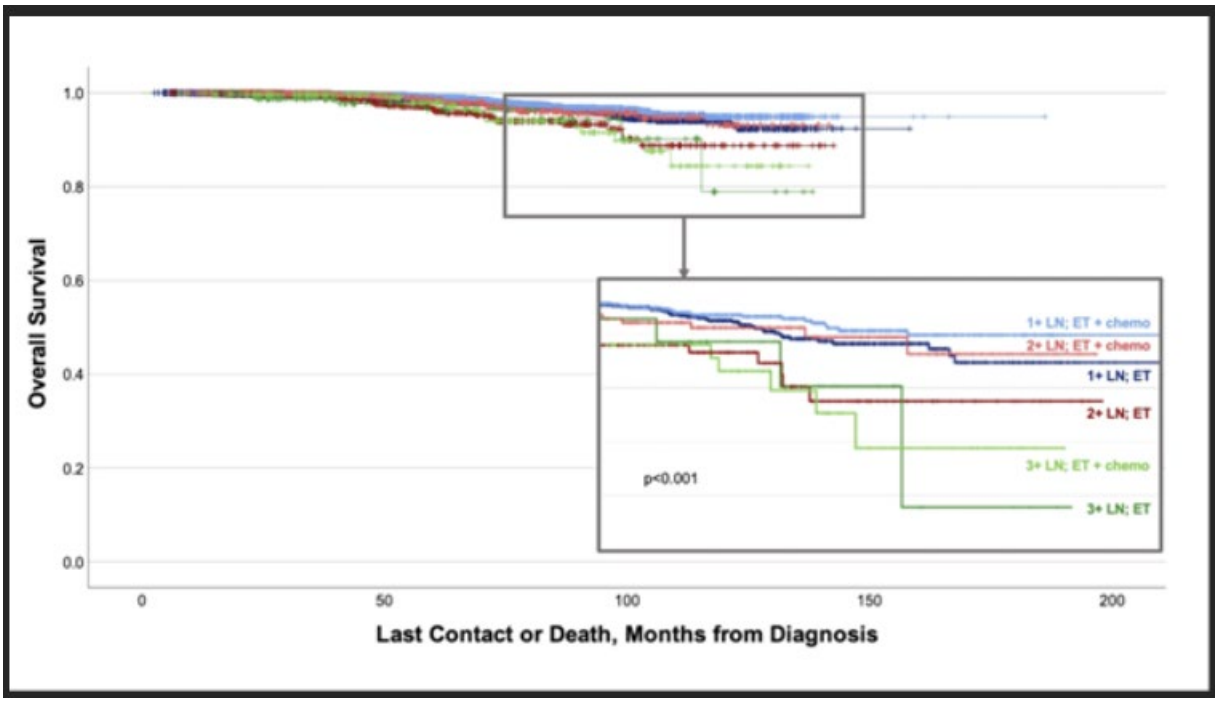
Background/Objective: The RxPONDER trial showed that premenopausal patients with pT1-2N1 HR+/HER2- breast cancer benefit from adjuvant chemotherapy regardless of 21-gene Recurrence Score (RS). The trial grouped all N1 patients, but patients with limited nodal disease may have more favorable biology than those with more extensive nodal involvement. We sought to evaluate if the number of positive nodes (+LNs) predicts chemotherapy benefit in pN1 premenopausal women with low RS.

Methods: From the National Cancer Database (2012-2020) we identified women aged < 50 (as proxy for menopausal status) with pT1-2 N1 HR+/HER2- breast cancer with a known RS. Patients were stratified based on RS (≤25 and >25) and number of +LNs (1-3). We analyzed the clinicopathologic features of these subgroups and the adjuvant systemic therapies received. We then compared overall survival (OS) between patients who received adjuvant combined chemoendocrine therapy vs. endocrine therapy alone stratified by number of +LNs. Multivariable Cox proportional hazards were used to estimate the impact of each factor on OS.

Results: We identified 12,017 women, 86% of whom had a RS< 25. Most patients (77%) had 1 +LN, while 18% had 2 +LNs and only 5% had 3 +LNs. Overall, 94% of patients received adjuvant endocrine therapy while 46% of patients underwent adjuvant chemotherapy (RS≤25: 39%, RS>25: 89%). Rates of endocrine therapy did not differ by number of +LNs while rates of chemotherapy were higher with increasing number of +LNs for those with RS≤25 (p< 0.001) but did not vary by number of +LNs in those with RS >25 (p=0.72). Focusing on patients with RS≤25, 38% had combined chemoendocrine therapy (the rates of which varied by number of +LNs: 1 +LN: 34%, 2 +LNs: 46%, 3 +LNs: 56%, p< 0.001). With a median follow-up of 59 months, unadjusted median OS was 178 months. OS differed when patients were grouped by number of +LNs and adjuvant treatment received (Figure, p< 0.001). OS was better in those with fewer +LNs, and when chemoendocrine therapy was used in each LN group (p< 0.001). On multivariable analysis (adjusting for other clinicopathologic features), factors associated with worse OS were Black race (HR 1.91), intermediate/high tumor grade (HR 1.93 and 3.75), T2 tumors (HR 1.59), having 2 or 3 +LNs (HR 1.53 and 2.17), the use of endocrine therapy alone (HR 1.64), and increasing RS (HR 1.08; all p< 0.05). Subset analyses of those with 1 +LN (for whom OS benefit of chemotherapy was least) were very similar, with the same independent predictors as the larger cohort.

Conclusions: Patients < 50 with pT1-2N1 HR+/HER2- breast cancer and RS≤25 have an OS benefit from combined adjuvant chemoendocrine therapy regardless of the number of +LNs. However, the OS benefit is least among patients with 1 +LN, and there may be a subset of these patients who derive a limited benefit from chemotherapy, and for whom risks outweigh benefits. Correlation of these findings with disease-free survival and other clinicopathologic features unavailable in this analysis may help to identify a subset of patients with low-risk disease who could safely avoid adjuvant chemotherapy.

Figure 1: Kaplan-Meier curves of overall survival among women with pT1-2N1 HR+/HER2- breast cancer and recurrence score ≤25 stratified by number of positive lymph nodes (LNs) and adjuvant systemic therapy [ET, endocrine therapy


Overall Survival
1.0
0.8
0.6
0.4
0.2
0.0
0
50
100
150
200
Last Contact or Death, Months from Diagnosis
1+ LN; ET + chemo
2+ LN; ET + chemo
1+ LN; ET
2+ LN; ET
3+ LN; ET + chemo
3+ LN; ET
p<0.001

1688529 - Integrated Genomic, Transcriptomic, and Epigenomic Analyses of HER2-low Tumors in Patients with Triple-negative Breast Cancer

Sookyung Ahn[1], Javier Orozco[2], Andres Bedoya-Lopez[3], Diego Marzese[4], Maggie DiNome[5]

[1]Duke University/Kangnam Sacred Heart Hospital, Hallym University, Durham, NC, [2]Saint John's Cancer Institute, Santa Monica, CA, [3]Health Research Institute of the Balearic Islands, Palma, Islas Baleares, Spain, [4]Duke University School of Medicine, Durham, NC, [5]Duke University Medical Center, Raleigh, NC

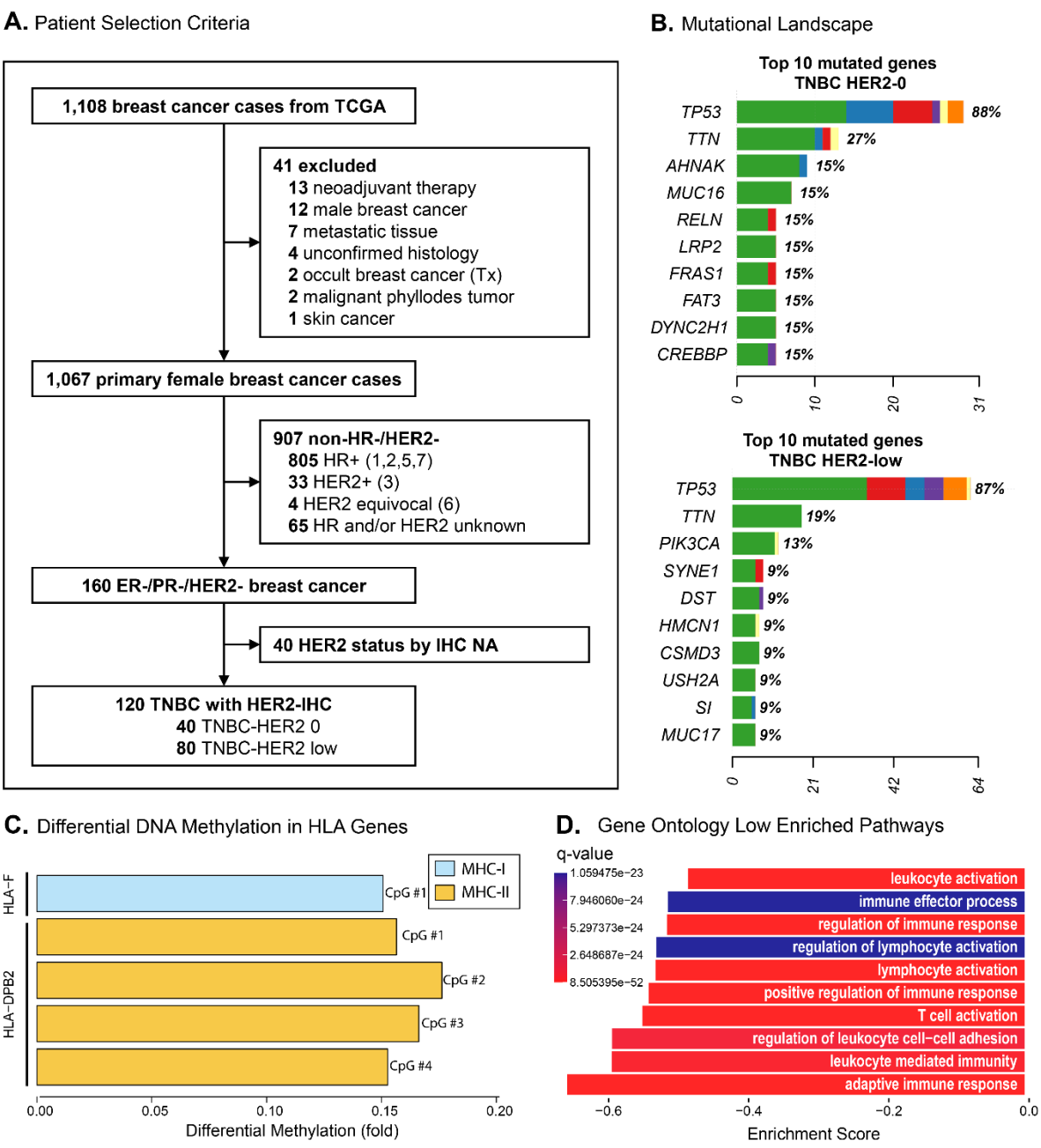
Background/Objective: Identifying therapeutic targets is a primary focus of research for patients with triple-negative breast cancer (TNBC), an aggressive tumor subtype that currently lacks treatment targets other than programmed death ligand 1 (PD-L1). Since studies with novel antibody-drug conjugates have shown significant improvement in survival for patients with HER2-low breast cancers, assessing HER2-status beyond "negative" appears to be a clinically relevant distinction that may prove consequential for patients, especially those with TNBC. However, further investigation is needed to better understand the biology and clinical significance of HER2-low expression in patients with hormone negative breast cancers. Here, we aimed to perform an integrated analysis of genomics, transcriptomics, and epigenomics in patients with TNBC-HER2-0 and TNBC-HER2-low.

Methods: We selected a cohort of female patients from The Cancer Atlas Genome (TCGA) with hormone receptor-negative/HER2-negative, histologically confirmed, non-metastatic invasive breast cancer. Two cohorts were created according to HER2 status: TNBC-HER2-0 (IHC 0) and TNBC-HER2-low (defined as HER2-IHC score of 1+ or 2+ without ERBB2 amplification by FISH assay). Gene mutation, DNA methylation, and gene expression datasets were obtained using the TCGAbiolinks package on the R/Bioconductor. The Consensus Tumor Purity Estimation (CPE) method was employed to select cases with at least 60% tumor content for gene expression and DNA methylation analyses.

Results: Of the 120 patients who met the study criteria, 40 patients (33.3%) were TNBC-HER2-0, and 80 (66.7%) patients were TNBC-HER2-low (Figure 1A). No significant differences between clinicodemographic variables were detected. Analysis of the mutational landscape showed that TNBC tumors classified as HER2-low had a significantly higher mutation frequency of the PI3KCA gene (13% vs. 1%; $p < 0.001$, Figure 1B). Epigenetic analysis employing DNA methylation distribution showed 946 differentially methylated sites (DMS >10%, $p < 0.001$), of which 758 showed an increased DNA methylation level on TNBC-HER2-low tumors. Amongst these DMS, we identified higher methylation of HLA genes, which are involved in antigen processing and presentation (Figure 1C). An additional comparison between the gene expression programs of these tumor types revealed 452 differentially expressed genes (FC > 1, $p < 0.01$), with 310 upregulated genes in TNBC-HER2-low. Importantly, in agreement with the epigenetic analysis, gene enrichment analysis to identify potentially active pathways revealed that TNBC-HER2-low tumors exhibited an immune evasive phenotype characterized by a gene expression profile associated with lower T-cell and leukocyte activation and decreased immune response ($p < 0.001$, Figure 1D).

Conclusions: Our study reveals distinct features in tumors classified as TNBC-HER2-low, including a higher frequency of PI3KCA mutations, a common alteration of hormone positive breast cancer tumors, altered DNA methylation levels in HLA genes, and immune-evasive gene expression patterns. Altogether, these findings suggest potential mechanisms of immune evasion in TNBC-HER2-low tumors and offer insights into the unique biology of this subtype, which may guide development of tailored treatment approaches.

Figure 1: Comprehensive molecular characterization of TNBC-HER2-0 and TNBC-HER2-low tumors



1683301 - Rurality and Income on Breast Cancer Outcomes: An Analysis of the SEER Database

Suniah Ayub[1], Lauren Postlewait[2], Clara Farley[3], Olivia Cheng[3], Caroline Fiser[3], Monica Rizzo[3], Toncred Styblo[3], Cletus Arciero[4]

[1]Emory University, Canton, GA, [2]Emory University School of Medicine, Atlanta, GA, [3]Emory University, Atlanta, GA, [4]Emory University Hospital, Atlanta, GA

Background/Objective: Disparate breast cancer outcomes have been reported in rural settings and for low-income patients. There are limited data on the interaction between rurality and income in breast cancer outcomes, particularly at the national level.

Methods: The NCI's SEER 17 Registry was queried for new breast cancer diagnoses from 2000-2020. Analysis was performed with SEER*Stat version 8.4.1. Location was defined according to SEER's Rural-Urban Continuum Code (RUCC), with urban=1-3 and rural=4-9. Annual income was defined in four brackets as <$35K, $35-50K, $50-75K, and >$75K. Data was stratified by rurality and income level.

Results: Of 936,629 breast cancer cases identified, 836,708 (89.3%) were urban and 99,921(10.7%) were rural. In urban settings, significantly more white (50.1%) and Asian (66.5%) patients made >$75K, while significantly more black (68.6%) and Hispanic (59.1%) patients made <$75K ($p< 0.01$). Similarly, in rural settings, black (84.7%) and Hispanic (56.8%) patients were significantly more likely to make <$50K compared to white (47.8%) and Asian (9.0%) patients ($p< 0.01$). Most patients were diagnosed at ages < 60 years (44.2%). In urban settings, the proportion diagnosed before the age of 60 increased significantly with income (36.1% for <$35K vs 45.4% for >$75K, $p< 0.01$). There were no significant differences in rates of male breast cancer in urban or rural settings across incomes (< 1%, $p>0.05$). Most patients were treated within 3 months of diagnosis (97% urban, 98.5% rural). Most diagnoses were staged as "localized breast cancer" (59.6-68.6%). Rates of regional and distant disease were significantly higher in incomes <$35K in urban (31.3% regional, 7.2% distant, $p< 0.01$) and rural settings (32.9% regional, 7.5% distant, $p< 0.01$) compared to higher income patients. In terms of tumor biology, most cases were hormone receptor (HR) positive and Her2 negative (47%). Compared to >$75K, significantly more patients with income <$35K had triple-negative breast cancer (TNBC) in urban (10.8% vs 6.1%, $p< 0.01$) and rural (9.5% vs 5.6%, $p< 0.01$) settings. Significantly higher rates of triple-positive breast cancer (TPBC) were seen in incomes <$50K in urban (8.1% vs 6.7%, $p< 0.01$) and rural settings (7.0% vs 5.9%, $p< 0.01$). 5-year overall survival, relative survival, and disease-specific survival were significantly lower in <$35K vs >$75K in urban (74.4% vs 85.5%; 88.4% vs 92.1%; 83.4% vs 90.8%, $p< 0.05$) and rural settings (75.6% vs 84.9%; 84.6% vs 91.3%; 84.0% vs 90.5%, $p< 0.05$).

Conclusions: Among breast cancer patients in urban and rural settings, there are disparities in income levels associated with race. Lower-income patients in both settings were less likely to be diagnosed before the age of 60, more likely to have regional or distant disease, and more likely to have an aggressive subtype (TNBC, TPBC). There were no significant differences in rates of male breast cancer between income strata and urban/rural settings. Overall, relative- and disease-specific survival were significantly lower in <$35K incomes in both settings. The complex interaction between rurality and income in terms of breast cancer outcomes merits additional study, but income level alone is a significant factor in disparate outcomes regardless of rural-urban classification.

1679157 - The Utility of Routine Clinical Breast Examination for High-risk Patients in the Modern Era

Tien Hua[1], Morgan McCririe-Balcom[2], Sergio Mendoza[3], Jesse Kelley[4], G. Paul Wright[4], Jessica Thompson[4]

[1]Michigan State University College of Human Medicine, Grand Blanc, MI, [2]Michigan State University College of Human Medicine, Traverse City, MI, [3]Michigan State University College of Human Medicine, Grand Rapids, MI, [4]Michigan State University College of Human Medicine, Corewell Health West, Grand Rapids, MI

Background/Objective: For women at increased risk of breast cancer development, NCCN guidelines recommend clinical encounters every 6 to 12 months in order "to maximize earliest detection of breast cancers and assure ongoing risk assessment". In the interest of patient and provider safety during the COVID-19 pandemic, many healthcare systems implemented telemedicine as an alternative option to in-person examinations. While there are many advantages associated

with virtual visits, the appropriateness and impact of omitting routine clinic breast exams (CBE) for high-risk patients has been questioned. A recent systematic review reported that the sensitivity of CBE (40-69%) is lower than screening mammography (77-95%). Taking into consideration that accessibility to advanced breast imaging continues to readily increase, our study aimed to assess the conventional merit of regular CBE for breast cancer detection among the high-risk breast cancer patient population.

Methods: Following IRB approval, an institutional cancer database was utilized to retrospectively identify biological women >18 years with at least one documented high-risk encounter at Corewell Health West between 1/1/2018 and 12/31/22. High-risk was defined as known genetic predisposition, 5-year risk >1.7% and/or lifetime risk >20% based on Tyrer-Cuzick and/or Gail Model estimations, thoracic radiotherapy receipt before age 30, history of lobular carcinoma in-situ and/or atypical hyperplasia. Patients with a history of breast cancer or bilateral prophylactic mastectomy prior to 2018 were excluded.

Results: Of the 2524 women meeting inclusion criteria, 39 (1.5%) were diagnosed with breast cancer during the study period. Of the 39 individuals with a cancer diagnosis, 1 (2.6%) was detected by CBE, 10 (25.6%) were self-reported, and 28 (71.8%) were image-detected. The cohort of women with cancer had a combined total of 124 high-risk encounters during the study period with an average of 4.3 visits per individual. Twenty-seven of the 28 women (96.4%) with image-detected cancer had no detectable clinical findings at the time of their preoperative consultation. The individual with CBE-detected cancer was a BRCA1 carrier, and of the self-reported breast cancers, 6 (60%) had a pathogenic mutation (5 BRCA1/2, 1 PALB2). Conversely, 16 (57.1%) women with screen-detected cancers had negative genetics. All 11 self-reported and CBE-detected cases were invasive carcinoma (10 ductal, 1 mixed). Of the 28 image-detected cases, 20 were invasive carcinoma and 8 were ductal carcinoma in-situ. Self-reported and CBE-detected cancers were more likely to be of higher clinical stage (four stage I, six stage II, one stage III) compared to image-detected malignancies (ten stage 0, fourteen stage I, four upstaged from excisional breast biopsy).

Conclusions: In a cohort of 2524 high-risk women, CBE resulted in 1 (0.03%) cancer diagnosis compared to 28 (1.1%) detected with screening imaging and 10 (0.4%) self-reported. The role of routine CBE as a cancer detection modality in the high-risk patient population appears to be limited. While in-person accessibility to specialized care remains inequitable, virtual visit offerings may be an acceptable alternative for individuals who have completed screening imaging but are otherwise unable to commit to or are inconvenienced by in-person high-risk breast cancer assessments.

1684236 - Prospective Evaluation of Targeted Axillary Dissection in Breast Cancer Patients with Advanced Nodal Disease

Neha Goel[1], Kristin Rojas[1], Jessica Crystal[1], Isildinha Reis[2], Jose Net[1], Carmen Gomez-Fernandez[3], Susan Kesmodel[1]

[1]UMiami, Sylvester Comprehensive Cancer Center, Miami, FL, [2]Sylvester Comprehensive Cancer Center, Miami, FL, [3]University of Miami School of Medicine, Miami, FL

Background/Objective: Multiple clinical trials have demonstrated that false negative rates (FNR) of < 10% can be achieved with targeted axillary dissection (TAD)/sentinel lymph node biopsy (SLNB) after neoadjuvant chemotherapy (NAC) in breast cancer (BC) patients with clinical N1 (cN1) disease at diagnosis. However, this procedure has not been well-validated in BC patients with advanced nodal disease. We conducted a prospective clinical protocol to evaluate the success and FNR of TAD after NAC in BC patients with advanced nodal disease at diagnosis.

Methods: BC patients from February 2022-June 2023 with biopsy-proven cN2/3 disease at diagnosis with a plan for NAC and axillary lymph node dissection (ALND) were offered enrollment in this study evaluating TAD prior to ALND. SLN mapping was performed using dual tracers (radiotracer + blue dye) and the clipped axillary lymph node (CLN) was localized for every patient. The rates of CLN removal, SLN identification, and lymph node (LN) positivity were evaluated. A false negative was defined as retrieval of a negative CLN and/or SLN in the setting of any positive residual nodes. Using these definitions, FNRCLN, FNRSLN, and FNRCLN+SLN were calculated.

Results: Ten patients who met inclusion criteria were enrolled and underwent surgery. All patients were women, median age was 54 years (range 39-70), 80% were White, and 40% Hispanic. (Table 1) Most had cT2/3 (90%) tumors, 50% had cN3 disease, 70% of tumors were grade 3, and 50% of tumors were triple negative (TN). All patients received multiagent chemotherapy and immunotherapy or targeted therapy based on tumor subtype. Three patients (30%) with TNBC had a pathologic complete response (pCR) and 7 patients (70%) had residual axillary disease (AD). The CLN was removed in all 10 patients. In 6 of 7 patients (85.7%) with residual AD the CLN was positive and in 1 of 7 it was negative (FNRCLN 14.3%). A SLN was identified in 6 patients (SLN identification rate 60%; the 3 patients with pCR and 3 of 7 patients (42.9%) with residual AD). In all 6 patients where the CLN was positive, it was not a SLN. In the 3 patients with residual AD where a SLN was identified, 2 of 3 SLNs were positive (66%) and 1 was negative (FNRSLN 33%). In the 1 patient with residual AD with a negative CLN, the SLN was positive. Therefore, in all 7 patients with residual AD, a positive CLN or SLN was identified (FNRCLN+SLN 0%). In the 7 patients with residual AD, the median number of positive LNs was 4 (range 1-9).

Conclusions: In this prospective pilot study of TAD in BC patients with advanced nodal disease, removal of the CLN alone resulted in a FNR of 14.3% while removal of the CLN+SLN resulted in a FNR of 0%. SLNB alone was not consistently successful, especially in patients with residual AD. Therefore, outside of a clinical trial, TAD/SLNB alone should not be routinely utilized after NAC in BC patients with advanced nodal disease at diagnosis.

Table 1: Clinicopathologic features of the study cohort

	Patients N=10
Age, median (range)	54 (39-70)
Race	
White	8
Black	1
Asian	1
Race	
Non-Hispanic	6
Hispanic	4
Clinical T	
1	1
2	5
3	4
Clinical N	
2	5
3	5
Grade	
2	3
3	7
Breast Cancer Subtype	
ER+/HER2-[a,b]	4
HER2+	1
TN[c]	5
Clinical Response to NAC[d]	
Breast cCR[e]	6
Axilla cCR	7
Breast Surgery	
Mastectomy	9
Lumpectomy	1
yPathologic T	
0	4
1	3
2-3	3
yPathologic N	
0	3
1	2
2	5
TAD[f] Results	
CLN[g] removed	10
SLN[h] identified	6
CLN positive	6
CLN = SLN	0
No additional LN+[i]	1
Additional SLN+/NSLN+[j]	1
Additional NSLN+	4
CLN negative	4
CLN = SLN	4
Additional SLN+/NSLN+	1

[a]ER=estrogen receptor, [b]HER2=human epidermal growth factor receptor-2, [c]TN=triple negative, [d]NAC=neoadjuvant chemotherapy, [e]cCR=clinical complete response, [f]TAD=targeted axillary dissection, [g]CLN=clipped lymph node, [h]SLN=sentinel lymph node, [i]LN=lymph node, [j]NSLN=non-sentinel lymph node

1688054 - Trends in Management and Related Outcomes for Occult Primary Breast Cancer

Michelle LaBella, Julia Selfridge, Rachel Lile-King, Chris Agala, Philip Spanheimer, David Ollila, Kristalyn Gallagher

UNC Hospitals, Chapel Hill, NC

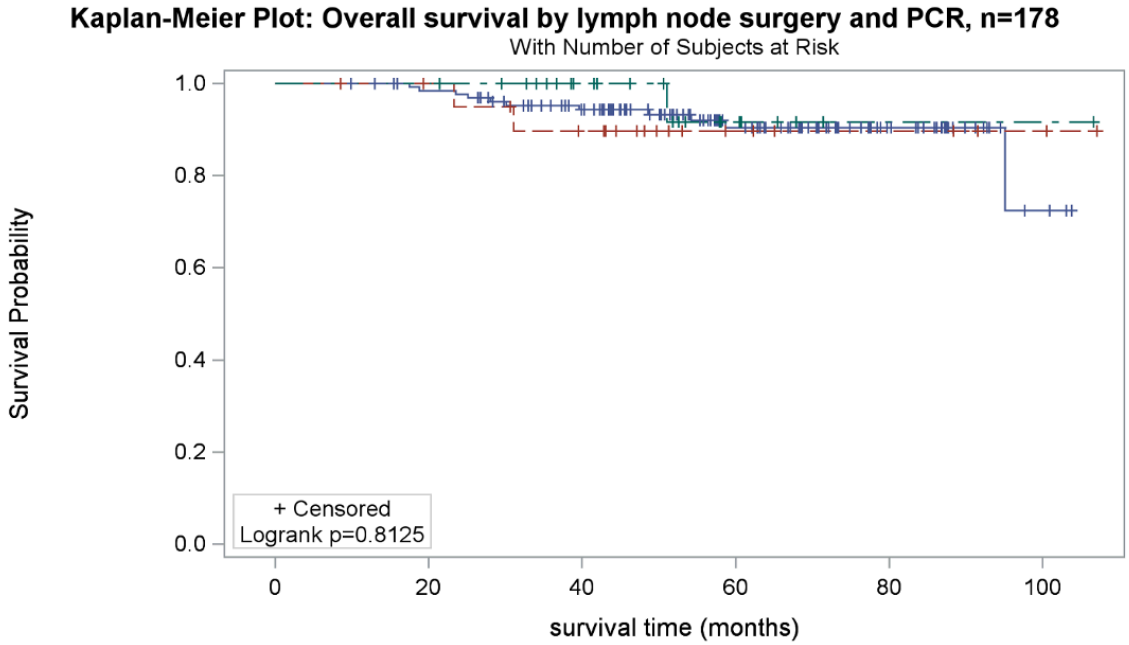
Background/Objective: Occult Primary Breast Cancer (OCPB) is a rare disease in which breast cancer is identified within the axillary lymph nodes, but no primary tumor is located within the breast. Historically, axillary management of these patients consisted of an axillary lymph node dissection (ALND). However, with increasing use of sentinel lymph node biopsy (SLNB) after neoadjuvant systemic therapy, we sought to explore the recent utilization of different axillary procedures in OCPB as well as outcomes for these patients.

Methods: The National Cancer Database was used to identify adult women diagnosed with non-metastatic breast cancer with nodal disease but no primary tumor (cT0N1-3M0) between the years 2010 to 2019 that underwent axillary lymph node surgery. Characteristics of participants and their outcomes were described using frequencies and percentages and measures of central tendency, including, mean, standard deviation, median and interquartile range. The Kaplan-Meier curves were used to estimate the survival function between groups by type of lymph node surgery, with between group comparisons being performed using Logrank test.

Results: 1607 patients met criteria for inclusion. At presentation, 68.2% of the ALND group met cN1 status, while 71.0% of the SLNB+ALND and 82.8% of SLNB patients were cN1. The median age at diagnosis was 61. 86.3% of patients underwent ALND in 2012 and this decreased to 75.4% in 2017. SLNB+ALND use increased from 8.7% to 15.5% of patients during this period, and SLNB similarly increased from 5.0% to 9.1% (p=0.0003). 25.3% of ALND patients received neoadjuvant chemotherapy (NAC) while 38.1% of SLNB+ALND patients and 42.5% of SLNB patients underwent NAC. 41.6% of the ALND group received radiation, while 50.3% of SLNB+ALND patients and 47.1% of SLNB patients received this therapy. HER2 positivity was similar between groups (25.9% ALND vs 32.4% SLNB+ALND vs 27.6% SLNB) as well as triple negative receptor status (23.3% ALND vs 21.0% SLNB+ALND vs 29.9% SLNB). Only 9.8% of ALND patients had nodal pathologic complete response (PCR), compared to 12.5% of SLNB+ALND patients and 27.6% of SLNB only patients. For patients with nodal PCR, there was no difference in overall survival between ALND, ALND+SLNB, and SLNB alone groups (p=0.81) (Figure 1).

Conclusions: Most patients diagnosed with OPBC were treated with ALND, with a modest increase towards SLNB use during the study period. The nodal PCR rate was low within the ALND group when compared to the SLNB only group. Of the limited data available, there was no difference in overall survival with respect to axillary surgical procedure in our patient population for patients with nodal PCR after NAC. This suggests that for carefully selected OPBC patients with an excellent clinical response to NAC, omission of ALND may be considered if PCR is noted on SLNB.

Figure 1: Overall survival for patients with nodal pathologic complete response treated with sentinel lymph node biopsy (SLNB), SLNB with axillary lymph node dissection (ALND), and ALND alone



1684573 - Evaluating Genomic Profiling Patterns of Use in Women with Hormone Receptor-positive, HER2-negative Breast Cancer in Clinical T1-2N1 or T3N0 Disease

Ashley Martin

Atrium Health Carolinas Medical Center, Clover, SC

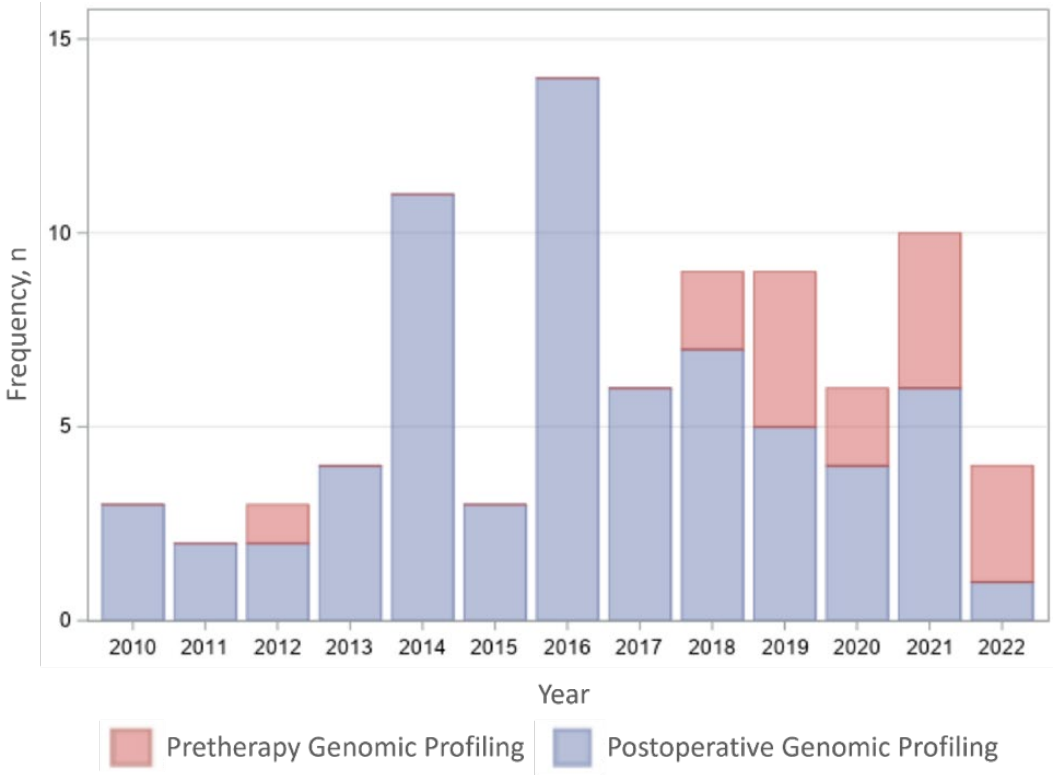
Background/Objective: The use of genomic profiling via multigene assays (Oncotype DX® and MammaPrint®) in early-stage breast cancer can be predictive of adjuvant therapeutic benefit. We have identified a subset of patients with breast cancer that are HR-positive, HER2-negative, and clinically T1-2N1 or T3N0 who pose a clinical conundrum in determining the optimal timing of surgery and systemic therapy. Preoperative systemic therapy should be considered in patients with cN+ disease along with cT1-3 patients who desire breast conservation but are not initially candidates. However, it is not clear that all patients who fit these criteria derive benefit from neoadjuvant chemotherapy. Though not validated in the neoadjuvant setting, genomic profiling has been used in clinical practice to guide decision-making regarding order of therapy. In this study, we evaluate patterns of use of genomic profiling in this population and investigate if results are associated with type of axillary and breast surgery.

Methods: This retrospective observational study at a single institution included adult women with HR+/HER2-, cT1-2N1 or cT3N0 breast cancer between January 1, 2010 and September 29, 2022, who underwent genomic profiling and surgical intervention. Rates of genomic profile timing were summarized by year. Rates of axillary and breast surgery type were compared to genomic profile results and timeframe. Clinical and demographic characteristics were compared across the pretherapy and postoperative cohorts. Pretherapy profiling was defined as performed before therapy (chemotherapy or surgery). High-risk genomic profile results were defined as greater than 26 (Oncotype DX®) and High-Risk (MammaPrint®). Cochran-Armitage trend, Chi-squared, and Fisher's exact tests were used.

Results: Of the 84 patients included in the study, 80% were White, 16% Black, and 4% Other. Median age at diagnosis was 60 years (range, 35-81). The rate of pretherapy genomic profiling significantly increased over the study period ($P < .001$). Axillary surgery was not significantly associated with the timing of genomic profiling (SLNB: 87.5% pre, 77.9% post; ALND: 12.5% pre, 22.1% post; $P=0.51$). Breast surgery was significantly associated with the timing of genomic profiling, favoring BCT in the pretherapy cohort (BCT: 81.2% pre, 47.1% post; TM: 18.8% pre, 52.9% post; $P=0.02$). In patients with pretherapy profiling, 43.8% had neoadjuvant chemotherapy and 56.3% underwent upfront surgery. Neoadjuvant chemotherapy was more frequently administered when pretherapy genomic profiling resulted as high-risk (85.7% vs 14.3%, $P =0.04$).

Conclusions: Our study demonstrates an increasing trend in use of pretherapy genomic profiling over time, which is consistent with observed clinical trends. Over 50% of patients underwent upfront surgery when pretherapy genomic profiling was used to guide decision-making, who would have otherwise been offered neoadjuvant chemotherapy. We observed de-escalation of breast specific surgery in more patients with pretherapy genomic profiles. Although, axillary surgery was not associated with genomic profile timing in the overall cohort, the pretherapy use of profiling may have influenced neoadjuvant chemotherapy recommendations over upfront surgery, with de-escalation of surgical therapy seen in the pretherapy cohort. Overall, pretherapy genomic profiling may be useful in guiding timing of surgical and systemic therapy recommendations in this challenging patient population. Further large-scale studies are required.

Figure 1: Genomic profiling timing trend by year



1688518 - Implementation of Choosing Wisely Recommendations for Lymph Node Surgery in Male Breast Cancer

Catherine Pratt, Jenna Whitrock, Michela Carter, Jaime Lewis, Alicia Heelan

University of Cincinnati College of Medicine, Cincinnati, OH

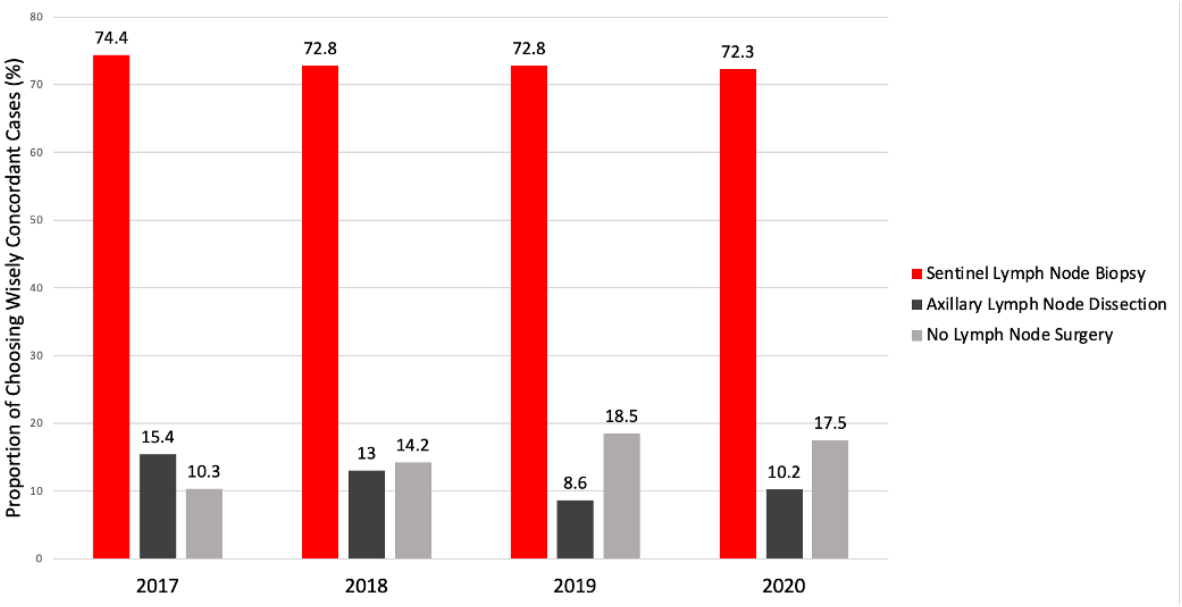
Background/Objective: In 2016, the Choosing Wisely (CW) campaign identified certain breast cancer operations as low-value and recommended deimplementation of surgical management of axillary nodes in specified patient populations. The CW campaign recommended against (1) axillary lymph node dissection (ALND) for limited nodal disease in patients receiving lumpectomy and radiation, and (2) sentinel lymph node biopsy (SLNB) in patients ≥70 years with hormone receptor–positive, HER2-negative breast cancer. While studies exist evaluating the deimplementation of these lymph node (LN) procedures for females, no analogous studies exist for male patients. This study aimed to assess trends in the application of these recommendations for deimplementation of LN surgery in males with breast cancer.

Methods: The NCDB was queried for males diagnosed with breast cancer from 2017 to 2020. Patients were categorized into two cohorts based on CW criteria 1 and 2, as defined above. Cohort 1 included all patients with T1-2, clinically node negative breast cancer who underwent breast conserving therapy with planned whole breast radiation and ≤2 positive nodes. Cohort 2 included all patients ≥70 years with T1-2, node negative, hormone-positive, HER2-negative breast cancer. In Cohort 1, those who underwent SLNB alone (CW concordant) were compared to those who underwent ALND or omission of LN surgery. In Cohort 2, those who underwent LN surgery were compared to those with omission of LN surgery (CW concordant).

Results: A total of 617 patients met the criteria for Cohort 1. Of these, 73.1% underwent SLNB alone, compared to 11.8% (ALND) and 15.1% (no LN surgery). Those who received SLNB alone were younger (median [Interquartile Range, IQR] 65 [58-72] vs 68 [58.5-77.6] vs 73 [64.5-85.6], $p< 0.001$) and were more likely to have private insurance (43.8% vs 41.7% and 24.7%, $p=0.0036$) than those who received ALND or no LN surgery. There was no significant difference between groups regarding race, type of cancer program, rural-urban influence, or Charlson/Deyo score. Since CW guideline publication, the annual proportion of males who underwent SLNB alone (CW concordant) remained stable (Figure). A total of 1,572 patients met the criteria for Cohort 2. Of these, 84.3% received LN surgery. Those for whom LN surgery was omitted were older (median [IQR] 81 [76-87] vs 77 [73-81], $p< 0.001$) than those who underwent LN surgery. There was no significant difference between groups regarding race, type of cancer program, insurance status, rural-urban influence, or Charlson/Deyo score. Since CW guideline publication, the proportion of elderly males with early-stage breast cancer who underwent LN surgery (CW disconcordant) has increased.

Conclusions: This study demonstrates a consistent proportion of males with breast cancer are undergoing management different from the published Choosing Wisely campaign recommendations. In the two recommendations evaluated, most males receive more invasive LN surgery in comparison to what is recommended in the campaign. These findings reinforce the need for additional high-level data to define the optimal treatment strategy and application of axillary surgery deimplementation for males diagnosed with breast cancer.

Figure 1: Lymph node surgery approach in males who underwent breast-conserving therapy following Choosing Wisely guideline publication



1686222 - Staged Nipple Delay Procedure Expands Candidacy for Nipple-sparing Mastectomy

Xuanji Wang[1], Alice Chung[2], Armando Giuliano[2], Farin Amersi[2], Marissa Boyle[2], Jordan Jackson[2], Christina Weed[1], Theodore Hu[3], James Mirocha[2]

[1]Cedars-Sinai, Los Angeles, CA, [2]Cedars Sinai, West Hollywood, CA, [3]UCLA School of Medicine, Los Angeles, CA

Background/Objective: Nipple sparing mastectomy (NSM) has been adopted as a surgical technique to preserve the nipple-areolar-complex (NAC) and to offer superior aesthetic outcomes compared to skin sparing mastectomy. However, surgeons hesitate to offer patients NSM who have had prior breast operations, previous breast/chest wall radiation, high body mass index (BMI) or smoke due to increased risk for NAC necrosis. Nipple delay (ND) is a staged procedure that improves NAC perfusion in high risk NSM patients. This study compared postoperative outcomes between patients treated with ND followed by NSM (ND-NSM) and NSM alone.

Methods: Patients who underwent ND-NSM or NSM alone from 2009-2022 were identified from a prospectively maintained institutional database. Patient demographics, risk factors for NAC necrosis, tumor characteristics, treatment factors, and surgical outcomes were compared. Univariate and multivariate analyses were performed to identify significant variables associated with skin and NAC necrosis.

Results: Among 608 patients, 118 breasts had ND-NSM, and 954 breasts had NSM alone. There were no differences between groups with regards to age, BMI, diabetes, cardiovascular risk factors, exogeneous steroid use, autoimmune disorder, and smoking status. The ND-NSM group had higher rates of prior breast/chest wall radiation (7.6% vs. 2.1% $p< 0.01$), and prior breast operations (50% vs. 23.1% $p< 0.01$). Compared to NSM, the ND-NSM cohort was less likely to undergo axillary surgery (39% vs. 55.7% $p< 0.01$) and was more likely to have autologous tissue reconstruction over implant-based reconstruction (16.9% vs. 6.5% $p< 0.01$). For 90-day post-operative complications, there were no differences between groups with respect to infection, skin necrosis, NAC necrosis, and seromas requiring aspiration. There was higher risk for hematoma requiring operative evacuation in the ND-NSM cohort compared to the NSM cohort (4.2% vs. 0.9%, $p< 0.01$). Notably, there were no cases of NAC necrosis in the ND-NSM group versus 19 (1.9%) breasts in the NSM group ($p=0.18$). Four of the breasts with NAC necrosis in NSM group required operative debridement with nipple resection. Only 1 (0.8%) breast had skin necrosis in ND-NSM cohort compared to 14 (1.5%) in the NSM cohort ($p=0.50$) On univariate analysis, only history of breast/chest wall radiation was associated with a significant risk for skin necrosis ($p=0.023$). Multivariate regression analysis showed that prior breast/chest wall radiation was associated with increased risk of skin necrosis (OR=6.92, 1.31-36.99, $p=0.023$) and skin/NAC necrosis (OR=5.12,1.48-17.68, $p=0.01$).

Conclusions: ND-NSM was performed in more breasts that were previously radiated, and this cohort represents patients at increased risk for skin/NAC necrosis. Despite the greater risk in the ND-NSM group, higher rates of necrosis were not observed, and no nipples were lost. This suggests that NSM can be offered to patients at increased risk for skin and NAC necrosis, but at the potential risk of more hematomas. A shared decision should be made with patients based on the risks and benefits.

Table 1: Clinical features and postoperative complications of nipple delay and nipple-sparing mastectomy

	ND-NSM		NSM		*P*	
	Patients (n=63)	Breasts (n=118)	Patients (n=545)	Breasts (n=954)	By Patient	By Breast
Demographics						
Age (yr)	49.4	49.2	48.7	48.2	0.61	0.3
Body Mass Index, n (%)					0.08	0.58
>=30	9 (14.3)	8 (6.8)	43 (7.9)	79(8.3)		
<30	54 (85.7)	110 (93.2)	503 (92.1)	875 (91.7)		
Smoking, n (%)					0.65	0.58
yes	2 (3.2)	4 (3.4)	24 (4.4)	43 (4.5)		
no	61 (96.8)	114 (96.6)	521 (95.6)	911 (95.5)		
Diabetes, n (%)						
yes	2 (3.2)	4 (3.4)	19 (3.5)	33 (3.5)	0.9	0.97
no	61 (96.8)	114 (96.6)	526 (96.5)	921 (96.5)		
Cardiovascular Risk Factors, n (%)						
yes	1 (1.6)	2 (1.7)	19 (3.5)	31 (3.2)	0.9	0.97
no	62 (98.4)	116 (98.3)	526 (96.5)	923 (96.8)		
Exogenous Steroid Use						
yes	0 (0)	0 (0)	5 (0.9)	8 (0.8)	0.9	0.97
no	63 (100)	118 (100)	540 (99.1)	946 (99.2)		
Autoimmune Disorder, n (%)						
yes	4 (6.3)	8 (6.8)	28 (5.1)	52 (5.5)	0.68	0.55
no	59 (93.7)	110 (93.2)	517 (94.9)	902 (94.5)		
History of Breast/Chest Radiation, n (%)					<0.01*	<0.01*
yes	9 (14.3)	9 (7.6)	19 (3.5)	20 (2.1)		
no	59 (93.7)	109 (92.4)	526 (96.5)	934 (97.9)		
Prior Breast Surgery, n (%)					<0.01*	<0.01*
None	27 (42.9)	59 (50)	418 (76.6)	734 (76.9)	<0.01*	<0.01*
Augmentation	10 (15.9)	21 (17.8)	32 (5.9)	57 (6)	<0.01*	<0.01*
Reduction/Mastopexy	8 (12.7)	16 (13.6)	2 (0.4)	4 (0.4)	<0.01*	<0.01*
Excision/Segmental Mastectomy	18 (28.6)	22 (18.6)	93 (17.1)	159 (16.7)	0.03*	0.59
Neoadjuvant Therapy, n (%)					0.95	0.7
Yes	11 (17.5)	20 (16.9)	104 (19.1)	193 (20.2)		
No	52 (82.5)	98 (83.1)	441 (80.9)	761 (79.8)		
Axillary Surgery, n (%)					<0.01*	<0.01*
None	17 (27)	72 (61)	30 (5.5)	423 (44.3)	<0.01	<0.01*
SLNB	39 (61.9)	39 (33.1)	394 (72.3)	407 (42.7)	0.09	0.04*
SLNB + ALND	7 (11.1)	7 (5.9)	121 (22.2)	124 (13)	0.04*	0.03*
Type of Reconstruction, n (%)					<0.01*	<0.01*
Tissue Expander	48 (76.2)	91 (77.1)	440 (80.7)	778 (81.5)	0.62	0.5
Direct to Implant	2 (3.2)	4 (3.4)	62 (11.4)	103 (10.8)	0.05	0.01*
Autologous Tissue	11 (17.5)	20 (16.9)	36 (6.6)	62 (6.5)	<0.01*	<0.01*
Unknown/No Reconstruction	2 (3.2)	3 (2.5)	7 (1.3)	11 (1.2)	-	-
Postoperative Outcomes						
Complications, n (%)					0.61	0.05
None	51 (81)	103 (87.3)	444 (79.6)	842 (87)	0.92	0.76
Infection	7 (11.1)	7 (5.9)	61 (10.9)	71 (7.3)	0.85	0.44
Skin Necrosis	1 (1.6)	1 (0.8)	13 (2.3)	14 (1.5)	0.69	0.59
Nipple-areolar-complex Necrosis	0 (0)	0 (0)	17 (3)	19 (2)	0.04*	0.04*
Seroma (requiring aspiration)	1 (1.6)	2 (1.7)	14 (2.5)	14 (1.4)	0.63	0.85
Hematoma (requiring evacuation)	3 (4.8)	5 (4.2)	9 (1.6)	8 (0.8)	0.09	<0.01*

p values with * are significant

1685100 - Extreme Oncoplasty versus Mastectomy: Equal Recurrence and Survival, Better Cosmesis

Deena Hossino[1], Nirav Savalia[2], Sadia Khan[2], Melvin Silverstein[2]

[1]University of Southern California/Hoag Memorial Hospital, Los Angeles, CA, [2]University of Southern California/Hoag Memorial Hospital, Newport Beach, CA

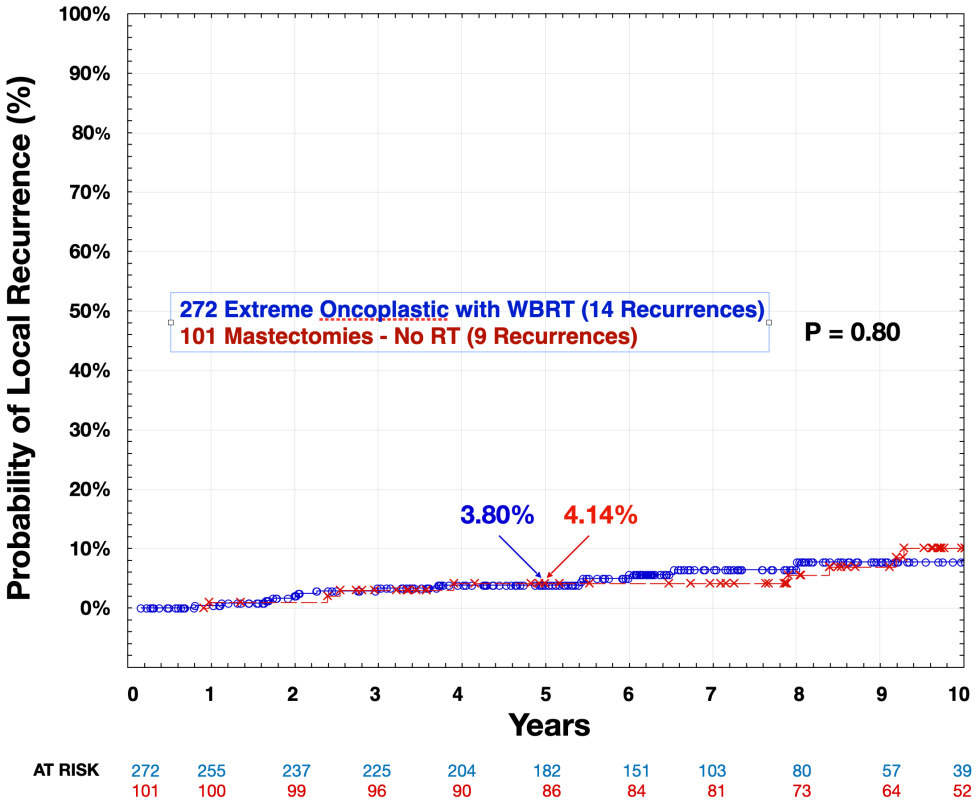
Background/Objective: Extreme oncoplasty is a breast conserving operation using oncoplastic techniques in a patient who does not meet the traditional criteria for breast conservation and in whom, most physicians would suggest a mastectomy. These tumors are larger than 50mm, generally multicentric and/or multifocal, or they can be large recurrences in a previously irradiated breast. The term extreme oncoplasty was published and coined in 2015, although we been performing the procedure since 2008.

Methods: A prospective database was queried for patients treated at a single institution from 2008 to the present who met the criteria for extreme oncoplasty and received whole breast treatment, either: excision plus whole breast radiation therapy (WBRT) or mastectomy. This group totaled 373 patients: 272 patients were treated with oncoplastic mammaplasty, using a standard or split reduction excision followed by post-operative WBRT; 101 patients elected to be treated with mastectomy without additional radiation therapy. Endpoints were local, regional, and distant recurrence as well as breast cancer specific survival and overall survival. Kaplan-Meier Analyses were used to predict recurrence and survival probabilities. Curves were compared with the log-rank test.

Results: Tumor span was similar for both groups: 77 mm for mastectomy and 74 mm for extreme oncoplastic cases (p = ns). With a median follow-up of 7 years, there were no significant differences in local, regional, or distant recurrence, nor in breast cancer specific survival or overall survival. Among the 272 patients treated with extreme oncoplasty and WBRT, there were 14 local recurrences and 9 deaths, 5 of which were breast cancer related. Among the 101 patients treated with mastectomy, there were 9 local recurrences and 3 deaths, 2 of which were breast cancer related. The predicted local recurrence rate at 5-years for the extreme oncoplastic group was 3.80%; for the mastectomy group it was 4.14% (p =0.80) (Figure 1). The overall survival at 7-years was 96.7% for the extreme oncoplastic group and 98.0% for the mastectomy group (p = 0.35).

Conclusions: Many patients with breast cancer who do not meet traditional criteria for breast conservation are offered mastectomy as the only surgical option. In many cases, this deforming, life-changing operation is unnecessary, is over-treatment, and offers no recurrence or survival benefit when compared with extreme oncoplasty plus WBRT. Extreme oncoplasty offers far superior cosmetic results and consequently superior psychological outcomes and patient satisfaction. This study shows equivalency of local recurrence, regional recurrence, distant recurrence, breast cancer specific survival, and overall survival for patients with multicentric/multifocal tumors larger than 50 mm, regardless of surgical management. We endorse extreme oncoplasty plus WBRT as the default procedure of choice for patients with large multifocal/multicentric lesions amenable to reconstruction with local tissue rearranging mammaplasty.

Figure 1: Local recurrence: Extreme oncoplasty with WBRT vs mastectomy no RT



1683252 - MRD Assay evaluates Recurrence and response via a tumor Informed Assessment: MARIA-Breast Observational Trial

Kelli Swan[1], Edward Esplin[2], Lee Ifhar[2], Sarah Nielsen[2], Daniel Pineda-Alvarez[3], William O'Callaghan[4], Robert Daber[4], Darrel Ross[5], Carlos Vieira[6], Aadel Chaudhuri[7], W. Michael Korn[2]

[1]Invitae, Castle Pines, CO, [2]Invitae Corp, San Francisco, CA, [3]Invitae Corp, Wellington, FL, [4]Invitae Corp, Iselin, NJ, [5]Onslow Radiation Oncology, Jacksonville, NC, [6]Columbus Regional Health, Columbus, IN, [7]Washington University, St. Louis, MO

Background/Objective: Detectable ctDNA in patients with solid tumors has been associated with disease prognosis pre-treatment, assessing response to therapy in the form of minimal residual disease (MRD), and monitoring for recurrence after curative intent treatment. Utilizing patient-specific genomic mutation profiling of an individual's cancer from a tissue sample, in conjunction with the patient's germline DNA, to create a personalized sequencing panel to analyze for a subset of these genetic mutations from ctDNA in blood is a strategy that has high sensitivity for detecting MRD. Studies have shown that pretreatment levels of ctDNA using this approach are a potential early indicator of disease recurrence after surgery, that ctDNA clearance may be an early predictor of favorable outcomes and has been shown to correlate with pathologic complete response (Forde et al. N Engl J Med. 2022), and that this approach has high sensitivity for detecting recurrence for patients in advance of the current standard of care (Abbosh et al. Cancer Res (2020)

Methods: This is a multi-site, prospective, observational trial in the United States of patients with early stage breast cancer using a patient-specific tumor-informed MRD assay. Participants are asked to provide study specimens prior to initial treatment intervention, after curative intent surgical resection, during adjuvant therapy (as applicable) and pre-recurrence follow-up. ctDNA will be analyzed with an NGS-based, tumor-informed MRD assay that identifies somatic mutations from DNA obtained from the patient's tumor tissue, subtracts germline variants and detects a selected set of 18-50 tumor-specific variants in their blood. All primary tumor specimens will undergo full exome sequencing using the Personalized Cancer Monitoring (PCM) assay.

Results: Breast Cancer, stages IIb-III, all subtypes including hormone receptor positive, HER2 amplified, and triple negative. Definitive therapy is planned Availability of tumor tissue Over the age of 18 Willingness and ability to give informed consent

Conclusions: Primary endpoint of this study is to evaluate the correlation between PCM test results at the landmark time point and the patient's 24 month recurrence risk. Secondary endpoints include evaluating the impact on patient outcomes attributable to MRD result-based changes to treatment and other forms of clinical management, correlating between PCM result at baseline time point and patient recurrence risk and outcomes and investigating the lead time of PCM positivity over clinical/imaging based evidence of recurrence

1689439 - Improving the Quality of Cancer Care – The Longitudinal Effect of Surgeon-performed Breast Biopsy and Cancer Operation on Patient Care

Ankita Roy[1], Brian Weinstein[2], Lauren Allen[2]

[1]HCA East Florida Consortium (Westside/Northwest), Plantation, FL, [2]HCA Florida Westside, Plantation, FL

Background/Objective: Breast cancer treatment involves a multidisciplinary team of surgeons, medical oncologists, radiologists, nurses, and more. The majority of patients outside of metropolitan regions have their cancer care in the community setting, which may affect the coordination of care. The current standard of practice in many larger academic

centers is for patients to undergo radiologist-guided biopsies, who are then referred to surgeons. Few centers or community-based practices have surgeons that perform both stereotactic and ultrasound guided vacuum-assisted core needle biopsies such as ours. Our goal is to study the effect of having the same physician perform both diagnostic and therapeutic procedures for patients. The results of this study could have implications on the importance of community breast surgeons having the ability to perform core needle biopsies, especially with the future of breast cancer treatment moving towards minimally invasive surgery or non-operative management.

Methods: Patients who are scheduled to undergo stereotactic or vacuum-assisted core needle biopsy and breast cancer surgery with the same surgeon at our facility are being enrolled in the study. Variables on which data is collected: age, sex, race, breast cancer pathology, the time (in days) between diagnosis (date of abnormal mammogram finding) and definitive surgical treatment, size of lesion, and the rate of successful excision of lesion for small tumors.

Results: Patients with abnormal mammograms who have presented to our facility for core needle biopsy (stereotactic or vacuum-assisted) to be performed by the breast surgeon will be included in the data set. Patients who underwent neoadjuvant treatment, had prior treatment for breast cancer at outside facilities, who have presented with metastatic disease, will be excluded from the data set.

Conclusions: The primary outcome is to measure whether having the same physician perform both diagnostic and therapeutic procedures for patients decreases the time to treatment. The secondary outcome is to measure successful excision of lesion as determined by the post-biopsy report. Overall, this study aims to make a case for community-based breast surgeons to learn how to perform core-needle biopsies to improve the quality of breast cancer care being delivered to patients in resource-limited regions.

1688665 - VENUS trial: Sentinel lymph node biopsy VErsus No axillary surgery in early breast cancer clinically and UltraSonographically node negative: A Prospective Randomized Controlled Trial (NCT05315154/ RBR-8g6jbf)

Cassio Filho[1], Giuliano Duarte[2], Danielle Araújo[2], Maria Beatriz de Paula Leite Kraft Enz Hubert[2], Rodrigo Menezes Jales[2], Renato Torresan[2], Julia Shinzato[2], Fabrício Brenelli[2], Sergio Esteves[2], Higor Mantovani[2], Graziella Moraes[2], Luís Sarian[2], Eduardo Pessoa[3], Idam Oliveira[4], Rosemar Rahal[5], Ruffo Freitas[5], Leonardo Soares[6], Andrea Damin[7], Jorge Biazus[8], Lucas Budel[9], Vinicius Budel[9], Marcelo Antonini[10], Rafael Machado[11], Roberta Jales[12], Francisco Cavalcante[13], Darley Ferreira[14]

[1]University of Campinas, Campinas, Sao Paulo, Brazil, [2]UNICAMP, Campinas, Sao Paulo, Brazil, [3]Unesp, Botucatu, Sao Paulo, Brazil, [4]Hospital Câncer - Barretos, Barretos, Sao Paulo, Brazil, [5]UFG, Goiania, Goias, Brazil, [6]Hospital Maternidade Dona Iris, Goiania, Goias, Brazil, [7]Universidade Federal do Rio Grande do Sul, PORTO ALEGRE, Rio Grande do Sul, Brazil, [8]HCPA, Porto Alegre, Rio Grande do Sul, Brazil, [9]UFPR, Curitiba, Parana, Brazil, [10]Sociedade Brasileira de Mastologia, Sao Paulo, Brazil, [11]Hospital Federal da Lagoa, Rio de Janeiro, Brazil, [12]Liga Contra o Câncer de Natal, Natal, Rio Grande do Norte, Brazil, [13]Hospital Geral de Fortaleza, Fortaleza, Ceara, Brazil, [14]Hospital Barão de Lucena, Recife, Pernambuco, Brazil

Background/Objective: In early breast cancer, sentinel lymph node biopsy (SLNB) has become the gold standard of axillary evaluation. Although it has less morbidity than axillary lymph node dissection, it may still cause sequelae. The aim of this study is to compare the SLNB with no axillary surgery as an approach to the axilla in early breast cancer and negative axilla clinical and ultrasonographical. Our trial includes some subsets excluded in others similar ongoing trials: patients that will undergo mastectomy and will receive neoadjuvant therapy.

Methods: A multicenter, phase III, prospective, open-label, non-inferiority randomized clinical trial, including 17 study sites in Brazil that will randomize 800 early breast cancer patients.

Results: Inclusion: woman, age ≥ 18 years, histologic diagnostic of breast carcinoma, tumor ≤ 5 cm (T1 and T2) in all exams, clinically node-negative, ultrasound node-negative or negative core biopsy/ fine needle aspiration if suspect lymph node (in this situation is mandatory lymph node tissue in pathologic exam). Exclusion: metastatic disease in biopsy or image before treatment, pregnancy, breastfeed, previous diagnostic of invasive neoplasia (excluding skin cancer no melanoma). It will be allowed mastectomy and neoadjuvant treatment whether the patient has negative axilla and T1-2 pre-systemic therapy. Participants in the experimental group will not undergo axillary surgery and in the control group will be submitted at SLNB. The randomization will be 1:1 ratio and stratified by: tumor size (T1 and T2) and age (≥50 and < 50 years).

Conclusions: Primary objective is to assess whether omission of axillary surgery is not inferior to SLNB in terms of disease-free survival (DFS) at 5 years (primary endpoint). Secondary endpoints are overall survival, locoregional free survival, axillary recurrence rate, to describe surgical early and later complications and to evaluate costs of procedure SLNB or no.

1688287 - SMALL: Open Surgery versus Minimally invasive vacuum-Assisted excision for smaLL screen-detected breast cancer – A UK Phase III Randomised Multi-center Trial

Stuart McIntosh[1], Charlotte Coles[2], David Dodwell[3], Kenneth Elder[4], Jessica Foster[5], Claire Gaunt[5], Amanda Kirkham[5], Iain Lyburn[6], Jenna Morgan[7], Sangeetha Paramasivan[8], Sarah Pinder[9], Shelley Potter[10], Tracy Roberts[5], Nisha Sharma[11], Hilary Stobart[12], Elizabeth Southgate[5], Sian Taylor-Phillips[13], Matthew Wallis[14], Daniel Rea[5]

[1]Patrick G Johnston Centre for Cancer Research, Queen's University, Belfast, Northern Ireland, United Kingdom, [2]University of Cambridge, Cambridge, England, United Kingdom, [3]University of Oxford, Oxford, England, United Kingdom, [4]NHS Lothian, Edinburgh, Scotland, United Kingdom, [5]University of Birmingham, Birmingham, England, United Kingdom, [6]NHS Gloucestershire Hospitals, Cheltenham, England, United Kingdom, [7]Breast Oncology, Sheffield, England, United Kingdom, [8]University of Bristol, Bristol, England, United Kingdom, [9]King's College London, London, England, United Kingdom, [10]Bristol Medical School, Bristol, England, United Kingdom, [11]Leeds Teaching Hospitals NHS Trust, Leeds, England, United Kingdom, [12]Independent Cancer Patients' Voice, England, England, United Kingdom, [13]University of Warwick, Warwick, England, United Kingdom, [14]Cambridge University Hospitals, Cambridge, England, United Kingdom

Background/Objective: Mammographic screening programmes reduce breast cancer mortality but detect many small good-prognosis tumours which may not progress. These are treated with surgery and adjuvant therapies, but associated morbidities mean there is a need to reduce overtreatment. Minimally invasive treatment approaches have been described, although there is no prospective randomised evidence to support their use. SMALL (ISRCTN 12240119) is designed to determine the feasibility of using vacuum-assisted excision (VAE) to treat small tumours detected within the UK NHS Breast Screening Programme.

Methods: Phase III multicentre randomised trial comparing surgery to VAE for screen-detected cancers Patients are randomised 2:1 to VAE or surgery, with no axillary surgery in the VAE arm. Excision is assessed radiologically, and if incomplete, patients undergo surgery. Adjuvant radiotherapy and endocrine therapy are mandated following VAE. A QuinteT Recruitment Intervention (QRI) is integrated throughout SMALL to optimise recruitment. Recruitment challenges are identified by analysing recruiter/patient interviews and audio-recordings of trial discussions, and by review of screening, eligibility and recruitment data and study documentation. Solutions are developed collaboratively, including recruiter feedback and recruitment tips documents.

Results: Principal inclusion: age ≥47 years, unifocal grade 1 tumours with max diameter 15mm, strongly ER/PR+ve and HER2-ve, with negative axillary staging. Main exclusion criteria: lesions with associated microcalcification outwith the lesion, bilateral disease, invasive lobular cancer, grade 2/3 disease, high-risk group for developing breast cancer.

Conclusions: Co-primary end-points are: 1. Non-inferiority comparison of the requirement for a second procedure following excision 2. Single arm analysis of local recurrence (LR) at 5 years following VAE Secondary outcome measures include time to ipsilateral recurrence, overall survival, complications, quality of life and health economic analysis

1665904 - CINDERELLA Clinical Trial (NCT05196269): Using Artificial Intelligence-driven Healthcare to Enhance Breast Cancer Locoregional Treatment Decisions

Eduard-Alexandru Bonci[1], Orit Kaidar-Person[2], Marília Antunes[3], Oriana Ciani[4], Helena Cruz[1], Rosa Di Micco[5], Oreste D. Gentilini[5], Jörg Heil[6], Pawel Kabata[7], Miguel Romariz[8], Tiago Gonçalves[9], Henrique Martins[10], Ludovica Borsoi[4], Martin Mika[11], André Pfob[6], Natalie Romem[12], Timo Schinköthe[13], Giovani Silva[14], Maciej Bobowicz[15], Maria-Joao Cardoso[16]

[1]Champalimaud Research and Clinical Centre, Champalimaud Foundation, Lisbon, Lisboa, Portugal, [2]Sheba Medical Center (Ramat Gan, Israel); School of Medicine, Tel-Aviv University (Tel-Aviv, Israel), Tel-Aviv, Israel, [3]Universidade de Lisboa (Lisbon, Portugal); CEAUL - Centro de Estatística e Aplicações, Faculdade de Ciências, Universidade de Lisboa

(Lisbon, Portugal), Lisbon, Lisboa, Portugal, [4]Center for Research on Health and Social Care Management (CERGAS), SDA Bocconi University (Milan, Italy), Milan, Lombardia, Italy, [5]San Raffaele University and Research Hospital, Milan, Lombardia, Italy, [6]Heidelberg University Hospital, Heidelberg, Baden-Wurttemberg, Germany, [7]Copernicus Mamma Centrum, Wojewodzkie Centrum Onkologii, Copernicus Podmiot Leczniczy, Gdańsk, Pomorskie, Poland, [8]INESC TEC - Institute for Systems and Computer Engineering, Technology and Science (Porto, Portugal); FCUP - University of Porto (Porto, Portugal), Matosinhos, Porto, Portugal, [9]INESC TEC - Institute for Systems and Computer Engineering, Technology and Science (Porto, Portugal); FEUP - University of Porto (Porto, Portugal), Porto, Portugal, [10]Champalimaud Research and Clinical Centre, Champalimaud Foundation (Lisbon, Portugal); ISCTE - Instituto Universitário de Lisboa (Lisbon, Portugal), Lisbon, Lisboa, Portugal, [11]CANKADO GmbH, Ottobrunn, Bayern, Germany, [12]Sheba Medical Center, Ramat Gan, Tel Aviv, Israel, [13]CANKADO GmbH (Ottobrunn, Germany); Research Center Smart Digital Health, University of the Bundeswehr Munich (Neubiberg, Germany), Ottobrunn, Bayern, Germany, [14]CEAUL - Centro de Estatística e Aplicações, Universidade de Lisboa (Lisbon, Portugal); Instituto Superior Técnico, Universidade de Lisboa (Lisbon, Portugal), Lisbon, Lisboa, Portugal, [15]Institute of Maritime and Tropical Medicine Medical University of Gdańsk, Gdańsk, Pomorskie, Poland, [16]Champalimaud Research and Clinical Centre, Champalimaud Foundation (Lisbon, Portugal); University of Lisbon, Lisbon, Lisboa, Portugal

Background/Objective: Breast cancer treatment has improved overall survival rates, with different locoregional approaches offering patients similar locoregional control but variable aesthetic outcomes that may lead to disappointment and poor quality of life (QoL). There are no standardised methods for informing patients of the different therapies prior to intervention, nor validated tools for evaluation of aesthetics and patients' expectations. The CINDERELLA Project is based on years of research and developments of new healthcare technologies by various partners, aimed to provide an artificial intelligence (AI) tool to aid shared decision-making by showing breast cancer patients the predicted aesthetic outcomes of their locoregional treatment. The clinical trial will evaluate the use of this tool within an AI cloud-based platform approach (CINDERELLA APP) versus a standard approach.

Methods: CINDERELLA Clinical Trial is an international multicentric interventional randomised controlled open-label clinical trial. Randomisation will be performed centrally, 1:1, to the Control arm or AI and Digital Health (intervention) arm. Using the CINDERELLA APP, the AI and Digital Health arm will provide patients with complete information about the proposed types of locoregional treatments and photographs of similar patients previously treated with the same techniques. The Control arm will follow the standard approach of each clinical site. CANKADO is the underlying platform through which physicians control the patients' app content and conduct all data collection. Privacy, data protection and ethical principles in AI usage were considered.

Results: Patients diagnosed with primary breast cancer without evidence of systemic disease proposed for breast conserving surgery or mastectomy with immediate breast reconstruction.

Conclusions: Primary objectives: to assess the levels of agreement among patients' expectations regarding the aesthetic outcome before and 12 months after locoregional treatment. The trial will also evaluate the aesthetic outcome level of agreement between the AI evaluation tool and self-evaluation. Secondary objectives: health-related QoL (EQ-5D-5L and BREAST-Q ICHOM questionnaires) and resource consumption (e.g., time spent in the hospital, out-of-pocket expenses). The questionnaires and photographs will be applied prior to any treatment, at wound healing, at 6 and 12 months following the completion of locoregional therapy.

1612792 - Ultrasound Follow-up for Stable Fibroadenoma After Nine Months in Young Age Women No More Evaluation Required

Rewan Hasan

FACS, Erbil, Arbil, Iraq

Background/Objective: To evaluate the stable fibroadenoma within (9 months) follow-up in patients with breast medical report, after a diagnosis of an image-guided Ultrasonography, to release stress on young age women and discharge.

Methods: A prospective study of 51 cases attended to breast diagnostic center and breast clinic with breast mass (single or multiple) from January 2018 to June 2022. Patients age between 15 to 35 years old women included in this study.

Results: 1.Inclusion criteria were: Occurrence of a short-term, 9-month follow-up with US, performed at our institution. Ages between 16-25 years, mass size 24mm and less, married or unmarried, unilateral or bilateral breast masses, single or multiple masses. 2.Exclusion criteria were: pregnancy; breast feeding; malignant breast cancer, age below 16 and above 25 years old, Change in number of mass and size, All other breast masses with typical criteria for being simple cysts, lipomas, recurrent lesions and Family history of breast cancer.

Conclusions: • Summarize the use of a breast ultrasound in the evaluation of breast fibroadenoma. • Explain the importance of improving care coordination among the interprofessional team to improve outcomes for patients with breast fibroadenomas.

Table 1: Demographic sample population of breast cancer

Variables		No.	%
Age Group (years)	16-25	21	41.2
	26-35	30	58.8
Marital Status	Single	34	66.7
	Married	17	33.3
Complain	Pain	16	31.4
	Lump	34	66.7
	Lump & Pain	1	2.0
Site	Right	24	47.1
	Left	16	31.4
	Both Sides	11	21.6
Single or Multiple	Single	38	74.5
	Multiple	13	25.5
Histopathology	FNA	21	41.2
	Not done	30	58.8

1682528 - MELODY: A Prospective Non-interventional Multicenter Cohort Study to Evaluate Different Imaging-guided Methods for Localization of Malignant Breast Lesions (EUBREAST-4 / iBRA-NET, NCT 0555941 1)

Neslihan Cabioglu[1], Thorsten Kühn[2], Yazan Masannat[3], Antonio A. Esgueva[4], Guldeniz Karadeniz Cakmak[5], Bahadir Gulluoglu[6], Nina Ditsch[7], Nuh Zafer Canturk[8], Maria Luisa Gasparri[9], Dawid Murawa[10], Michalis Kontos[11], Isabel T Rubio[12], Natalia Krawczyk[13], Steffi Hartmann[14], Jana De Boniface[15], Tove Tvedskov[16], Lina Pankratjevaite[17], Mah

Muneer Khan[18], Lia Rebaza[19], Andreas Karakatnis[20], Rajiv Dave[21], Shelley Potter[22], Ashutosh Kothari[23], Oreste D. Gentilini[24], Walter P. Weber[25], Markus Hahn[26], Michael Lux[27], Marjolein Smidt[28], Bilge Aktas Sezen[29], Rosa Di Micco[24], Maria Antónia Vasconcelos[30], Aoife Lowery[31], Sarah Nietz[32], Francois Malherbe[33], Severine Alran[34], Svs Deo[35], Jai Min Ryu[36], Veronica Fabiano[37], Florentia Peintinger[38], James Harvey[21], Maggie Banys-Paluchowski[39]

[1]University of Istanbul, Istanbul, Turkey, [2]Die Filderklinik, Filderstadt, Baden-Wurttemberg, Germany, [3]Broomfield Hospital, Mid and South Essex NHS Trust, England, UK, Chemlsford, England, United Kingdom, [4]Clinica Universidad de Navarra, Madrid, Spain, [5]Zonguldak Bulent Ecevit University, School of Medicine, Zonguldak, Turkey, [6]Marmara University School of Medicine and SENATURK Turkish Academy of Senology, Istanbul, Turkey, [7]Klinik für Frauenheilkunde und Geburtshilfe, Universitätsklinikum Augsburg, Augsburg, Brandenburg, Germany, [8]Kocaeli University School of Medicine, Kocaeli, Turkey, [9]University of the Italian Switzerland (USI), Centro di Senologia della Svizzera Italiana (CSSI) Ospedale Regionale di Lugano EOC, Lugano, Ticino, Switzerland, [10]Collegium Medicum, University of Zielona Góra, Poland, Zielona Góra, Swietokrzyskie, Poland, [11]Laiko Hospital, National and Kapodistrian University of Athens, Athens, Attiki, Greece, [12]Clínica Universidad de Navarra Madrid, Navara, Madrid, Spain, [13]Heinrich-Heine-University Düsseldorf, Dusseldorf, Nordrhein-Westfalen, Germany, [14]University Hospital Rostock, Rostock, Mecklenburg-Vorpommern, Germany, [15]Karolinska Institutet, Stockholm, Sweden, and Capio St. Göran's Hospital, Stockholms Lan, Sweden, [16]Herlev-Gentofte Hospital, Gentofte, Hovedstaden, Denmark, [17]University of Copenhagen, Herlev & Gentofte University Hospital, Copenhagen, Hovedstaden, Denmark, [18]Khyber Medical College & Khyber Teaching Hospital, Peshawar, North-West Frontier, Pakistan, [19]Clinica Oncosalud Auna, Lima, Peru, [20]Uppsala University, Sweden, and Section for Breast Surgery, Department of Surgery, Uppsala University Hospital, Uppsala Lan, Sweden, [21]The Nightingale and PREVENT Breast Cancer Centre, Manchester University NHS Foundation Trust & University of Manchester, Manchester, England, United Kingdom, [22]Bristol Medical School, Bristol, England, United Kingdom, [23]Guy's & St Thomas NHS Trust, London, England, United Kingdom, [24]San Raffaele University and Research Hospital, Milan, Lombardia, Italy, [25]University of Basel, Basel, Switzerland; University Hospital Basel, Basel, Basel-Stadt, Switzerland, [26]University of Tübingen, Tübingen, Baden-Wurttemberg, Germany, [27]Frauenklinik St. Louise Paderborn, Frauenklinik St. Josefs Salzkotten, St. Vincenz Kliniken Salzkotten + Paderborn, Paderborn, Nordrhein-Westfalen, Germany, [28]Maastricht University Medical Center, Maastricht, Limburg, Netherlands, [29]European Breast Cancer Research Association of Surgical Trialists (EUBREAST), Kirchheim unter Teck, Baden-Wurttemberg, Germany, [30]Champalimaud Clinical Centre, Champalimaud Foundation, Lisbon, Lisboa, Portugal, [31]University of Galway, Galway, Northern Ireland, United Kingdom, [32]University of the Witwatersrand, Johannesburg, Gauteng, South Africa, [33]University of Cape Town, Western Cape, South Africa, [34]Groupe Hospitalier Paris Saint Joseph Paris, Ile-de-France, France, [35]All India Institute of Medical Sciences, Delhi, India, [36]Sungkyunkwan University School of Medicine Samsung Medical Center, Seoul-t'ukpyolsi, Republic of Korea, [37]Instituto Alexander Fleming Argentina, Buenos Aires, Argentina, [38]Universitätsklinik für Frauenheilkunde und Geburtshilfe, Graz & Institut für Pathologie, Med. Univ Graz, Graz, Steiermark, Austria, [39]University Hospital Schleswig-Holstein Campus, Lübeck, Schleswig-Holstein, Germany

Background/Objective: Background: In the last decades, the proportion of breast cancer patients receiving breast-conserving surgery has increased, reaching 70-80% in developed countries. In case of non-palpable lesions, surgical excision requires some form of breast localization. While wire-guided localization has long been considered gold standard, it carries several limitations, including logistical difficulties, the potential for displacement and patient discomfort, and re-excision rates reaching 21%. Other techniques (radioactive seed or radio-occult lesion localization, intraoperative ultrasound, magnetic, radiofrequency and radar localization) have been developed with the aim of overcoming these disadvantages. However, comparative data on the rates of successful lesion removal, negative margins and re-operations are limited. In the majority of studies, the patient's perspective with regard to discomfort and pain level has not been evaluated. The aim of MELODY (MEthods for LOcalization of Different types of breast lesions) is to

evaluate different imaging-guided localization methods with regard to oncological safety, patient-reported outcomes, and surgeon and radiologist satisfaction.

Methods: The EUBREAST and the iBRA-NET have initiated the MELODY study to assess breast localization techniques and devices from several perspectives (NCT05559411, http://eubreast.org/melody).

Results: - Female / male patients ≥ 18 years old - Malignant breast lesion requiring breast-conserving surgery and imaging-guided localization (either DCIS or invasive breast cancer; multiple or bilateral lesions and the use of neoadjuvant chemotherapy are allowed) - Planned surgical removal of the lesion using one or more of the following imagingguided localization techniques: o Wire-guided localization o Intraoperative ultrasound o Magnetic localization o Radioactive seed localization o Radioguided Occult Lesion Localization (ROLL) o Radar localization o Radiofrequency identification (RFID) tag localization o Ink/carbon localization

Conclusions: Primary outcomes are: 1) Intended target lesion and/or marker removal, independent of margin status on final histopathology, and 2) Negative resection margin rates at first surgery. Secondary outcomes are among others : rates of second surgery and secondary mastectomy, resection ratio (defined as actual resection volume divided by the calculated optimum specimen volume), duration of surgery, marker dislocation rates, rates of marker placement or localization failure, comparison of patient-reported outcomes, rates of “lost markers” and diagnostician/radiologist's and surgeon's satisfaction as well as the health economic evaluation of the different techniques.

1686548 - Breast Cancer Screening Patterns in the Geriatric Population

Theresa Relation[1], Christin Collins[2], Benjamin Li[2], Christina Clemow[2], Natalie Joseph[2]

[1]MetroHealth Systems Case Western Reserve University, Lakewood, OH, [2]MetroHealth Systems Case Western Reserve University, Cleveland, OH

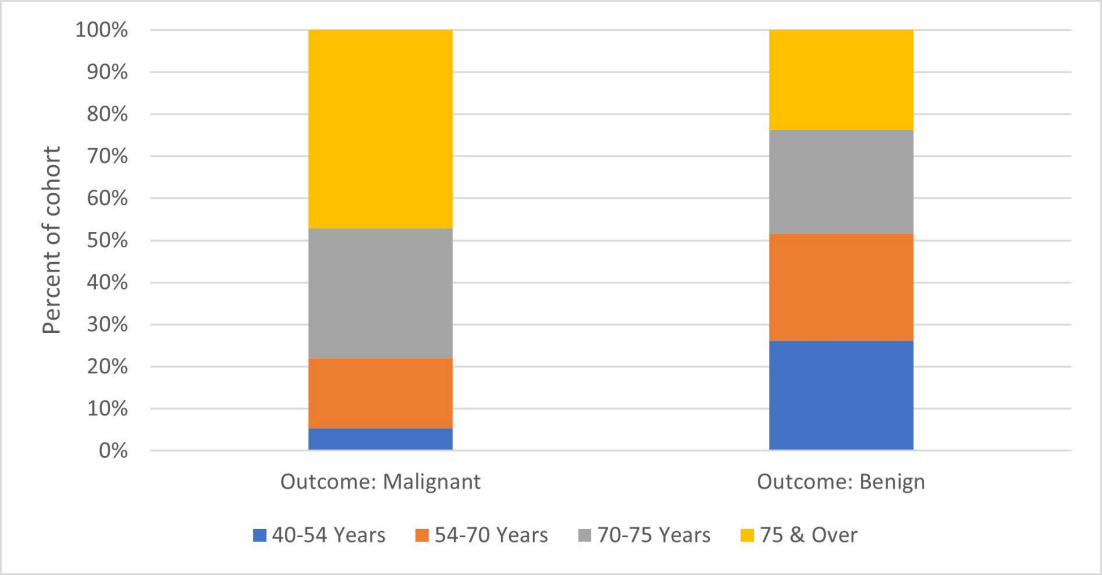
Background/Objective: Although consideration is given to continue breast cancer screening over the age of 74 if patients have a life expectancy of at least 10 years, most guidelines do not include women over 74 in their recommendations due to the lack of evidence in this age group and very few screening trials including women over 70. The purpose of this study was to evaluate our institutional experience with breast cancer screening in women over the age of 70.

Methods: We used data from electronic health records, tumor registry and Magview radiology reporting system to identify women screened for breast cancer within an urban community safety net healthcare system from 2021-2023. We used multivariate regression analysis to establish associations between age, race, insurance status, comorbidities, additional diagnostic testing, cancer diagnosis, and stage at diagnosis.

Results: 8890 (19.6%) of 43412 total patients were over age 70 at time of screening. Of those, 1227 had abnormal screening that warranted further diagnostic testing (BIRADS 0, 4, or 5). 42.7% of all breast cancers diagnosed within the screened population were in patients over 70. The majority of this cohort was insured through Medicare and were less likely to self-pay for screening. There was no significant difference in race among cohorts. Patients over 70 were more likely to be diagnosed with hypertension, diabetes, heart failure, and/or obesity (47.2% vs 7.4%, $p< 0.0001$). Patients over 70 who underwent screening were more likely to be diagnosed with malignancy compared to their patients < 70 (8.8% vs 2.9%, $p< 0.0001$). 66.1% of patients < 70 were diagnosed as stage 0 or 1 compared to 78.8% in patients over 70, however this difference failed to reach significance ($p=0.08$). Patients over age 70 were more than twice as likely to elected for hormone therapy or palliative only compared to patients < 70.

Conclusions: Within our institution, screening mammography in patients over the age of 70 is associated with higher likelihood of subsequent breast cancer diagnosis compared to the overall screening population. Patients over 70 diagnosed with breast cancer were more likely to to have multiple comorbidities and were most commonly diagnosed with early stage, suggesting possible over-diagnosis within this population. Our findings suggest that a patient-centered approach to breast cancer screening is necessary to reduce the potential for harm among the geriatric population.

Figure 1: Breast cancer screening outcomes, 2021-2023



1688462 - Utility of Axillary Staging in Older Patients with HER2+ Breast Cancer Who Receive Neoadjuvant Therapy

Juliet Dalton[1], Kerri-Anne Crowell[2], Koumani Ntowe[1], Astrid Botty van den Bruele[1], Samantha Thomas[2], Ton Wang[3], Laura Rosenberger[1], Jennifer Plichta[1]

[1]Duke University Medical Center, Durham, NC, [2]Duke Cancer Institute, Durham, NC, [3]Duke University Medical Center, Raleigh, NC

Background/Objective: The utility of information provided by a sentinel lymph node biopsy (SLNB) has been challenged, especially in breast cancer that is highly responsive to systemic treatment, such as HER2+ disease. Patients that are cN0 following neoadjuvant therapy (NAT) and achieve a pathologic complete response (pCR) have low rates of nodal positivity, which could be a reason to avoid axillary surgery. We evaluated the differences in pathologic response, adjuvant treatment decisions, and overall survival (OS) based on a patient's nodal status in a cohort of older women. Our aim was to investigate the variables that may be considered when determining the necessity of axillary staging.

Methods: Patients aged >70y diagnosed from 2010-2020 with cT1-2/cN0/M0, HER2+ breast cancer who received NAT followed by breast surgery (lumpectomy or mastectomy, +/- axillary staging) were selected from the National Cancer Database. Logistic regression was used to identify factors associated with (1) SLNB receipt, (2) SLNB outcome (ypN0/ypN+), and (3) radiation therapy; odds ratios (OR) and confidence intervals (CI) are reported. Cox Proportional Hazards models were used to estimate the factors associated with OS after adjustment for select covariates; hazard ratios (HRs) and 95% CIs are reported.

Results: We identified 1,117 patients for inclusion. The median age was 73y, and median follow up time was 61.4 months (95% CI 60.2 – 63.7). 97.6% of patients received neoadjuvant chemotherapy and 82.8% received anti-HER2 therapy. Of the entire cohort, 96.7% underwent SLNB and 6.8% were node positive, most of which were ypN1 (95.9%). The overall rate of pCR following NAT was 35.6%. Of those with pCR who underwent SLNB, 0.03% of patients (n=1) were found to be ypN+. Of the patients who were ypT1 and underwent SLNB, 8.8% were node positive (n=45), and of those who were ypT2, 15.0% were node positive (n=27) (Table). Compared to those aged 70-74y, patients >85y were less likely to undergo SLNB (OR 0.24, 95% CI 0.07-0.78). Rates of radiation therapy were higher for those with ypN+ vs ypN0 (OR 3.77, 95% CI 1.47-9.66). After adjustment, patients with both ypN+ and ypN0 had similar OS compared to those who did not have any nodes removed (no SLNB: ref; pN+: HR 1.77, 95% CI 0.68-4.62; pN0: HR 0.72, 95% CI 0.31-1.69). However, patients who were ypN+ had worse OS compared to those that were ypN0 (HR 2.4, 95% CI 1.43-4.09). Adjuvant radiation therapy was not associated with improved OS (HR 0.76, 95% CI 0.49-1.2).

Conclusions: Nodal positivity in patients who achieve a breast pCR following NAT is an exceedingly rare event, occurring in < 0.1% of patients, suggesting that axillary staging in patients who achieve a breast PCR is unnecessary. Additionally, although results of SLNB appear to influence adjuvant radiation decisions, radiation was not associated with improved OS in this cohort. These results call into question the necessity of routine axillary staging in older patients with cT1-2, cN0, HER2+ breast cancer who receive NAT.

Table 1: Extent of nodal disease in patients who underwent SLNB by pathologic response

	No. of patients	No. (%) of patients pN0	No. (%) of patients pN1	No. (%) of patients pN2	No. (%) of patients pN3
Breast pCR					
pT0/pTis	386	385 (99.7%)	1 (0.03%)	0 (0.00%)	0 (0.00%)
Residual Breast Disease					
pT1	514	469 (91.2%)	45 (8.80%)	0 (0.00%)	0 (0.00%)
pT2	180	153 (85.0%)	26 (14.4%)	1 (0.60%)	0 (0.00%)

1688067 - The Impact of Young Age on Chemotherapy Use in Breast Cancer Patients with Hormone Receptor-positive, HER2-negative (HR+HER2-) Breast Cancer

Elizabeth Hedges[1], Christopher Porter[2], Arkadii Sipok[1], Lolita Ramsey[2], Shawna Willey[3], Arielle Stafford[4]

[1]INOVA Fairfax Hospital, Falls Church, VA, [2]INOVA Fairfax Medical Campus, Falls Church, VA, [3]INOVA Fairfax Hospital, Fairfax, VA, [4]Inova Schar Cancer Institute, Fairfax, VA

Background/Objective: Young age (less than 40) is frequently cited as a high-risk factor in hormone receptor positive, HER2 negative breast cancer (HR+HER2-BC) and correlates with a high utilization of chemotherapy. While chemotherapy is indicated in many of these patients, consideration should be given to omitting chemotherapy in young patients without other high-risk factors. Young patients who undergo chemotherapy face an elevated risk of various issues, including infertility, psychological and sexual health problems, and secondary malignancy. The aim of this study was to evaluate the use of chemotherapy in young adults with HR+HER2-BC and determine characteristics associated with chemotherapy use.

Methods: This study was a secondary data analysis utilizing the American College of Surgeons' Commission on Cancer's (CoC's) National Cancer Database (NCDB) from 2012-2020. Female and male patients aged 18 or older, diagnosed and surgically treated for stage I, II, III HR+HER2-BC were included. Chemotherapy treatment was defined as neoadjuvant or adjuvant chemotherapy with or without hormonal therapy; whereas no chemotherapy includes those who had hormonal treatment alone or no systemic treatment. Histology codes for infiltrating ductal carcinoma, lobular carcinoma, mixed, or not specified were included (8500, 8520, 8521, 8522, 8523). Demographics, tumor characteristics, treatment, and mortality were analyzed. Descriptive statistics and Pearson's Chi-Square (two-sided, sig. $p \leq 0.05$) were conducted to compare patients who had chemotherapy vs. no chemotherapy and stratified to a cohort of young adults age ≤40 years.

Results: Of the 947,024 patients in the NCDB with HR+HER2-BC, 27.0% (255,949) had chemotherapy. Chemotherapy was given to 69.0% of patients age 18-40 and 25.1% of patients age 41 or older (27,946/40,490 versus 228,003/906,534; $p<.001$) and was administered significantly more commonly in those age 18 to 30 compared to ages 31 to 40 (80.5% versus 67.6%, $p< 0.001$). In patients age 18-40, a higher proportion of Black/African Americans had chemotherapy (74.1%) compared to Caucasians (68.3%, $p< 0.001$). Almost all patients with clinical stage III cancer received chemotherapy (98.3%) as well as those with clinical N3 disease (99.5%). Young adults who received chemotherapy had significantly larger tumors than those who did not (25 mm versus 15 mm, $p=0.002$). The majority (68.8%) of young patients did not have Oncotype DX scores (ODX) reported. In patients with reported scores, 91.8% of high, 62.2% of intermediate, and 14.2% of low ODX scores received chemotherapy. Non-private insurance and higher education and income by geographic location were also associated with increased chemotherapy use. The proportion of young adults treated with chemotherapy significantly declined from 73.5% in 2012 to 66% in 2020 ($p< 0.001$).

Conclusions: The rate of chemotherapy use for HR+HER2-BC is higher in patients age 18-40 compared to patients older than 40, with patients age 18-30 receiving chemotherapy at the highest rate. In our cohort of young adults, chemotherapy use was associated with larger tumors, higher clinical stage, and higher ODX score. We suspect that increased use of ODX scores may have contributed to the decrease in chemotherapy utilization in this population. Further studies are needed to determine which subgroups within this patient population can safely omit chemotherapy.

Table 1. Clinical and tumor characteristics of adults (18-40 years) by chemotherapy

Characteristic	No Chemotherapy N (%) N=12,544 (31%)	Chemotherapy N (%) N=27,946 (69%)	p-value
Primary Tumor Site			<0.001
Nipple	32 (28.8)	79 (71.2)	
Central portion of breast	508 (30.2)	1174 (69.8)	
Upper-inner quadrant of breast	1723 (35.9)	3082 (64.1)	
Lower-inner quadrant of breast	671 (33.3)	1342 (66.7)	
Upper-outer quadrant of breast	4258 (31.5)	9257 (68.5)	
Lower-outer quadrant of breast	1194 (33.0)	2424 (67.0)	
Axillary Tail of breast	81 (44.3)	102 (55.7)	
Overlapping lesion of breast	2876 (30.5)	6566 (69.5)	
Breast, NOS	1201 (23.5)	3920 (76.5)	
Clinical Stage			<0.001
I	10107 (51.7)	9445 (48.3)	
II	2362 (14.2)	14217 (85.8)	
III	75 (1.7)	4284 (98.3)	
cN-Stage			<0.001
0	11927 (41.8)	16586 (58.2)	
1	505 (5.1)	9416 (94.9)	
2	34 (3.3)	1011 (96.7)	
3	4 (0.5)	766 (99.5)	
Median Tumor Size (IQR)	15 (12)	25 (22)	0.002
Procedure			<0.001
Partial mastectomy	5169 (41.7)	7218 (58.3)	
Total/Radical mastectomy	7375 (26.2)	20728 (73.8)	
pN-Stage			<0.001
0	10182 (51.0)	9771 (49.0)	
1	1863 (16.5)	9432 (83.5)	
2	134 (4.8)	2634 (95.2)	
3	47 (4.7)	960 (95.3)	
Adjuvant Radiation Tx			<0.001
No	7151 (43.6)	9263 (56.4)	
Yes	5393 (22.4)	18683 (77.6)	
Oncotype DX risk			<0.001
Low	5345 (85.8)	881 (14.2)	
Intermediate	1754 (37.8)	2881 (62.2)	
High	145 (8.2)	1625 (91.8)	
Not assessed	5300 (19.0)	22559 (81.0)	
30-day mortality			<0.001
No	10864 (30.5)	24734 (69.5)	
Yes	1 (16.7)	5 (83.3)	
Unknown	53 (50.0)	53 (50.0)	
90-day mortality			<0.001
No	10803 (30.5)	24659 (69.5)	
Yes	3 (12.0)	22 (88.0)	
Unknown	112 (50.2)	111 (49.8)	

Abbreviations: IQR: interquartile range;

1683872 - Epidemiological, Clinical, and Therapeutic Aspects of Idiopathic Granulomatous Mastitis Treated with Intralesional Steroid Injections

Larissa Bitencourt[1], Luíza Mascarenhas[2]

[1]Clínica AMO, Salvador, Bahia, Brazil, [2]Hospital Irma Dulce, Salvador, Bahia, Brazil

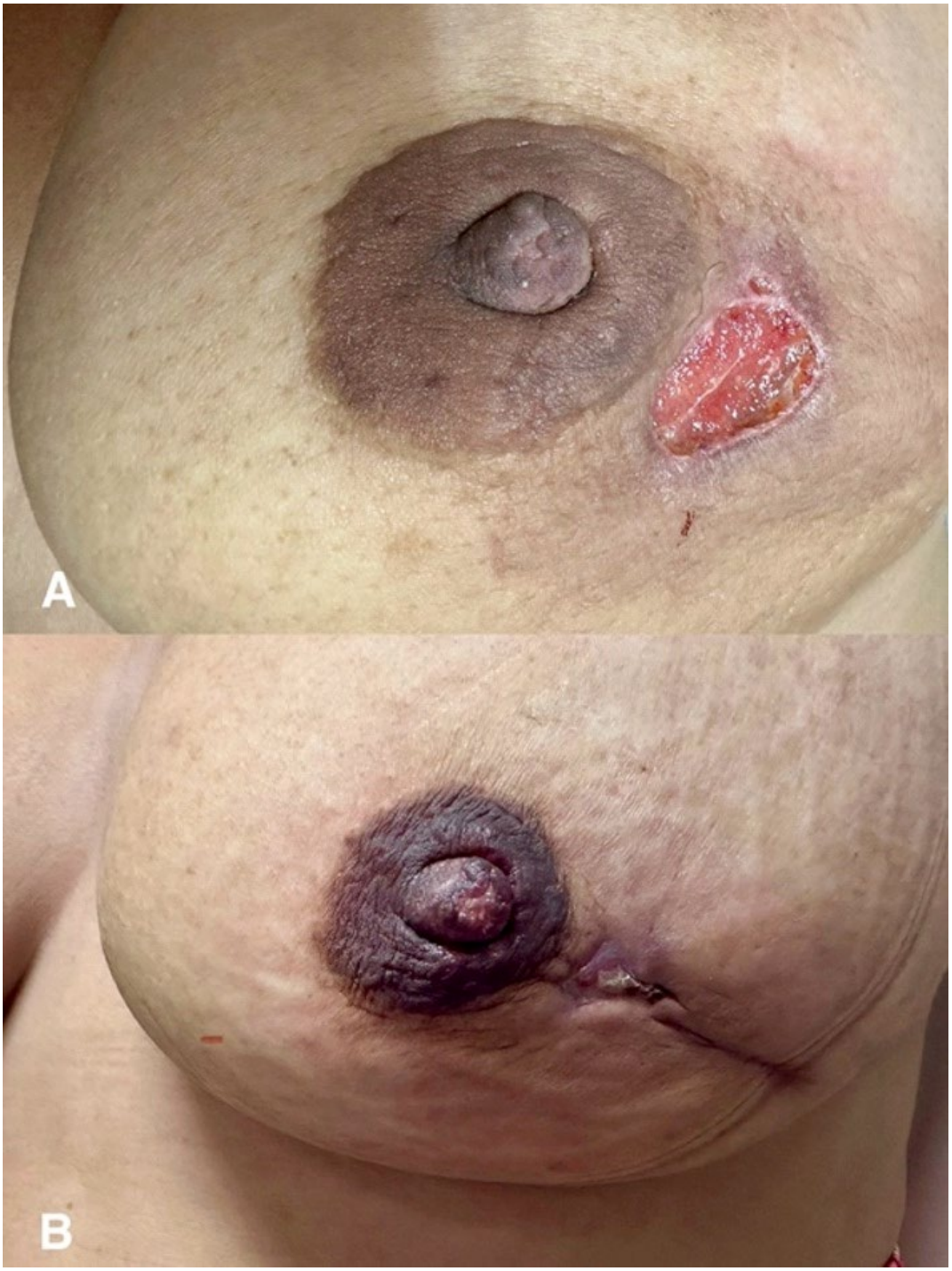
Background/Objective: To describe the clinical, epidemiological and therapeutic aspects of patients diagnosed with IGM and treated with intralesional corticosteroids.

Methods: This is a retrospective review of a breast cancer department in Salvador, Brazil. We reviewed medical records from May 2023 to January 2024. Were included patients with a confirmed histological diagnosis of granulomatous mastitis, negative cultures for bacteria/fungi, and who had been treated with ultrasound-guided intralesional corticosteroids (triamcinolone acetonide). The department's protocol is to apply up to 80mg of triamcinolone acetonide (20 mg/mL) intralesional every 3-4 weeks.

Results: A total of 10 patients with diagnosed biopsy-proven granulomatous mastitis were identified. The baseline characteristics and risk factors of these patients were summarized in Table 1.All patients were women (100%). The mean age of the patients at presentation was 35.8 years (range: 28–45), with all women at reproductive age. Most patients were overweight, with a mean body mass index (BMI) of 31,64. All patients were in premenopausal status (100%). Nine (90%) had their first live birth before 30 years old, and eight (80%) breastfed for more than 6 months. Only one patient (10%) had a family history of breast cancer (first-degree relative). None of them were smokers, 6 (60%) did not consume alcohol, did not exercise, and did not consider their diet healthy. Insomnia was observed in 6 patients (60%). The most common symptom reported at presentation was pain/tenderness plus hyperemia (90%). All patients had skin involvement, 3 (30%) had fistulas. Eight patients had abnormal palpation, 4 (50%) with dense areas and 4 (40%) with nodules. Patients did not have any abnormalities in the axilla or nipple discharge. The clinical characteristics were summarized in Table 2.Mammography was performed on five patients, and the most common mammographic Breast Imaging Reporting and Data System (BI-RADS) category was BI-RADS 2. Only one patient had a BI-RADS 4. Breast ultrasonography was performed on all patients, but only three patients (30%) had a BI-RADS 4. Only one patient underwent an MRI, which also showed a BI-RADS 4. These findings can be observed in Table 3.The mean number of intralesional steroid injections was 3.3±1.94 injections (range: 1–6), and the follow-up time was 5.7±2.31 months (range: 1–8). Only one patient had a side effect, a skin retraction (Figure 1). All patients received other therapies before the applications. Only two continued methotrexate during applications. Treatment findings are presented in Table 4. The clinical complete response was observed in 5 (50%) patients, 3 (30%) had a partial response and only 2 (20%) had no response (Graphic 1). The radiological complete response was observed in 4 (40%) patients, 4 (40%) had a partial response and only 2 (20%) had no response (Graphic 2). Figure 2 shows a complete radiological response.

Conclusions: None of the factors described were associated with a complete clinical response with statistically significant value. Steroid injection is a treatment with good efficacy, a short response time, low cost, easy administration, and minimal risk of systemic side effects.

Figure 1: A) Wound at presentation. B) 6 months later, with scar and skin retraction



1675823 - Factors Predicting Upgrade to Malignancy After Surgical Excision of Biopsy Proven Radial Scar or Complex Sclerosing Lesion

Ashley Wilbers[1], Kaitlyn Kennard[2], Ariana Naaseh[3], Omolade Sogade[1], Lisa Mogil[1], Yu Tao[1], Jingqin Luo[1], Julie Margenthaler[1], Jodie Chang[4]

[1]Washington University School of Medicine, St. Louis, MO, [2]Jefferson Health, Sewell, NJ, [3]Washington University in St. Louis, St. Louis, MO, [4]TRA Medical Imaging, Tacoma, WA

Background/Objective: The American Society of Breast Surgeons (ASBrS) recommends that most radial scar (RS)/complex sclerosing lesions (CSL) should be excised due to an up to 30% reported rate of upgrade to malignancy, but imaging surveillance is a proposed alternative in patients with small lesions who were well-sampled at the time of biopsy. This study aimed to identify risk factors associated with upgrade of RS/CSL to malignancy to better predict which patients should undergo surgical excision or imaging surveillance.

Methods: This is an institutional retrospective review of patients diagnosed with RS/CSL on core biopsy who underwent surgical excision from January 2020 to December 2021. Change to non-malignant pathology was defined as benign tissue, intraductal papilloma (IP), atypical lobular hyperplasia (ALH), or atypical ductal hyperplasia (ADH) on final surgical pathology. Upgrade to malignancy was defined as any invasive ductal carcinoma (IDC), ductal carcinoma in-situ (DCIS), invasive lobular carcinoma (ILC), or lobular carcinoma in-situ (LCIS) on final surgical pathology. A multivariable logistic regression model was performed to determine factors associated with upgrade/change of pathology.

Results: 64 patients were included in this study, 29 of which were CSL and 35 RS on core biopsy. 42 (65.6%) patients had no change in pathology. 14 patients (21.88%) had a change in pathology, 9 of which were benign tissue, 2 IP, 2 ADH, and 1 ALH. The overall rate of upgrade was 12.5% (8 patients), 7 of which were CSL (4 upgraded to DCIS, 2 to LCIS, and 1 to IDC) and only 1 RS (upgraded to LCIS). Multivariable logistic regression model showed that family history predicted change/upgrade (odds ratio [OR] 6.16; 95% confidence interval [CI] 1.34-28.23; P=0.031) and CSL on core biopsy may also be predictive with a borderline statistical significance (OR 4.51; 95% CI 0.97-21.08; P=0.059).

Conclusions: This study supports that the rate of upgrade of RS/CSL may be lower than original studies reported. Special consideration for surgical excision should be given for those with a strong family history or complex sclerosing lesion on core biopsy.

1688286 – Vacuum-assisted Excision of Intraductal Papillomas: A Practical Alternative to Both Core Needle Biopsy and Excisional Surgery

Parisa Aziminezhadan

Private sector, Tehran, Iran

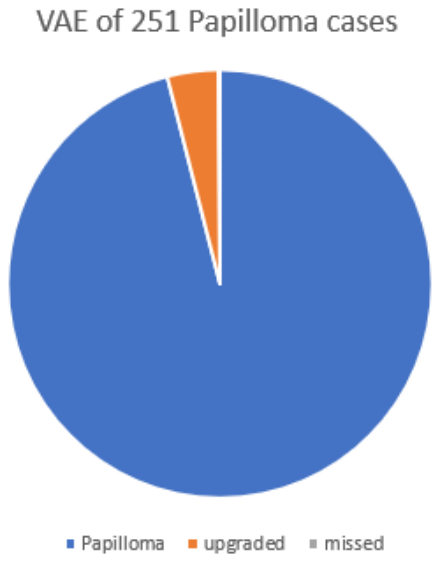
Background/Objective: Intraductal papillomas (IPs) of the breast are benign growths originating from the epithelium of the milk duct. Owing to their heterogeneity and the risk for upgrading to DCIS or coexistence of a malignant lesion, surgical excision may be necessary even after benign histology report from a core needle biopsy (CNB). VAE obtains larger amount of tissue with contiguous specimens, with the possibility of acquiring multiple specimens with single insertion of a needle, a more accurate diagnosis with a lower cancer miss rate, lower histological underestimates and complete excision of the lesion. Vacuum-assisted excision (VAE) of IPs can be used as a substitute for core needle biopsy and subsequent surgery .

Methods: Retrospectively, 449 patients with IP diagnosis in their EMR were reviewed. Only 342 patients with CNB or VAE with final diagnosis of IP were included. Upgrade rates and influencing factors were studied. Criteria for excision of IP was, size larger than 5 mm , symptoms like bloody discharge, high risk features like atypia DCIS or LCIS, peripheral location of IP (> 3 cm away from NAC), Suspicious imaging, radio pathologic discordance and patients request.

Results: VAE was performed in 251 patients with 96 % final diagnosis of papilloma and 3.9 % upgrade rate. In 89.6 %, the indication of VAE was size larger than 5 mm . Previous CNB was done in 31% of patients. Average age of patients having Papilloma was 44 years old and average excised mass size was 13.86 mm . Overall 6.4 % of patients was upgraded which was not found a meaningful relation to the lesion size , location and patients age.

Conclusions: Regarding high upgrade rate of IP, and the heterogeneity of these lesions, CNB can not rule out high risk tissue changes. VAE completely excise these lesion and provide adequate tissue sample. No further operation is needed after majority of cases and patients can return to routine screening programs.

Figure 1: Final pathologic result of 251 VAE of papilloma



1686163 - Distance of Biopsy-confirmed High-risk Breast Lesion from Concurrently Identified Breast Malignancy Is Associated with Risk of Carcinoma at the High-Risk Lesion Site

Julie Le[1], Thomas O'Keefe, V[2], Sohini Khan[1], Sara Grossi[1], Hye Young Choi[1], Haydee Ojeda-Fournier[1], Ava Armani[1], Anne Wallace[1], Sarah Blair[3]

[1]UC San Diego Health, San Diego, CA, [2]Jennifer Moreno VA Hospital, La Jolla, CA, [3]UCSD, San Diego, CA

Background/Objective: Routine excision of incidental intraductal papilloma without atypia (IPA), lobular hyperplasia (LCIS or ALH), flat epithelial atypia (FEA) and complex sclerosing lesion (CSL) is no longer recommended due to low upgrade rates to carcinoma. However, little evidence exists regarding the need for excision of these lesions when identified concurrently with malignancy. We aim to characterize the upgrade rate and clinical features associated with increased risk of upgrade on excision.

Methods: A single-center retrospective review was performed of patients who underwent multi-site lumpectomies involving invasive disease at one site and high-risk lesions (IPA, ALH, LCIS, FEA, or CSL) at another ipsilateral or contralateral site between 2006-2021. The primary outcome was demonstration of carcinoma at the excised high risk lesion site, persistence of the high-risk lesion, or absence of both. Univariate multinomial logistic regression was performed. Variables for which significant ($p< 0.05$) levels were identified were incorporated into a multivariate model.

Results: Sixty-five patients met inclusion criteria with 60 (92%) diagnosed with clinical stage 0 through 2 carcinoma. High-risk lesions were detected by MRI in 45 (69%) patients. The lesion was IPA in 38 (58%) patients, CSL in 17 (26%) patients, ALH in 5 (8%) patients, LCIS in 4 (6%) patients, and FEA in 1 (2%) patient. Seventeen (26%) patients received neoadjuvant chemotherapy. Five (8%) of the 65 patients had upgrade at their excisional biopsy site, including four to DCIS and one to invasive carcinoma. Of these 5 upgrades, three lesions were located ipsilateral to carcinoma whereas two lesions were contralateral. In the multivariate model, a high-risk lesion within 5cm of the ipsilateral malignancy was associated with an increased risk of upgrade to carcinoma (odds ratio [OR]=12.7, 95% confidence interval [CI] 1.32-122, p=0.03), and location of the high-risk lesion in the upper inner quadrant was associated with no residual disease (OR=12.2, 95% CI 1.88-78.8, p=0.009). Among patients with an ipsilateral lesion within 5cm of malignancy, 3/12 (25%) had carcinoma at excisional biopsy site and 2/12 (17%) had no residual disease. For the remaining patients with lesions contralateral to or greater than 5cm from ipsilateral carcinoma, 2/53 (3.8%) upgraded to carcinoma following excision and 16/53 (30.2%) had no disease. Among patients with persistence of the high-risk lesion, median maximum dimension (MMD) of the high-risk lesion was 1.15 cm (IQR 0.8-1.6 cm) on pathology, and MMD of the excisional biopsy specimen was 5.00 cm (IQR 4.05-5.98).

Conclusions: In this cohort of patients with concurrently identified breast carcinoma and high-risk lesion, lesion presence within 5cm of ipsilateral carcinoma was associated with increased upgrade rate. The 3.8% upgrade rate for high-risk lesions located greater than 5cm from ipsilateral malignancy or in the contralateral breast suggests that omission of excisional biopsy may be considered. For lower risk patients, omission of surgical biopsy could reduce excised tissue as size of excision cavity was more than double the max dimension of the actual lesion size. However, excisional biopsy of high-risk lesions within 5cm of ipsilateral malignancy is recommended given the 25% upgrade risk in our series.

Table 1. Multivariate multinomial logistic regression model

Table 1. Multivariate multinomial logistic regression model. No disease indicates that neither carcinoma nor residual high-risk lesion was identified on pathology following excisional biopsy. Upgrade to carcinoma designates the finding of either in situ or invasive carcinoma at the site of previously biopsy-confirmed high-risk lesion. Persistence of the high-risk lesion on final pathology was the reference outcome.

	No disease		Upgrade to Carcinoma	
	Odds ratio (95% CI)	p-value	Odds ratio (95% CI)	p-value
Distance from malignancy				
Contralateral or ipsilateral, >5 cm	Ref	-	Ref	-
Ipsilateral, ≤5 cm	0.65 (0.10-4.46)	0.66	12.7 (1.32-121.9)	0.03
Quadrant of high-risk lesion				
Upper outer	Ref	-	Ref	-
Upper inner	12.2 (1.88-78.8)	0.009	N/A	-
Lower outer	1.79 (0.41-7.94)	0.44	0.23 (0.02-3.19)	0.27
Central, subareolar, or lower inner	0.27 (0.03-2.67)	0.27	N/A	-

CI ≡ Confidence Interval; N/A ≡ not applicable, no events of interest observed; Ref ≡ defined reference group

1685843 - Granulomatous Mastitis - A Retrospective Analysis of Treatment Outcomes in Over 800 Patients

Nicole Nelson[1], Jazzalyn Zou[2], Kamil Khanipov[2], Kostiantyn Botnar[2], V. Suzanne Klimberg[2]

[1]University of Texas Medical Branch, League City, TX, [2]University of Texas Medical Branch, Galveston, TX

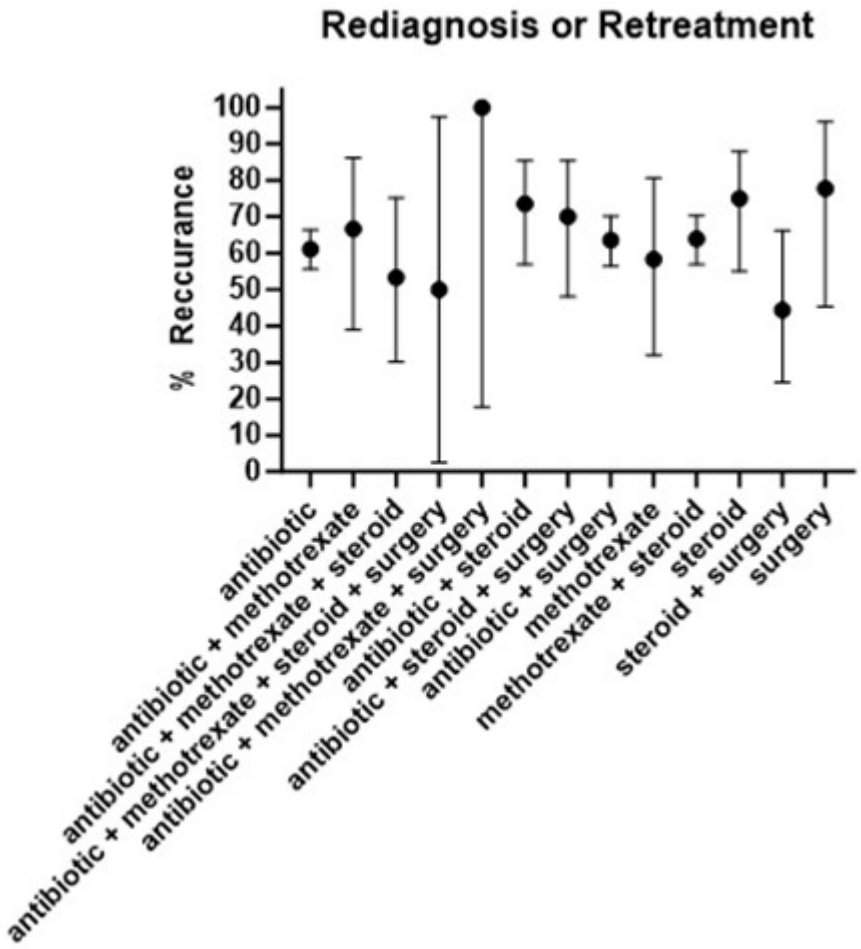
Background/Objective: Idiopathic Granulomatous mastitis (GM) is an uncommon inflammatory breast disorder that continues to present a challenge to physicians as it is a difficult disease to diagnose and manage. To date, there is little data looking at the natural history of the disease and comparing treatments and their effectiveness across a significant number of patients. We hypothesized that real-world data from healthcare organizations could be used to determine a superior treatment.

Methods: We utilized de-identified electronic health record data of around 105 million patients in 76 healthcare organizations through the TriNetX database to identify patients diagnosed with GM between 2015-2022. Outcomes measured included length of treatment time, whether more than one treatment was required, whether a repeat diagnosis of GM was given, and if repeat treatment was prescribed or performed without the concurrent diagnosis of a detracting diagnosis. Statistically, the data was queried using SQL expressions to extract treatment types utilized and determine the treatment length along with recurrence and retreatment rates. A comparison of individual treatments along with different combinations of therapies was performed in GraphPad Prism v10.

Results: A total of 1167 pts were identified who had records of treatments after a diagnosis of GM. 837 pts were treated within the analysis logic. Of those, 95.9% were female with 4.1% being male. The majority of patients were between the ages of 25 to 44. Hispanics were noted to have a 6-fold increased likelihood of being diagnosed with GM compared to Non-Hispanic or Latinos (0.006% compared to 0.001%). The most common treatment employed was antibiotic therapy followed by steroids, then surgery, and then methotrexate. The most common therapies utilized regardless of the treatment order were antibiotics alone (n = 308), antibiotics + steroids (n = 188), and steroids alone (n = 183). The length of time for all therapies showed no significant difference in treatment time regardless of the method of treatment employed. The length of time from the initial diagnosis/treatment and a re-diagnosis or re-treatment was not statistically significant among treatment types. Time from initial diagnosis and treatment to retreatment ranged from 31 to 2376 days with an average of 154 days. Of the patients that had recurrences, the most common therapies employed were antibiotics, antibiotics + surgery, and methotrexate + steroid. There was no significant difference in recurrence or retreatment rates among the different therapies or combinations of therapies utilized. (Figure 1)

Conclusions: The recurrence and retreatment rates for GM were not significantly different among different treatment types or combinations of treatment types. There was no superior method of treatment for GM based on our review. This emphasizes the need for further research to better understand the etiology and optimal treatment strategies for GM.

Figure 1.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1688068 - Risk Factors Associated with the Timing of Subsequent Breast Cancer Diagnosis Among Those with Proliferative Atypical Lesions of the Breast in a Diverse Patient Cohort

Jessica Limberg[1], Amanda Nash[1], Samantha Thomas[2], Koumani Ntowe[1], Juliet Dalton[1], Akiko Chiba[1], Jennifer Plichta[1], Shelley Hwang[1]

[1]Duke University Medical Center, Durham, NC, [2]Duke Cancer Institute, Durham, NC

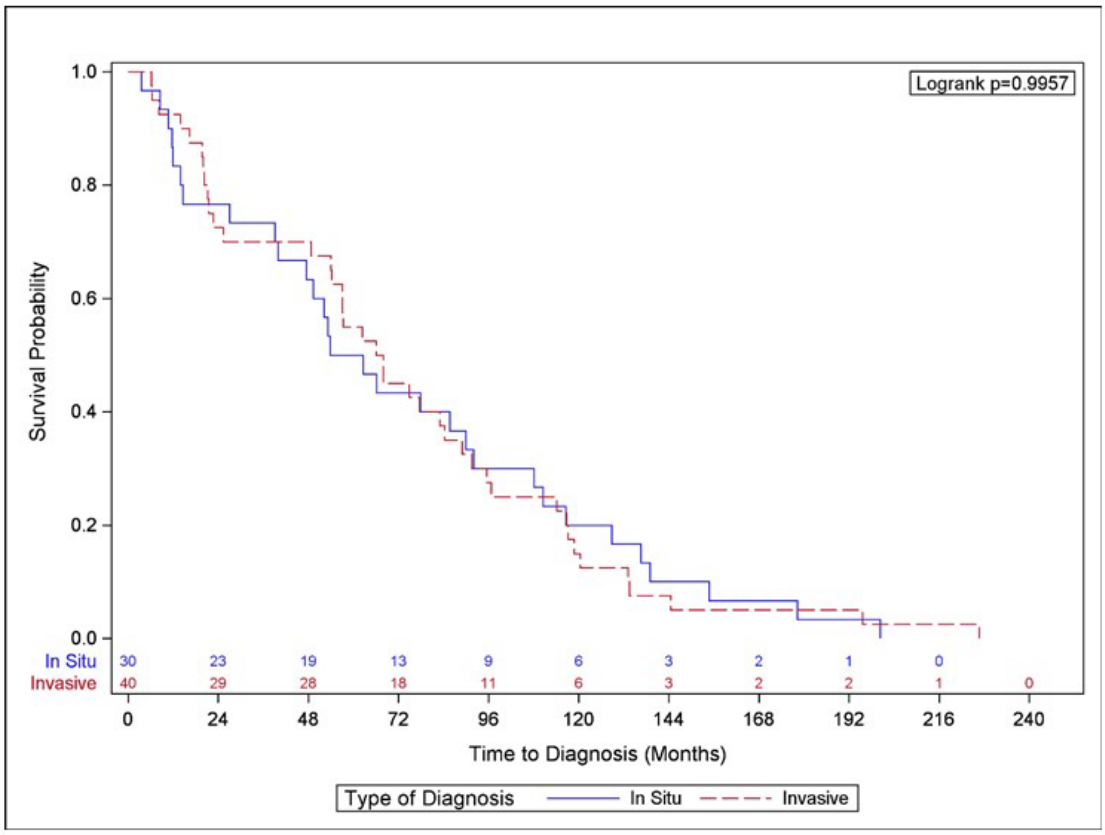
Background/Objective: Proliferative atypical lesions of the breast, including atypical ductal hyperplasia (ADH) and lobular neoplasms (LN), represent a subset of benign entities which denote an elevated risk of ductal carcinoma in-situ (DCIS) and invasive breast cancer (IBC). However, the timing of subsequent breast cancer development is variable, and risk factors associated with an early versus late diagnosis have yet to be identified.

Methods: Patients diagnosed with breast atypia (ADH or LN) from 2008-2017 at a single academic center were identified, and, when applicable, stratified based on timing of subsequent breast cancer diagnosis. Those with breast cancer prior to or concurrent with the breast atypia were excluded. Early development was defined as DCIS or IBC diagnosed within 5 years of the initial atypia diagnosis. Unadjusted cancer-free survival was estimated using the Kaplan-Meier method. Demographics, clinicopathologic features, and use of chemoprevention were compared between early and late development groups.

Results: A total of 434 patients were included in the study; 75% diagnosed with ADH and 25% with LN. The median age of atypia diagnosis was 53 years (IQR 48-62), and the majority of patients were either Non-Hispanic White (64.5%) or Non-Hispanic Black (21.2%). Fifty percent had a family history of breast cancer, but very few (9.5%, n=7/74) had an identified pathogenic germline mutation. Breast tissue was mammographically dense in most patients (46.1% heterogeneous, 12.7% extremely), and only 11.1% (48/434) opted for chemoprevention after an atypia diagnosis. Over a median follow up of 7.4 (95% CI 7.0-8.2) years, 71/434 (16.4%) developed breast cancer, of which 57.7% were IBC and 42.3% were DCIS (Figure). Approximately half (34/71) of patients were diagnosed within 5 years of their initial atypia diagnosis, and 52% (37/71) were diagnosed after 5 years. Patients diagnosed early more often had ipsilateral disease (82.4% early vs 56.8% late), whereas contralateral disease was more common in the cohort of patients diagnosed later (14.7% early vs 40.5% late; p=0.03). In addition, patients who developed breast cancer early were older with a median age at diagnosis of 58 years (IQR 50-66) versus 53 years (IQR 47-61) for late development and had higher BMI: 30 (IQR 25-34) for early versus 26 (IQR 22-31) for late, although neither of these findings reached significance (both p>0.05). There was no association with the timing of development and race/ethnicity, family history, germline mutation status, breast density, type of atypia, or use of chemoprevention. The majority of breast cancers were small (79% either Tis/T1) with favorable subtypes [92% (65/71) ER positive, 88% (38/43) HER2 negative], with no difference in tumor biomarkers based on timing of diagnosis.

Conclusions: In a large cohort of patients with breast atypia and median follow up of 7.4 years, over 16% developed DCIS or IBC, with approximately half of the events occurring within the first five years following the initial atypia diagnosis. Early events were more likely to be ipsilateral, supporting that atypia signals both local as well as overall risk for DCIS and IBC.

Figure 1. Unadjusted cancer-free survival in patients diagnosed with breast atypia, stratified by type of breast cancer



Type of Breast Cancer	Total	Median Cancer-Free Survival (95% CI)
In situ	30	58.2 months (39.9-91.9)
Invasive	40	67.0 months (53.9-84.3)
Total	70	64.4 months (53.2-83.0)

One patient excluded due to unknown date of breast cancer diagnosis. Abbreviations: CI=confidence interval.

1687964 - Atypical Ductal Hyperplasia on Core Needle Biopsy: Assessing the Need for Surgical Excision

Amy Fernow[1], Bailey Johnson[1], Emily Shockey[1], Wynton Overcast[1], Kandice Ludwig[1], Folasade Imeokparia[2], JoAnna Hunter-Squires[1], Josh Manghelli[1], Carla Fisher[2]

[1]Indiana University, Indianapolis, IN, [2]Indiana University School of Medicine, Indianapolis, IN

Background/Objective: Surgical excision is currently recommended for patients with core needle biopsy (CNB) yielding atypical ductal hyperplasia (ADH) to rule out breast cancer. Studies have shown mixed upgrade rates with some models to suggest patients who can avoid surgery. We aimed to ascertain upgrade rates of ADH to cancer in a large, multi-hospital healthcare institution to help determine patients who may avoid surgery.

Methods: All patients diagnosed with ADH on CNB between the years 2013-2021 were identified using a radiology database by searching for patients with "atypical ductal hyperplasia" or "ADH" on CNB pathology reports. The primary outcome was upgrade rate to invasive cancer or ductal carcinoma in situ (DCIS) on excisional biopsy. Secondary outcomes included risk of upgrade to carcinoma based on size on initial imaging, number of biopsy cores, presence of ADH alone or with benign findings (fibroadenoma, fibrocystic changes, sclerosing adenosis, or apocrine metaplasia), presence of focal ADH, and presence of ADH with concurrent high-risk lesions (complex sclerosing lesion, radial scar, intraductal papilloma, lobular carcinoma in situ, atypical lobular hyperplasia, or flat epithelial atypia). Baseline imaging with mammogram, US, and/or MRI was used to determine the largest measured size of lesions.

Results: A total of 363 patients with ADH were identified. The median age of patients was 58 years, with a range between 31 and 85. 316 patients underwent excisional biopsy. The overall upgrade rate to carcinoma was 21%, with 15 being invasive and 51 in situ. There were no differences in upgrade rates for subgroups of patients with ADH (+/- benign finding, focal ADH only, concurrent high-risk lesions, p=0.16). Patients with ADH +/- other benign findings on CNB had an upgrade rate of 26%. Patients with focal ADH had an upgrade rate of 18%. Patients with ADH and another high-risk lesion noted on CNB had an upgrade rate of 17%. The average lesion size on imaging for patients with benign findings on excisional biopsy was 1.05 cm vs 1.51 cm for those who were upgraded (p=0.008). The average number of CNB samples for patients who had benign findings on excisional biopsy was 6.498 versus 6.689 for those who were upgraded to cancer (p=0.558). There were 47 patients (12.9%) followed with imaging who did not undergo excisional biopsy after CNB. Average time of follow-up imaging was 37 months. One patient in this group had subsequent changes on imaging which led to a diagnosis of DCIS made 21 months after CNB.

Conclusions: We identified a large group of patients diagnosed with ADH on core biopsy over multiple hospitals within a single healthcare system. For patients who underwent surgery for ADH, our upgrade rate to invasive cancer or DCIS was 21% indicating need for surgery in this group of patients. Increased size was a significant risk factor for upgrade. Number of CNB samples collected had no influence on upgrade rates. Based on our results, we continue to recommend surgical excisional biopsy for most patients with ADH.

1684853 - Evaluating Criteria for Observation of Atypical Ductal Hyperplasia on Percutaneous Biopsy

Christina Driscoll, Patricija Zot, Malvika Solanki, Carrie Olson, Kush Lohani, Tanya Hoskin, Amy Degnim

Mayo Clinic, Rochester, MN

Background/Objective: Atypical ductal hyperplasia (ADH) identified on percutaneous biopsy is associated with upgrade to cancer in approximately 15-25% of cases. Although surgical excision of the lesion remains standard of care, recent studies have identified criteria for omitting surgical excision in selected individuals with low (< 5%) risk of upgrade. Here we perform a retrospective external assessment of proposed criteria for observation of selected women with low risk ADH.

Methods: With IRB approval, a single-institution retrospective review was performed of patients with mammography screen-detected ADH diagnosed on percutaneous biopsy and excised in our breast surgical practice from March 2016 to December 2022, excluding individuals with BRCA 1 or 2 pathogenic variants, ipsilateral breast cancer, ADH within intraductal papilloma, and those who did not have both their percutaneous and excisional biopsy at our institution. Clinical, imaging, and pathology features were abstracted with chart review. Immediate outcomes were evaluated for cases meeting recommended criteria for low upgrade risk (calcifications only, >50% removal, 1-2 foci of ADH, no necrosis) vs all other cases. Statistical analysis was performed using a chi-square test; confidence intervals for estimated upgrade risk were calculated using the Wilson method.

Results: We identified 198 ADH lesions diagnosed on percutaneous biopsy and undergoing surgical excision among 196 unique patients (median age 55, range: 34-85). 169 had no prior history of breast cancer, while 29 had concurrent or prior history of contralateral breast cancer. Overall, 19/198 (9.6%) upgraded to cancer at excision (2 invasive breast cancer and 17 DCIS). Of the 198 ADH lesions, only 78 (39.4%) met all low-risk criteria. Among the 120 lesions not meeting low-risk criteria, the reason was presentation other than mammographic calcifications in 68 (56.7%; 51 mass lesion, 17 architectural distortion/asymmetry), while smaller numbers had other higher-risk features: n=13 with < 50% removal of calcs, n=47 with >2 foci of ADH, and n=18 with central necrosis on the percutaneous biopsy. For lesions meeting all low-risk criteria, the upgrade rate was 5.1% (4/78) (95% CI: 2.0-12.5%), compared to an upgrade rate of 12.5% (15/120) (95% CI: 7.7-19.6%) for lesions not meeting these low-risk criteria (p=0.07). Upgrades within the low-risk criteria group were 3 low grade DCIS (3.8%), and 1 invasive cancer (1.3%) measuring 2.4 cm (intermediate grade, ER+/Her2-, and node negative). In the one patient with upgrade to invasive cancer, three subcentimeter clusters of calcifications were seen on diagnostic mammogram with density level 3; core biopsy pathology showed 2 foci of ADH and 2 foci of ALH.

Conclusions: Among women with ADH on percutaneous biopsy, 39% met recently published low-risk for upgrade criteria (calcifications only with >50% removal, 1-2 foci, no necrosis) and had an actual overall upgrade risk of 5.1% (1.3% for invasive cancer). These data support the recommendation for prevention therapy and active surveillance, accepting a small risk of missed invasive cancer.

1686242 - Mastectomy Same-day Discharge Versus Overnight Observation Comparison of Readmission, Reoperation, Surgical Site Infection, and Deep Vein Thrombosis: An Analysis of National Surgical Quality Improvement Program (NSQIP) Data

Amanda Khouri[1], Rachel Handelsman[2], Natalie Joumblat[1], Sandra Tomlinson-Hansen[3]

[1]Kaweah Health/UC Irvine, Visalia, CA, [2]Kaweah Health Medical Center, Visalia, CA, [3]Lowell General/Tufts Medicine, Cambridge, MA

Background/Objective: The practice of admission versus same day discharge after mastectomy varies. In 2022, the American Society of Breast Surgeons issued guidelines on home recovery after mastectomy stating it was a safe option for the appropriate patient. Previous analysis of NSQIP data from 2005-2012, and 2016-2018 showed no increase in 30-day complications in same day discharge patients. However, no recent analysis of NSQIP mastectomy only data has been performed comparing same-day discharge and admitted patients with specific endpoints such as DVT, SSI, and unplanned readmission and reoperation. This data analysis aims to provide the surgeon up to date analysis of these endpoints.

Methods: NSQIP data with mastectomy CPT codes (19303, 19304, 19305, 19306, 19307) from 2014-2019 were obtained. Male patients and patients who underwent concurrent bilateral oophorectomy or plastic surgery were excluded. The exposure variable for the study, a dichotomous distinction between inpatient and outpatient procedures is the NSQIP variable INOUT. For each outcome we carried out a cohort study comparing inpatients and outpatients retained or sent home on the same day. Quadruples consisting of one person in each combination of INOUT and retained, matched, with replacement, on CPT code and year of the procedure, BMI category, and age to within 4 years, history of congestive heart failure and bleeding disorder were created and used in three different analyses of the incidence of each outcome: conditional Poisson regression, Cox proportional hazards model, and a multi-level Weibull survival model.

Results: During the five-year period, 37,494 mastectomies were performed, with 34,103 retained overnight and 3,391 discharged the same day. White patients made up 26,226 of those undergoing mastectomies, African-Americans made up 3,903, Asians made up 2,072, American Indian/Alaska Natives made up 52, and Native Hawaiian/Pacific Islander made up 167 of the mastectomies in our study. Most patients did not have post-operative complications, but 84 same day discharge patients and 1,965 admitted patients had an unplanned return to the operating room. 94 patients discharged the same day and 1,523 admitted patients had an unplanned readmission. 96 patients discharged the same day and 1,008 admitted patients developed surgical site infections (SSI). 2 same day discharge patients and 99 admitted patients developed DVT/thrombophlebitis. The odds ratio for SSI for retained patients was 0.64 [0.51, 0.80]. The odds ratio for Readmission was 1.12 [0.92, 1.36]. The odds ratio for Reoperation was 1.83 [1.51, 2.21].

Conclusions: Our data demonstrate that outpatients with same day discharge may fare better than their admitted counterparts when it comes to complications such as reoperation, readmission, and possibly DVTs when controlling for year of procedure, BMI, age within 4 years, and history of CHF and bleeding disorder. The overall rate of DVTs was higher in patients retained overnight, however the rate of this complication is so rare the data is not conclusive about this endpoint. Interestingly, same day discharge patients did have higher rates of SSI. This may be related to less optimal wound and drain education in the immediate post-mastectomy period. This warrants additional investigation in future study.

Table 1: Results of cohort analysis

OUTCOME	ANALYSIS[1]	Outpatient Sent Home	Inpatient Sent Home	Inpatient Retained	Outpatient Retained
SSI	Conditional Poisson	1.00 [ref.]	0.58 [0.47, 0.73]	0.71 [0.57, 0.88]	0.64 [0.51, 0.80]
	Cox PH	1.00 [ref.]	0.61 [0.16, 2.30]	0.73 [0.47, 1.13]	0.67 [0.42, 1.07]
	Multi-level Weibull	1.00 [ref.]	0.61 [0.49, 0.76]	0.73 [0.59, 0.90]	0.67 [0.54, 0.83]
DVT	Conditional Poisson	1.00 [ref.]	0.00 [0.00, .]	3.46 [1.32, 9.03]	3.97 [1.55, 10.20]
	Cox PH	1.00 [ref.]	0.00 [0.00, 0.00]	2.67 [0.57, 12.47]	3.00 [0.56, 16.23]
	Multi-level Weibull	1.00 [ref.]	0.00 [0.00, .]	2.67 [1.04, 6.82]	3.00 [1.19, 7.57]
READMISSION	Conditional Poisson	1.00 [ref.]	2.60 [2.17, 3.12]	1.28 [1.06, 1.55]	1.12 [0.92, 1.36]
	Cox PH	1.00 [ref.]	1.96 [0.84, 4.55]	1.26 [0.81, 1.98]	1.13 [0.71, 1.81]
	Multi-level Weibull	1.00 [ref.]	1.96 [1.65, 2.34]	1.27 [1.05, 1.53]	1.13 [0.93, 1.37]
REOPERATION	Conditional Poisson	1.00 [ref.]	2.19 [1.81, 2.65]	2.33 [1.93, 2.81]	1.83 [1.51, 2.21]
	Cox PH	1.00 [ref.]	1.80 [0.78, 4.20]	1.94 [1.19, 3.15]	1.65 [1.00, 2.73]
	Multi-level Weibull	1.00 [ref.]	1.82 [1.51, 2.19]	1.95 [1.62, 2.35]	1.66 [1.37, 2.01]

[1]Results are shown as IRR [95% CI] for Conditional Poisson model, and HR [95% CI] For Cox PH and Multi-level Weibull models.

1685160 - Impact of Anti-estrogen Therapy on the Vaginal Microflora in Breast Cancer Patients

Hayley Petit[1], Alison Coogan[2], Supriya Mehta[2], Cristina O'Donoghue[2], Andrea Madrigrano[2]

[1]Rush University Medical College, Chicago, IL, [2]Rush University Medical Center, Chicago, IL

Background/Objective: Bacterial vaginosis (BV) is a common condition that affects 29% of women in the United States and is caused by an overgrowth of anaerobic bacteria that overwhelms the estrogen-reliant vaginal Lactobacilli. Given the relationship between estrogen and vaginal Lactobacilli, we aimed to investigate the occurrence of BV in patients receiving anti-estrogen therapies for breast cancer.

Methods: This retrospective cohort study employed the PearlDiver Mariner Database of de-identified all-payer insurance claims. International Classification of Diseases (ICD)-9, ICD-10, Current Procedural Terminology (CPT), and national pharmaceutical codes were used for data collection out of the 161 million patients with records from 2010-2022. The first diagnosis of breast cancer in female patients who had records at least one year before and after diagnosis without a history of gynecologic malignancy were included. Exposure groups were (1) patients between the ages of 20-50 taking tamoxifen, and (2) patients over the age of 50 taking aromatase inhibitors (AI), for at least five years without a lapse in prescriptions greater than one year. Control groups were breast cancer patients of the same ages not taking either medication. Within the 20-50 age groups, the maximum age at first breast cancer diagnosis was 45 in order for five years to pass prior to age 50. Study groups were matched based on age, location, and insurance plan. The outcome for analysis was the first occurrence of BV over five years vs. remaining without a BV diagnosis. Chi-square and risk ratios (with 95% Confidence Intervals [CI[) were used to compare BV occurrence between cases and controls.

Results: A total of 6,204 patients were included in the tamoxifen exposure group and 6,204 patients were included in the matched control group. Within these groups, the median age was 41 (interquartile range [IQR]: 38, 43). These patients were most commonly from the South (35.38%, n=2,195) and the majority had commercial insurance (88.62%, n=5,498). Over the study period, 10.74% (n=666) of patients taking tamoxifen developed BV compared to 9.14% (n=567) of patients who did not take tamoxifen (p-value: < 0.01; risk ratio [RR]: 1.17, 95% CI: 1.06-1.31). There were 78,516 patients in the AI exposure group and 78,516 patients in the matched control group. Within these groups, the median age was 66 (IQR: 60, 72). Patients were most commonly from the South (39.80%, n=31,253) and the majority had commercial insurance (63.49%, n=49,846). During the study period, 2.52% (n=1,976) of patients taking an AI developed BV compared to 3.07% (n=2,411) of patients who did not take an AI (p-value: < 0.01; RR: 0.82, CI: 0.77-0.87).

Conclusions: This observational study demonstrates potential interactions between anti-estrogen therapy and the vaginal microflora. While previous studies have associated anti-estrogen therapies with atrophic vaginitis, comparison of the rate of BV amongst women taking and not taking these medications is novel. Further studies should evaluate the incidence of BV and vaginal microbiome composition in women taking anti-estrogen therapies stratified by breast cancer course and surgical treatment to better understand the relationship and identify potential therapeutic avenues for improved quality of life.

1664458 - Short-term Physical Recovery After Breast Cancer Surgery Predicts Long-term Functional Outcomes

Nur Amalina Che Bakri, Richard Kwasnicki, Tanusree Dutta, Chiara Rizk, Emmanuel Giannas, Hutan Ashrafian, Judith Hunter, Francis Henry, Simon Wood, Ara Darzi, Daniel Leff

Imperial College London, London, England, United Kingdom

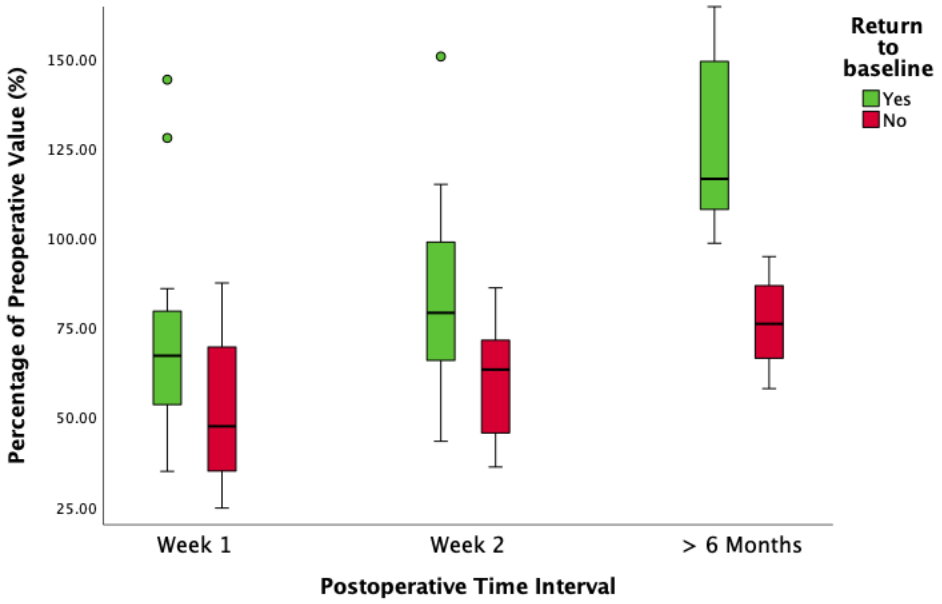
Background/Objective: Upper limb (UL) morbidity is poorly quantified and characterized. It is usually assessed using patient-reported outcome measures (PROMs). However, recall/response bias limits these measurements and makes post-operative morbidity and return to functionality estimations inaccurate. Our prior data shows that wearable activity monitor (WAM) is a reliable and unbiased objective tool for assessing UL impairment following breast surgery. Several studies have shown that breast cancer survivors who engage in physical activity (PA) have better outcomes. The early identification of patients with suboptimal activity levels can help mitigate their susceptibility to long-term complications. Previous research on WAMs in breast cancer patients focused on overall activity levels/step counts, rather than UL activity. To address this, here, we present short-term (perioperative) and long-term (6/12+) objective data to characterize longitudinal UL recovery and identify predictors of long-term functional outcomes. We hypothesized that short-term PA predicts long-term recovery.

Methods: A prospective, non-randomized, observational study was conducted from April 2019 to May 2023. Patients undergoing breast cancer surgery were identified from operating schedules. No restriction was placed on age. Patients who had a movement disorder, those using mobility devices/aids, or those with inadequate comprehension were excluded. At long-term follow up, patients were excluded if they had undergone additional operations or received new diagnoses since their initial operation that would significantly affect their mobility. Recruited participants were invited to wear WAMs on both wrists for an average of 3 days preoperatively, two weeks postoperatively, and for 72 hours at greater than 6 months post-operatively. They were asked to complete the Disability of Arm, Shoulder, and Hand and quality-of-life (EQ-5D-5L) questionnaires at pre-operative, post-operative weeks 1, 2, and at greater than 6 months.

Results: In a cohort of 38 patients, on average, 25455 data points were captured / patient. PA significantly decreased (as a percentage of pre-operative level) during the first and second weeks post-operatively (median PA: week 1=60.9% and week2=71.7% $p< 0.001$). After a median follow-up period of 2 years, on average PA returned to baseline (median PA: 105.6%, $p>0.05$) where 60% of the patients reached their baseline level (median PA=116.4%, $p>0.05$). If the 2-week PA was above 75%, patients were significantly more likely to return to baseline (OR:7.5, 95% CI 1.628-34.591, $p< 0.01$). Multivariate regression analysis demonstrated that the only independent predictor of long-term functional outcomes was short-term recovery observed 2-weeks post-operatively ($\beta= 0.752$, $p< 0.001$). In addition, DASH scores at week 1 were found to be predictive of long-term DASH scores ($\beta=0.361$, $p=0.046$).

Conclusions: Early two-week recovery is an independent predictor of long-term UL physical function. This underscores the critical significance of measuring and assessing the initial stages of recovery, as well as implementing measures to mitigate long-term functional impairment. WAMs have the potential to complement the current PROMs as predictive instruments, enabling the identification of individuals in need of further support in their rehabilitation process and promoting self-directed recovery. WAMs are highly suitable due to their ability to non-invasively and objectively measure activity levels and offer useful insights to both patients and clinicians.

Figure 1: Return to pre-operative activity levels and functionality. Physical activity as a percentage of pre-operative level significantly reduced to 60.9% (p<0.001) and 71.7% (p<0.001) at 1-week and 2-week post-operatively respectively. At median follow up of 2 years after their initial operation, patients on average had returned to their baseline level (median PA: 105.6% (p>0.05)) where 60% of the participants reached the baseline level where the median PA level was 116.4% (p>0.05).



1670225 - Quilting: A Simple and Effective Technique to Reduce Seroma After Mastectomy

Jamila Alazhri[1], Hussain Abdulla[2], Fatimah Alquriash[1], Salma Alghamdi[1]

[1]King Fahad Specialist Hospital, Dammam, Ash Sharqiyah, Saudi Arabia, [2]Salmaniya Medical Complex, Manama, Al Asimah, Bahrain

Background/Objective: Seroma is the most common complication after mastectomy. It is associated with risk of haematoma, skin flap necrosis, wound infection, delayed wound healing, lymphoedema, repeated visits to the clinic, increased costs and delay in starting adjuvant therapy. Fibrin glue, thrombin sealants, pressure dressing and shoulder immobilization have all been ineffective in preventing seroma. Drains are traditionally used to reduce seroma, however, they are associated with complications and prolonged need for care. Mechanical closure of the dead space using quilting sutures has been found to reduce the incidence of seroma and we have been applying this technique since 2020. The aim of this study was to examine the effect of quilting on postoperative seroma formation after mastectomy in patients who underwent quilting compared to those who underwent conventional wound closure.

Methods: We retrospectively reviewed all patients who underwent a mastectomy by a single surgeon at our center between 2020 and 2023. Those who had breast conserving surgery, immediate reconstruction after mastectomy or missing data were excluded. We collected the following from electronic medical records and drain charts: age at diagnosis, BMI, menopausal status, co-morbidities, history of neoadjuvant systemic therapy, axillary surgery, technique of wound closure, drain output and time to drain removal. Conventional wound closure involved deep dermal 3/0 Vicryl, followed by 3/0 or 4/0 Monocryl subcuticular suture for the skin. In the quilting technique, skin flaps were sutured to the pectoralis major muscle using interrupted deep dermal 3/0 Vicryl. Only one drain, regardless of axillary surgery, was used and it was removed if output was less than 30 ml per 24 hours for 3 consecutive days.

Results: Out of 76 patients, 44 patients underwent conventional wound closure and 32 had quilting suture. There were no significant differences in baseline characteristics between the two groups. On the first postoperative day, patients who underwent quilting had approximately 33% less volume of drainage than those with conventional wound closure (71.7 vs 106.7 ml, P = 0.006). Quilting suture was significantly associated with a shorter time to removal of the drain (8.35 vs 13.1 days, P = 0.007). Overall, the average drain output was lower in the quilted group (35.7 vs 40.8 ml, P = 0.205) and the rate of surgical site infection was less (13.6% vs 6.25%, P = 0.455), but these differences were not significant (Table 1).

Conclusions: The quilting suture technique after mastectomy reduces postoperative seroma and time to drain removal, compared with conventional wound closure. Quilting reduces healthcare consumption through reduction in complications, less number of clinic visits for drain-related care, shorter length of hospital stay, patient discomfort and associated expenses. This opens the possibility of omitting the use of a drain in patients undergoing quilting sutures after mastectomy, an interesting area for future research.

Table 1: Outcome comparisons between the two groups

Outcome	Conventional closure	Quilting suture	P value
Postoperative day 1 drain output (in ml)	106.7 ± 46.5	71.7 ± 34.6	**0.006**
Mean drain amount (in ml)	40.8 ± 28.5	35.7 ± 15.5	0.205
Time to drain removal (in days)	13.1 ± 7.1	8.35 ± 3.99	**0.007**
SSI	13.6%	6.25%	0.455
Wound complications	6.81%	3.12%	0.634

1688158 - Perioperative Events Among Triple-negative Breast Cancer Patients Following Neoadjuvant Chemoimmunotherapy vs Chemotherapy Alone

Maryam Khan[1], Yiming Li[2], Julia McGuinness[2], Sherene Ishtihar[2], Sharma Anurag[2], Stacy Ugras[2], Arith Reyes[2], Roshni Rao[3], Lisa Wiechmann[2], Bret Taback[2], Molei Liu[2], Luona Sun[2]

[1]Columbia University, New York, NY, [2]Columbia University Medical Center, New York, NY, [3]Columbia University Vagelos College of Physicians and Surgeons, New York, NY

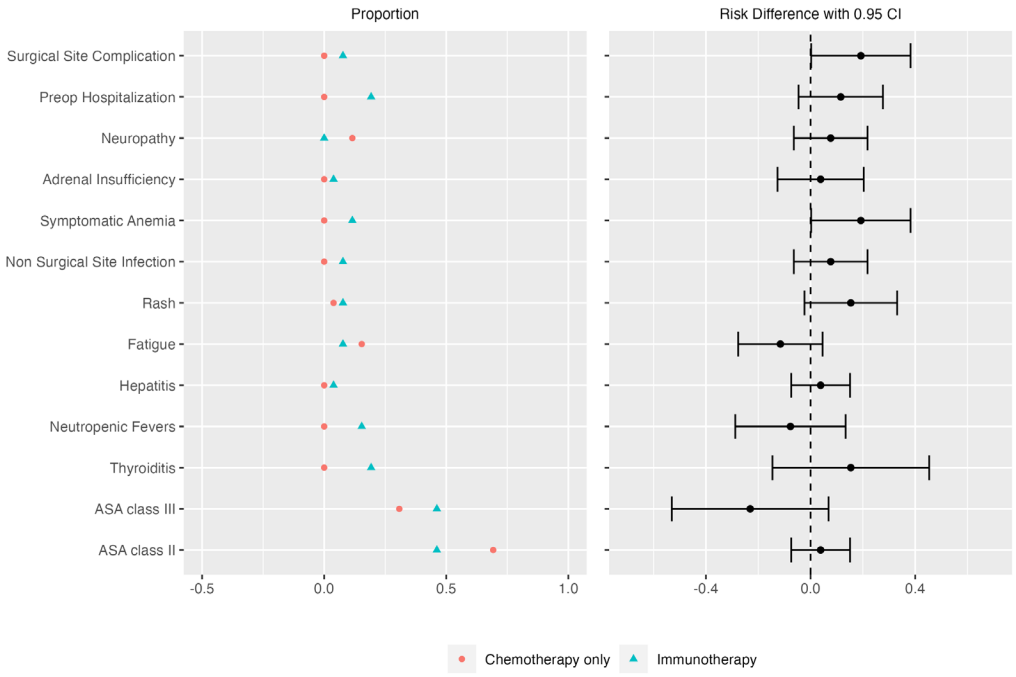
Background/Objective: KEYNOTE-522 study showed higher rate of pathologic complete response (pCR) and improved interim event-free survival (EFS) in Triple negative breast cancer (TNBC) patients treated with pembrolizumab in addition to neoadjuvant chemotherapy (NAC). Immune-related adverse events (irAE) were reported as 30-70%. IrAE from neoadjuvant treatment can potentially lead to adverse outcomes during the perioperative period. Perioperative outcomes of patients undergoing neoadjuvant chemoimmunotherapy vs chemotherapy alone were not well studied.

Methods: 26 patients with TNBC who received preoperative immunotherapy (pembrolizumab) (2017 - 2023) with or without chemotherapy at our institution were age and stage matched to 26 patients with TNBC who received preoperative chemotherapy alone (2016-2020). Clinical information such as cancer stage, American Society of Anesthesiologists (ASA) class, treatment regimen, perioperative medical complications, major hospitalizations, cardiac /cerebral accidents, and surgical complications were retrospectively reviewed within 30 days of perioperative period. Comparision of the two cohorts were done with Two Sample Proportion Test. Risk differences with 0.95 confidence intervals (CI) was configured via R.

Results: The mean patient age from both cohorts was 55. Each cohort matched 6 patients of stage I, 16 of stage II, 4 of stage III. In preoperative immunotherapy group, 12 patients were ASA II, 12 patients were ASA III ; versus (vs.) 18 of ASA II (p= 0.16), 8 of ASA III (p=0.39) in preoperative chemotherapy group. 20 patients in chemotherapy group completed AC-T (Adriamycin/Cytoxan/Taxol), compared to 5 patients in immunotherapy group. Comparing immunotherapy to Chemotherapy group, 15 vs. 11 patients received breast conservation treatment; 7 vs. 9 had mastectomy; 3 vs. 6 had Mastectomy with reconstruction, respectively (p= 0.40). No patients in the chemotherapy group developed any of the following complications vs the immunotherapy group: 5 patients presented with thyroiditis (p=0.06), 4 with neutropenic fever (p=0.12), 1 with hepatitis (p= 1.00), 2 with non-surgical site Infection (p=0.47), 3 with symptomatic anemia (p=0.23), 1 with Adrenal Insufficiency (p= 1.00), 5 patients required preoperative hospitalization (p= 0.06) and 2 developed surgical site complications (p=0.47). Patients in the chemotherapy group were more likely to develop neuropathy (3 patients vs 0; p= 0.23), and fatigue (4 patients vs 2; p= 0.66). 5 immunotherapy patients needed preoperative cardiac consultation vs 6 in chemotherapy group. 2 patients had rash in immunotherapy group versus 1 in chemotherapy group. (p=1.00). 13 patients had abnormal glucose level in immunotherapy group, vs 17 patients in chemotherapy group. 10 patients had anemia in immunotherapy group with 20 patients in chemotherapy group. No electrolytes derangement, no cardiac arrest or cerebral vascular accidents, no major bleeding events in either cohort during perioperative period. However, when comparing overall risks of all above complications, immunotherapy group had a higher overall risk than chemotherapy group. (relative risk=2.5, p= 0.0357, CI 1.05- 6.56)

Conclusions: Despite no significant differences in each perioperative risk/complications due to the small sample size, immunotherapy group still has a significantly higher overall risk compared to chemotherapy group during perioperative period. Larger studies are needed to infer the risk of each single complication.

Figure 1: Perioperative events confidence intervals following neoadjuvant chemoimmunotherapy vs chemotherapy alone



1688473 - Negative Pressure Wound Therapy in Patients Undergoing Breast-conserving Surgery for Breast Cancer: The LAUREN-trial

Nick Servaas[1], Merel Spiekerman van Weezelenburg[2], Loeki Aldenhoven[3], Merel Kimman[4], Elisabeth van Haaren[2], Alfred Janssen[2], Milou Martens[2], Yvonne Vissers[2], Geerard Beets[5], James van Bastelaar[2]

[1]Zuyderland Medical Centre, Sittard-Geleen, Maastricht, Limburg, Netherlands, [2]Zuyderland Medical Centre, Sittard-Geleen, Limburg, Netherlands, [3]Zuyderland Medical Center, Sittard-Geleen, Limburg, Netherlands, [4]Maastricht University Medical Centra, Maastricht, Limburg, Netherlands, [5]Antoni van Leeuwenhoek, Sittard-Geleen, Limburg, Netherlands

Background/Objective: Breast cancer patients are more often treated with breast conserving surgery, with 37% of the procedures being breast conserving in the Netherlands in 1989 to 61% in 2022. Complication rates after breast conserving surgery for breast cancer are 2-17%. Complications such as surgical site infections (SSI), wound dehiscence, abscess, hematoma, or seroma are seen after breast conserving surgery. Negative pressure wound therapy (NPWT) is used to reduce complications of closed surgical wounds and improve postoperative outcomes. This study aims to identify the effect of NPWT on surgical outcomes and wound complications after breast conserving surgery for breast cancer.

Methods: This is a Dutch two-arm interventional study which includes a total of 300 patients receiving breast conserving surgery for breast cancer with or without sentinel node procedure. A prospective interventional cohort of 150 patients receiving NPWT will be compared to a retrospective cohort of 150 patients who did not receive NPWT. The follow-up period is 3 months. The primary objective of this study is to evaluate the difference in wound complications (SSI, wound dehiscence, abscess, hematoma, seroma) in patients with and without NPWT. Secondary objective is to assess the burden for patients by assessing pain scores, EQ-5D-5L questionnaires and semi-structured interviews. The semi-structured interviews were conducted in the first 20 patients of the interventional cohort, and focused on general experience, physical complaints, user-friendliness, interference in daily, recommendations and QoL. In addition, a hospital-based cost assessment will be performed using costs related to complications, NPWT and unscheduled visits.

Results: Preliminary results into the effect of NPWT on complications after breast conserving surgery will be presented at the ASBrS 2024. As of now, 44 patients are included in the prospective cohort. Approximately 90-100 patients are expected to be included in the prospective cohort in April 2024. In general, NPWT was not perceived as a burden. Among the concerns voiced, itching during the treatment and practical issues including the length of tubing and device stability were most frequently mentioned. The treatment did not interfere with daily activities. Quality of life was comparable to patients not undergoing NPWT after breast conserving surgery for breast cancer. Almost all (95%) of patients would recommend NPWT to others.

Conclusions: Negative pressure wound therapy seems feasible in patients undergoing breast conserving surgery. We expect the complication rate to be reduced by 50%. We look forward to presenting the preliminary clinical results at the ASBrS 2024 conference.

1684911 - Drain-free Mastectomy and Flap Fixation: The Interim Analysis of a Randomized Controlled Non-inferiority Trial

Merel Spiekerman van Weezelenburg[1], Lisa de Rooij[1], Loeki Aldenhoven[2], Sander van Kuijk[3], Elisabeth van Haaren[1], Alfred Janssen[1], Yvonne Vissers[1], Geerard Beets[4], James van Bastelaar[1]

[1]Zuyderland Medical Centre, Sittard-Geleen, Limburg, Netherlands, [2]Zuyderland Medical Center, Sittard-Geleen, Limburg, Netherlands, [3]MUMC+, Maastricht, Limburg, Netherlands, [4]Antoni van Leeuwenhoek, Sittard-Geleen, Limburg, Netherlands

Background/Objective: Flap fixation after mastectomy has proven to be one of the most promising solutions to reduce seroma formation. Drain placement is however still standard practice in many breast cancer clinics, even though this may be redundant after flap fixation. This paper describes the interim analysis of the Seroma reduction and drAin fRee mAstectomy (SARA) trial.

Methods: This is a prospective randomised controlled trial comparing mastectomy and wound closure using flap fixation with or without drain placement. The primary outcome measure was the incidence of clinically significant seroma (CSS). Secondarily, wound complications, unscheduled visits, pain scores and cosmetic results were assessed. The aim of this interim analysis was to assess the assumptions for the sample size calculation and to provide preliminary results.

Results: Between July 2020 and January 2023, 112 patients were included. CSS incidence was 9.1% in the drain group and 21% in the no-drain group. In total, 10 patients were lost to follow-up. These numbers are similar to the ones used for the sample size calculation. In the drain group, 3 patients required interventions for wound complications compared to 9 in the no-drain group (odds ratio: 3.612 (95% confidence interval: 0.898-14.537)).

Conclusions: The sample size calculation seems to be correct and the trial does not need any protocol amendments. Current preliminary results show no significant differences in CSS incidence between the drain and no-drain group. Complete results should be awaited to draw a well-powered conclusion regarding drain policy after mastectomy.

Table 1. Primary and secondary outcome measures

	Drain (n=55)	No drain (n=57)	Difference in proportion (95% CI)	p-value
Overall seroma, n(%)	34 (62)	43 (75)	+13.0% (-4% - +30%)	0.140
CSS, n(%)	5 (9.1)	12 (21)	+11.9% (-1% - +25%)	0.077
Seroma related interventions				
Aspirations	2 (3.6)	7 (12)	+8.4% (-2% - +18%)	0.099
Aspirations + oral antibiotics	0	2 (3.5)	+3.5% (-1 - +8%)	0.162
Oral antibiotics	1 (1.8)	0	-1.8% (-5% - +2%)	0.309
Surgical debridement	1 (1.8)	1 (1.8)	0	1.000
Surgical debridement + VAC therapy	1 (1.8)	1 (1.8)	0	1.000
Surgical debridement + aspirations	0	1 (1.8)	+1.8% (-2 - +5%)	0.318
Median seroma aspirations, mL	175 (150 - -)	490 (255-608)		0.273
Wound complications, n(%)				
Total	8 (15)	11 (19)	+4.0% (-1% - +18%)	0.574
SSI	3 (5.5)	6 (11)	+5.5% (-5% - +16%)	0.292
Dehiscence	1 (1.8)	0	-1.8% (-5% - +2%)	0.309
Hematoma	1 (1.8)	4 (7.0)	+5.2% (-2% - +13%)	0.182
Necrosis	3 (5.5)	1 (1.8)	-3.7% (-11 - +3%)	0.294
Wound complication related interventions				
Oral antibiotics	1 (1.8)	4 (7.0)	+5.2% (-2% - +13%)	0.182
Surgical debridement	2 (3.6)	3 (5.3)	+1.7% (-6% - +9%)	0.663
Surgical debridement + VAC therapy	0	2 (3.5)	+3.5% (-1% - +8%)	0.162
Patients with unscheduled visits, n(%)	13 (24)	21 (37)	+13% (-4 - +30%)	0.136
Median number of unscheduled visits	2 (1-3)	1 (1-2.5)		0.099
Median cosmetic score				
1 week	7 (5-8)	7 (5-8)		0.371
6 weeks	7 (5-8)	7 (5-8)		0.632
3 months	7 (4-8)	6 (4-8)		0.604
6 months	7 (5-8)	7 (5-8)		0.844
Median pain score				
1 week	2 (3-5)	2 (3-5)		0.457
6 weeks	2 (1-4)	2.5 (0-4)		0.681
3 months	2 (0-3)	2 (0-3)		0.402
6 months	0.5 (0-3)	0.5 (0-3)		0.276
Median pain score associated with drain	3 (1-4)	-		

CSS: clinically significant seroma, 95% CI: 95% confidence interval.

Continuous data is described as mean ± standard deviation and categorical data as absolute numbers (percentages).

1684967 - Prevention of Seroma Formation and Its Sequelae After Axillary Lymph Node Dissection: An Up-to-Date Systematic Review and Guideline for Surgeons

Merel Spiekerman van Weezelenburg[1], Maikel Bakens[2], Jean Daemen[1], Loeki Aldenhoven[3], Elisabeth van Haaren[1], Alfred Janssen[1], Yvonne Vissers[1], Geerard Beets[4], James van Bastelaar[1]

[1]Zuyderland Medical Centre, Sittard-Geleen, Limburg, Netherlands, [2]Zuyderland Medical Centre, Sitard-Geleen, Limburg, Netherlands, [3]Zuyderland Medical Center, Sittard-Geleen, Limburg, Netherlands, [4]Antoni van Leeuwenhoek, Sittard-Geleen, Limburg, Netherlands

Background/Objective: Seroma formation after axillary lymph node dissection (ALND) remains a troublesome complication with significant morbidity. Numerous studies have tried to identify techniques to prevent seroma formation. The aim of this systematic review and network meta-analysis is to use available literature to identify the best intervention for prevention of seroma after stand-alone ALND.

Methods: A literature search was performed for all comparative articles regarding seroma formation in patients undergoing a stand-alone ALND or ALND with breast conserving surgery in the last 25 years. Data regarding seroma formation, clinically significant seroma (CSS), surgical site infections (SSI) and hematomas were collected. The network meta-analysis was performed using a random-effects model and the level of inconsistency was evaluated using Bucher's method.

Results: Nineteen articles with 1962 patients were included. Ten different techniques to prevent seroma formation were described. When combining direct and indirect comparisons, axillary drainage until output is less than 50ml/24h for two consecutive days results in significantly less CSS. The use of energy sealing devices, padding, tissue glue or patches did not significantly reduce the incidence of CSS. When comparing the different techniques with regard to SSIs, no statistically significant differences were seen.

Conclusions: To prevent CSS after ALND, axillary drainage is the most valuable and scientifically proven measure. Based on the results of this systematic review with network meta-analysis, it seems to be best to remove the drain when output is < 50ml/24h for two consecutive days irrespective of duration. Since drainage policies vary widely, an evidence based guideline is needed.

Table 1. League table presenting the combined direct and indirect comparisons between different surgical measures for preventing CSS after ALND. Results are presented as OR (95%-CI). An OR<1 indicates a preference for the technique described in the column. Statistically significant differences are bold.

D24									
2.78 (0.48-16.05)	PAT								
0.54 (0.05-6.40)	0.20 (0.02-2.26)	ND							
12.69 (1.88-85.80)	4.57 (0.69-30.07)	**23.31 (1.80-301.38)**	PRO						
1.00 (0.10-9.68)	0.36 (0.04-3.41)	1.84 (0.11-31.34)	**0.08 (0.01-0.85)**	TG					
3.09 (0.54-17.59)	1.11 (0.20-6.15)	5.67 (0.50-64.67)	0.24 (0.04-1.58)	3.09 (0.33-28.97)	PAD				
1.71 (0.30-9.72)	0.62 (0.11-3.40)	3.15 (0.28-35.79)	0.36 (0.08-1.59)	1.71 (0.18-16.03)	0.56 (0.10-3.02)	ED			
1.85 (0.43-7.95)	0.66 (0.16-2.76)	3.39 (0.36-31.93)	**0.15 (0.03-0.73)**	1.85 (0.24-14.04)	0.60 (0.15-2.45)	1.08 (0.27-4.39)	PTG		
14.03 (2.97-66.3)	**5.05 (1.10-23.10)**	**25.77 (2.57-258.21)**	1.11 (0.36-3.36)	**14.04 (1.73-114.26)**	**4.55 (1.05-20.49)**	**4.09 (1.65-10.14)**	**7.60 (2.36-24.48)**	D50-2	
1.65 (0.47-5.83)	0.60 (0.18-2.01)	3.03 (0.37-25.25)	**0.13 (0.03-0.55)**	1.66 (0.25-10.95)	0.54 (0.16-1.78)	0.62 (0.24-1.63)	0.90 (0.43-1.87)	**0.15 (0.06-0.37)**	D50

Table 2. League table presenting the combined direct and indirect comparisons between different surgical measures for preventing CSS after ALND. Results are presented as OR (95%-CI). An OR<1 indicates a preference for the technique described in the column. Statistically significant differences are bold.
D24: 24 hour drainage, PAT: patches, ND: no drain, PRO: progressive drain removal, TG: tissue glue. PAD: padding, ED: energy devices, PTG: padding + tissue glue, D50-2: drainage until <50ml/24h for two consecutive day, D50: drainage until <50ml/24h.

1661641 - Biologic Absorbable Microporous Polysaccharide Particles for the Management of Post-operative Seroma in Breast Surgery: Results of a Prospective Non-randomized Study

Qurratulain Chougle[1], Susanna Polotto[2], Mangesh Thorat[1], Hisham Hamed[1], Ashutosh Kothari[1]

[1]Guy's & St Thomas NHS Foundation Trust, London, England, United Kingdom, [2]Nattingham Hospital, London, England, United Kingdom

Background/Objective: Seroma is a common yet undesirable sequelae following a range of breast surgeries. Several methods such as quilting of mastectomy flaps to the chest wall using sutures, drains, and surgical haemostatics have been described to reduce and even prevent post-surgical seroma. The aim of this study was to evaluate the impact of the use of a biological absorbable haemostatic powder (Arista®) on post-operative seroma formation.

Methods: We prospectively enrolled 100 consecutive breast cancer patients stratified by type of surgery (simple mastectomy only, axillary clearance only or both), with serial allocation to "no use" versus "use" of Arista®. All patients had 10F vacuum drain/s (one each for mastectomy and axillary clearance) placed at the time of surgery and drains were removed after output dropped below 50cc/day. The primary endpoint was the number of days to drain removal (continuous variable), with day of surgery as day 0. A secondary endpoint was the proportion of patients where the drain was removed before post-operative day (POD) 10.

Results: All 100 patients received per protocol treatment, 51 were allocated to Arista® use and 49 patients to "no Arista®". Surgery was performed in post-neoadjuvant setting in 17 of 49 in the "no Arista®" arm and in 14 of 51 in the Arista® arm. Patients in the Arista® arm became drain-free 1 day earlier ($p = 0.38$) than those in the "no Arista®" arm; median 10 vs. 11 days respectively. A greater proportion of patients, 41% in the Arista® arm vs. 28.5% in the "no Arista®" arm ($p = 0.186$) had their drain removed before POD10. In multivariate logistic regression analysis, Arista® doubled [Odds Ratio (OR) = 2.06; 95% Confidence Interval (CI) 0.77-5.51; $p = 0.15$) the chances of drain being removed before POD10.

Conclusions: In this pilot study, Arista® appeared to facilitate early drain removal. Although the results not statistically significant, perhaps due to small sample size, simple addition of Arista® doubles the probability of drain removal by POD 10. A larger randomised study is merited to confirm efficacy and cost-effectiveness of this simple intervention.

1684574 - Balancing Risks of Surgical Complications and Positive Margins for Patients with Elevated BMI and Invasive Lobular Carcinoma of the Breast: An Institutional Cohort Study

Israel Falade[1], Kayla Switalla[2], Astrid Quirarte[3], Molly Baxter[2], Daniel Soroudi[1], Harriet Rothschild[1], Shoko Abe[2], Karen Goodwin[2], Merisa Piper[2], Michael Alvarado[2], Bao-Quynh Julian[2], Cheryl Ewing[2], Jasmine Wong[2], John Rose[2], Laura Esserman[2], Robert Foster[2], Rita Mukhtar[2]

[1]University of California - San Francisco, School of Medicine, San Francisco, CA, [2]University of California - San Francisco, CA, [3]Carol Franc Buck Breast Care Center, University of California, San Francisco, CA

Background/Objective: Invasive lobular carcinoma (ILC), the second most common type of breast cancer after invasive ductal carcinoma (IDC), often leads to worse surgical outcomes, including higher positive margin and mastectomy rates. While the use of oncoplastic surgery has been shown to reduce positive margin rates by 60% in those with ILC, those with elevated BMI, who may not be able to achieve preoperative weight optimization, may face increased complications. Given the particular importance of oncoplastic approaches for reducing positive margin rates in those with ILC, we evaluated the relationship between operative approach and surgical complications in a population of patients with ILC and elevated BMI.

Methods: We retrospectively analyzed a cohort of patients with BMI ≥30 kg/m2 from a prospectively maintained institutional ILC database. The primary outcome was rate of surgical complications by type of procedure (lumpectomy, lumpectomy with oncoplastic closure/oncoplastic reduction mammoplasty [ORM], simple mastectomy, mastectomy with aesthetic closure, and mastectomy with reconstruction (skin sparing [SSM] or total/nipple sparing [TSSM]). The secondary outcome was positive margin rates by surgical approach, stratified by T stage. Pearson's chi-square test, ANOVA, and multivariable logistic regression were used for analyses.

Results: Of 804 ILC patients, 154 with stage I-III disease and BMI ≥30 kg/m2 were analyzed. Average age was 62.9 ± 11.6 years with an average BMI of 34.9 kg/m2. Overall, 35.7% of patients underwent lumpectomy alone, 24.0% underwent ORM, 11.0% underwent simple mastectomy, 5.8% underwent mastectomy with aesthetic closure, and 23.4% underwent mastectomy with reconstruction. The overall complication rate was 23.4%, similar in the breast conservation surgery (BCS) versus mastectomy groups (23.9% vs 22.6%, p=0.848). Patients who underwent lumpectomy or simple mastectomy had the lowest complication rates (18.2% and 11.8%, respectively), while patients undergoing ORM or mastectomy with reconstruction had the highest complication rates (35.5% and 25.0%, respectively). Among BCS patients, ORM had significantly higher rates of infection and wound healing complications compared to lumpectomy (24.3% vs 3.6%, p=0.003 and 10.8% vs 0%, p=0.013), but no difference in overall complications. Among mastectomy patients, there was no difference in overall complication rate between simple mastectomy, mastectomy with aesthetic closure, and mastectomy with reconstruction (11.8%, 33.3%, and 25% respectively). Positive margin rates overall were 28.5% and were significantly higher in patients who received BCS compared to mastectomy (37.4% vs 15.0%, p=0.003), with lumpectomy alone having the highest rate of positive margins (42.6%) when comparing between all types of procedures (p=0.027, Table 1).

Conclusions: In this cohort, we found that 23.4% of patients experienced a surgical complication after their first oncologic surgery, with a higher risk in those who underwent oncoplastic surgery or immediate reconstruction. Additionally, positive margins were significantly less common for BCS patients when ORM was utilized. Although simple mastectomy had the lowest overall complication rate and positive margin rate, this procedure may not align with patient goals for breast conservation or reconstruction. In ILC patients with elevated BMI, it is crucial to balance risks of surgical complications and positive margins to optimize outcomes and ensure shared decision making.

Table 1: Complication rates and positive margin rates by surgical procedure

Surgical Procedure (n overall, then % by T stage)	Overall Complication Rate (% overall and then by T stage)	P value (overall)	Positive Margin Rate (% overall and then by T stage)	P value (overall)
Lumpectomy alone (n=55)	18.2%	0.36	42.6%	0.027
T1 (43.6%)	8.3%		21.7%	
T2 (41.8%)	26.1%		47.8%	
T3 (14.6%)	25%		87.5%	
Lumpectomy with oncoplastic closure/ORM (n=37)	32.4%		29.7%	
T1 (32.4%)	25%		16.7%	
T2 (40.5%)	46.7%		26.7%	
T3 (27.0%)	20%		50%	
Simple Mastectomy (n=16)	11.8%		13.3%	
T1 (25.0%)	0%		0%	
T2 (31.3%)	20%		20.0%	
T3 (43.8%)	14.3%		16.7%	
Mastectomy with Aesthetic Closure (n=9)	33.3%		22.2%	
T1 (0%)	n/a		n/a	
T2 (55.6%)	40%		0%	
T3 (44.4%)	25%		50%	
Mastectomy with immediate reconstruction (SSM or TSSM, n=36)	25%		13.9%	
T1 (22.2%)				
T2 (36.1%)	25%		0%	
T3 (41.7%)	30.8%		15.4%	
	20%		20.0%	

1655226 - Medical Complication Rates of Concurrent versus Sequential Breast, Plastic, and Gynecologic Surgery

Alison Coogan, Lilia Lunt, Cristina O'Donoghue, Andrea Madrigrano

Rush University Medical Center, Chicago, IL

Background/Objective: Women with breast cancer may undergo multiple surgical procedures in a short time span, including the possibility of risk-reducing salpingo-oophorectomy (RRSO). These breast, plastic, and gynecologic surgeries may be offered during a concurrent surgery, or sequentially with separate trips to the operative room. Previous studies have shown that wound complication rates are similar between the two surgeries. As concurrent surgeries are longer, we sought to compare the medical outcomes, specifically respiratory, urinary tract infection (UTI), or venous thrombosis (VTE), between concurrent and sequential surgery.

Methods: PearlDiver-Mariner is a national, insurance claims database including 151 million unique deidentified patients records. Included patients underwent breast, plastic, and RRSO within 2 years. Patients who underwent RRSO and either mastectomy or any stage reconstruction surgery were considered concurrent surgery. We compared the rate of respiratory complications, UTI, and VTE, including pulmonary embolism (PE) within 30 days of surgery.

Results: We identified 11093 patients who met inclusion criteria; 2307 underwent concurrent surgery and 8786 underwent sequential surgery. Patients who underwent concurrent surgery had a lower rate of respiratory complications (0.6% vs. 1.5%, p=0.007). There was no statistically significant difference in the rate of UTI (p=0.178) or VTE (0.053). When controlling for age, insurance, region, and CCI, there was a lower adjusted odds ratio of developing respiratory complications (aOR 0.43, 95%CI 0.23-0.72), UTI (aOR 0.69, 95%CI 0.46-0.99), and VTE (aOR 0.58, 95%CI 0.36-0.88).

Conclusions: Concurrent mastectomy, reconstruction, and RRSO is a safe option for appropriate patients to reduce the burden of multiple surgeries. Although concurrent surgery may have a longer operating time, there is not an increased risk of respiratory complications, urinary tract infection, or venous thrombosis.

1633100 - Can Fragility Explain the Lack of Statistically Significant Effect of Prophylactic Antibiotics on Surgical Site Infections in Non-reconstructive Breast Cancer Surgery? A Methodological Survey

Zachary Brown[1], Tyler McKechnie[2], Amin Hatamnejad[2], Parvez Elena[2]

[1]McMaster University, Ancaster, ON, Canada, [2]McMaster University, Hamilton, ON, Canada

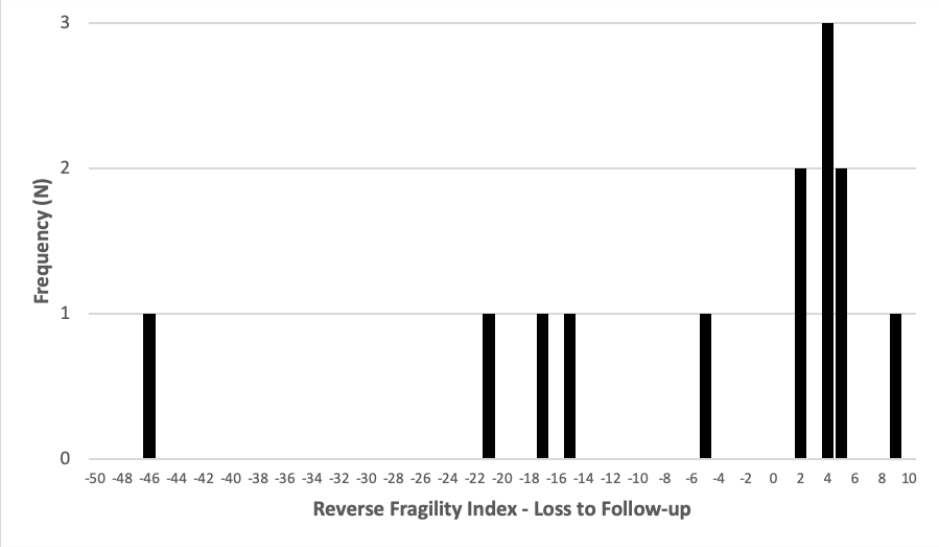
Background/Objective: Surgical site infection (SSI) incidence following non-reconstructive breast cancer procedures is markedly elevated in comparison to other clean procedures. The utility of antibiotic prophylaxis among this population has been controversial given that majority of trials have not demonstrated statistically significant effect. We applied the concept of reverse fragility index (RFI) to these trial -data.

Methods: Studies were identified through the most up-to-date Cochrane Review published on this topic in 2018 as well as a systematic review of PubMed and manual search of Google Scholar for publications after 2018. Randomized controlled trials (RCTs) comparing SSI rates in patients who did and did not receive prophylactic antibiotics undergoing non-reconstructive breast surgery that had a p-value of greater than 0.05 were included. The main outcome was RFI for each individual included RCT. Spearman's rank correlation coefficient was used to determine the association between RFI and research characteristics.

Results: A total of 13 RCTs, involving 3990 patients, were analyzed. The median RFI was 4 (IQR: 4-9). In 30.8% of the included studies, RFI was equal to or less than the number of patients lost to follow-up. Spearman's rank correlation demonstrated a moderate strength positive correlation between RFI and the number of events (p=0.024). More than half of the studies (53.8%) raised some concern for risk of bias, with 2 studies being classified as at high risk of bias.

Conclusions: RCTs evaluating preoperative antibiotic prophylaxis among patients undergoing non-reconstructive oncologic breast surgery that demonstrated a non-statistically significant difference in SSI incidence rely on a small number of outcome events and approximately one-third of trials have a number of patients lost to follow-up greater than RFI. This indicates that the current body of literature suggesting that preoperative antibiotic prophylaxis are not required prior to non-reconstructive breast surgery is fragile.

Figure 1: Reverse Fragility Index (RFI) subtract loss to follow-up (with negative values indicating greater proportion of patients lost to follow-up in comparison to RFI)



1684173 - Prognosis After Developing a Contralateral Breast Cancer: A SEER-based Analysis

David Lim[1], Vasily Giannakeas[2], Steven Narod[2]

[1]Women's College Hospital, Toronto, ON, Canada, [2]Women's College Research Institute, Toronto, ON, Canada

Background/Objective: Patients with breast cancer who experience a contralateral breast cancer have a higher mortality that women who do not. We have previously shown that the risk of contralateral cancer is approximately 0.4% per year (16% at 20 years). In general, the treatment for contralateral cancer is similar to those of the first primary ipsilateral cancer. We sought to identify prognostic factors that predict the risk of death from breast cancer after experiencing a contralateral cancer.

Methods: We identified 16,532 women with stage 0-III unilateral breast cancer in the SEER registry database who developed a contralateral breast cancer within 20 years of the first diagnosis. We excluded women treated with bilateral mastectomy or had stage IV breast cancer at initial diagnosis. We followed them from the date of contralateral breast cancer for breast cancer mortality for up to 10 years. We performed a Cox regression survival analysis to identify demographic, pathologic and treatment factors that were associated with breast cancer mortality after the contralateral cancer. We separated variables related to the first primary ipsilateral cancer and variables related to the second, contralateral cancer. 95% confidence limits were generated for all hazard ratios. P values < .05 were significant.

Results: We studied a cohort of 16,532 women who developed a contralateral breast cancer from six months to 20 years after experiencing a first primary breast cancer. In general, women were more often concordant than expected if the two cancers were independent. Concordance was observed for ER-status, PR status, HER2 status, lobular histology and ductal histology, with odds ratios ranging from 2.09 to 3.62. Of the contralateral breast cancers, 11,922 were treated with lumpectomy and 4610 were treated with unilateral mastectomy. The mean time from first cancer to contralateral cancer was 6.6 years. There were 2251 deaths from breast cancer following the contralateral cancer. The 10-year survival from breast cancer following a contralateral cancer was 78.4% (95% CI 77.4% to 79.3%). Of the factors related to the first breast cancer, those that were predictive of mortality after contralateral cancer included black race, lobular histology, invasive versus in situ, tumour grade, size, nodal status, and the use of radiotherapy. Of the factors related to the second breast cancer, short time to contralateral cancer was a significant predictor of mortality. Other factors that were predictive were earlier year of diagnosis, age at contralateral cancer less than 40 years, black race, size of contralateral cancer, nodal status and PR status. The effect of radiotherapy as treatment of the contralateral cancer was significant and was stronger than radiotherapy for the first cancer. The hazard ratio associated with chemotherapy for the contralateral cancer was 0.93 and was not significant ($p = 0.14$).

Conclusions: The risk of dying of breast cancer is high after experiencing a contralateral breast cancer. Prognostic factors for death following a contralateral cancer include those related to the first cancer and those related to the second cancer.

1686775 - Factors Associated with Contralateral Prophylactic Mastectomy in Young Women

Christopher Porter[1], Elizabeth Hedges[2], Arkadii Sipok[3], Lolita Ramsey[4], Shawna Willey[5], Arielle Stafford[1]

[1]INOVA Schar Cancer Institute, Fairfax, VA, [2]INOVA Fairfax Medical Center, Falls Church, VA, [3]Inova Fairfax Hospital, Falls Church, VA, [4]Inova Fairfax Medical Campus, Falls Church, VA, [5]INOVA Fairfax Hospital, Fairfax, VA

Background/Objective: Contralateral prophylactic mastectomy (CPM) is clearly indicated when there is a high-risk gene-mutation, however, there is no overall survival benefit with CPM in the average risk patient. While all patients have the option to pursue a CPM, young women may want to more strongly weigh the risk and benefits related to overall survival, mental toll, and ability to breastfeed. The aim of this study was to assess the factors associated with CPM over a 9 year period in young women (age $\leq$40).

Methods: This study was a secondary data analysis utilizing the American College of Surgeons' Cancer on Commission's (CoC's) National Cancer Database (NCDB) from 2012 to 2020. Females, age 18 or older, diagnosed with stage 0, I, II, or III breast cancer who underwent mastectomy during the study period were included. Patients with bilateral breast cancer or multiple primary breast cancers were excluded. Demographics, tumor staging, treatment, and mortality were analyzed. Descriptive statistics and Pearson's Chi-Square (two-sided, sig. $p \leq 0.05$) were conducted to compare women who had CPM vs. no CPM and stratified to a cohort of women age≤40.

Results: Of the 525,267 women who had a mastectomy, 214,331 (40.8%) elected for CPM. Of the 51,978 young women aged 18 to 40 who had a mastectomy, 33,207 (63.9%) elected CPM. Among young women, over time, a slightly higher proportion elected to do CPM—60% of young women opted for CPM in 2012 compared to 64% in 2020. In women ≤40, younger age 18-30, Caucasian race, private insurance, living in an area of higher income and education were significantly ($p < 0.001$) associated with CPM. 66.2% of those age 18 to 30 had CPM compared to 63.5% of those 31 to 40 years of age ($p < 0.001$). 67.2% of young Caucasian women chose CPM compared to 55% of young Black/African Americans. Privately insured patients underwent CPM more than Medicaid/Medicare or unknown/uninsured, (66.3% vs. 57% vs. 50.4%)($p < 0.001$). Women with lower clinical stage breast cancers elected for CPM more than higher staged patients, (Stage 0 61.5% vs. Stage I 68.4% vs. Stage II 64.4% vs Stage III 56.2%)($p < 0.001$). 69.1% of triple negative patients had CPM whereas only 62.9% of all other tumor prognostics did ($p < 0.001$). By oncotype DX, 64.5% of low-risk group and 69.8% of the high-risk group had CPM ($p < 0.001$).

Conclusions: 63.9% of young women age ≤40 who decided for mastectomy elected to have CPM compared to 40.8% of all women aged 18 to 90+. Race, insurance status, education, income level, clinical stage, tumor prognostics and genotype assays all factored into the decision to proceed with CPM. Further studies should explore variables that are not available in the NCDB, such as familial history of breast cancer and genetic mutation. Surgeons should have an informed discussion with young women on the risk and benefits of breast conservation therapy over mastectomy, breastfeeding, and the decision to proceed with contralateral prophylactic mastectomy.

1686715 - Rates of Contralateral Prophylactic Mastectomy in Early-stage Invasive Lobular Breast Cancer by Germline Variant Status

Astrid Quirarte[1], Alison Baskin[2], Amie Blanco[3], Julie Mak[3], Rita Mukhtar[4]

[1]Carol Franc Buck Breast Care Center, University of California, San Francisco, [2]University of California, San Francisco, CA [3]Cancer Genetics and Prevention Program, University of California, San Francisco, CA, [4]University of California - San Francisco, San Francisco, CA

Background/Objective: Patients with invasive lobular carcinoma (ILC) are more likely to undergo bilateral mastectomies compared to those with invasive ductal carcinoma (IDC). Although data are unclear, concerns about bilateral disease may drive this practice pattern. To our knowledge, there are no published reports regarding the impact of germline alterations on potential differences in the surgical management of women with ILC, and specifically differences in the utilization of contralateral prophylactic mastectomy (CPM). We determined the rates of bilateral mastectomy and bilateral breast cancer among women with early stage ILC by germline variant status and identified factors associated with CPM.

Methods: We cross-referenced institutional ILC and genetic testing databases to identify patients with stage I-III ILC who underwent genetic testing (1998-2021). We determined the frequency and type of pathogenic variants and variants of unknown significance (VUS) and evaluated the rates of bilateral mastectomy and contralateral malignancy (invasive carcinoma or ductal carcinoma in situ) by germline variant status. Using a logistic regression model adjusting for age, stage, germline variant status, and presence of contralateral malignancy, we identified factors associated with CPM.

Results: Of 245 patients who underwent genetic testing, 72.2% underwent multi-gene panel testing, 26.9% had BRCA 1/2 testing only, and 0.8% had site-specific testing. Pathogenic variants in breast cancer associated genes were identified in 29 patients (11.8%), most commonly in BRCA2 (n=10, 34.5%) and CHEK2 (n=4, 13.8%). VUS were identified in 85 patients (34.7%). Bilateral mastectomy was more common in patients with a pathogenic variant compared to no germline alteration (48.3% versus 26.9% respectively, p=0.024). There was no difference in the rate of bilateral mastectomy in those with a VUS compared to those without germline alteration (30.1% versus 26.9%). Overall, contralateral malignancy was identified in 14.3% of the cohort (17.2% of those with pathogenic variants, 12.9% with VUS, and 14.5% without germline alteration). These were identified pre-operatively in all patients with pathogenic variants, 90.9% of patients with VUS, and 72.2% of patients without germline alteration. Of the 74 patients who had bilateral mastectomy, contralateral malignancy was identified in 24.3% (21.4% with pathogenic variants, 20% with VUS, and 28.6% without). These malignancies were identified pre-operatively in all patients with pathogenic variants and were incidental postoperative findings in 20% of patients with VUS and 44.4% with no germline variant. In a multivariable model, CPM was associated with presence of pathogenic variant (OR 4.1, 95% CI 1.6-10.6, p=0.003), younger age (OR for each additional year of age 0.94, 95% CI 0.91-0.97, p=0.001), and presence of contralateral malignancy (OR 3.7, 95% CI 1.6-8.1, p=0.002).

Conclusions: In this cohort of patients with early stage ILC who underwent genetic testing, germline pathogenic variants were associated with significantly higher rates of CPM, whereas patients with VUS had similar rates of CPM compared to those without germline alterations. Germline pathogenic variant status was independently associated with CPM when adjusting for age, stage, and presence of contralateral malignancy. Better understanding of risk of contralateral malignancy, the impact of germline alterations, and long-term outcomes after CPM for patients with ILC is needed.

1688079 - When Two Is Better Than One: The Two-surgeon Approach to Bilateral Mastectomy With and Without Immediate Reconstruction

Mackenzie Lesh, Camille Swain, Carmen Lam, Erica Villa, Michelle Pershing, Mark Cripe, Deepa Halaharvi

Ohiohealth Grant Medical Center, Columbus, OH

Background/Objective: As women trend towards choosing bilateral mastectomy (BM) to address a high risk of developing or new diagnosis of breast cancer, there has been increased interest in a two surgeon approach (TS) to these procedures but only limited adoption. We aim to address gaps in the existing literature by evaluating outcomes of TS compared to traditional single surgeon approach (SS) when considering the type of mastectomy and immediate reconstruction performed.

Methods: We performed a retrospective review of adult female patients undergoing BM performed by two fellowship trained breast surgeons at our facility who regularly utilize TS from January 2015 to 2023. Patients were excluded if pregnant or if operating times were unavailable. Qualified patients were stratified into TS or SS. Anesthesia time, operating room time, mastectomy time, and length of stay were compared between TS and SS groups. Distinct mastectomy times were calculated for patients undergoing immediate reconstruction with plastic surgeons. Additional subgroup analyses included type of mastectomy and type of immediate reconstruction, when performed.

Results: 353 patients were identified as meeting criteria for initial analysis, with 312 patients in the TS group and 41 patients in the SS group. Immediate reconstruction was performed for 223/353 patients; 135 underwent implant-based reconstruction and 84 underwent deep inferior epigastric perforator (DIEP) reconstruction. Overall BM time was approximately 30 minutes shorter for TS (1.9 hours) compared to SS (2.5 hours). Sub-group evaluations reveal that the shortest lengths of stay, OR times, anesthesia times, and mastectomy times occurred for patients undergoing simple mastectomy with TS. Among patients undergoing immediate reconstruction, all evaluated times were decreased in patients undergoing implant-based reconstruction in the TS group but remained similar in patients undergoing DIEP reconstruction. An unexpected increase in evaluated times (excluding mastectomy time) for skin sparing mastectomy with TS is likely explained by an increased percentage of DIEP reconstruction in this sub-group, a procedure known to have longer operative times than implant-based reconstruction. TS decreased mastectomy time in all analyzed subgroups.

Conclusions: A two surgeon approach to BM consistently results in reduced mastectomy times for the breast surgeon, increasing time available for additional productivity. This is consistent with prior reports. To our knowledge, ours is the first study to report outcomes of TS accounting for types of mastectomy and reconstruction. The greatest benefits of TS were seen in simple mastectomy without immediate reconstruction as well as BM with immediate implant-based reconstruction. As these are the most commonly performed mastectomies nationwide, TS may provide an elegant solution to the increasing volume of BM procedures. Our findings support the utility of adopting TS more widely into breast surgical practice. Further sub-analysis, including axillary intervention, in a larger cohort may provide greater specificity as to groups most likely to benefit from this approach.

Table 1: Outcomes of bilateral mastectomy performed with single-surgeon vs. two-surgeon approach

	Anesthesia time (hrs)	OR time (hrs)	Mastectomy time (hrs)	LOS (days)
No Reconstruction				
Simple (TS)	**2.938**	**2.854**	**2.254**	**0.921**
Simple (SS)	3.426	3.387	2.642	1.375
Goldilocks (TS)	4.621	4.504	3.896	0.996
Reconstruction				
Implant (TS)	**3.766**	**3.66**	**1.738**	**1.11**
Implant (SS)	4.589	4.512	2.495	1.603
DIEP (TS)	8.841	8.721	**1.72**	3.737
DIEP (SS)	8.917	8.8	2.143	3.534
Skin Sparing (TS)	6.368	6.252	**1.701**	2.522
Skin Sparing (SS)	**5.848**	**5.757**	2.188	**2.168**
Nipple Sparing (TS)	**5.032**	**4.927**	**1.779**	**1.649**
Nipple Sparing (SS)	5.228	5.136	2.864	1.803

TS (Two surgeon approach); SS (Single surgeon approach); DIEP (deep inferior epigastric perforator flap); LOS (length of stay);

1677664 - The Van Nuys DCIS Experience: 25 Years Later

Kathryn Kelley[1], Michael Lagios[2], Melvin Silverstein[3]

[1]University of Southern California/Hoag Hospital, Pasadena, CA, [2]The Breast Cancer Consultation Service, Tiburon, CA, [3]University of Southern California/Hoag Memorial Hospital, Newport Beach, CA

Background/Objective: The Van Nuys Breast Center was the first free-standing multidisciplinary breast center in the United States. It existed from 1979-1998 and served as a model for many breast centers that followed. It began in the pre-screening era when ductal carcinoma in situ (DCIS) was a rare and poorly understood disease and generally treated with mastectomy. During the 1980s, screening mammography became available, improved over time, and began generating large numbers of patients with DCIS. With increasing cases, interest grew, and the Van Nuys team became expert in DCIS, developing the Van Nuys Classification and the Van Nuys Prognostic Index (VNPI). The Van Nuys Breast Center ended its tenure in 1998 with the publication of the first textbook devoted completely to DCIS. This abstract reflects the evolutionary experience and long-term outcomes analyzed by VNPI Scores for patients diagnosed with DCIS and treated during that historic time period.

Methods: Data from Van Nuys were reviewed. Patients with a final diagnosis of pure DCIS were included and divided into three local treatment groups (mastectomy, excision plus whole breast radiation therapy (WBRT), and excision alone) and analyzed using the VNPI. The VNPI assigns a score of 1-3 (1 being lowest risk of local recurrence; 3 the highest) to 4 parameters: tumor extent, margin width, age, and nuclear grade. This yields final total scores ranging from 4-12. Endpoints were local recurrence, quadrant of recurrence, regional or distant recurrence, breast cancer-specific survival and overall survival. Kaplan-Meier Analyses were used to predict recurrence probabilities. Curves were compared with the log-rank test.

Results: 853 patients with a diagnosis of DCIS were followed for a median of 9.94 years. Data comparing treatment groups are shown in the table.

Conclusions: This historic group of DCIS patients, diagnosed and treated in the early days of mammography, showed higher rates of local recurrence for all forms of breast conservation when compared with mastectomy. Local invasive recurrence probabilities were approximately 9% at 10-years for excision with or without radiation therapy and 1.5% for those treated with mastectomy ($P < 0.001$). Local recurrence for those treated with breast conservation was higher than would be expected today with current high-quality imaging, earlier diagnosis, and better treatment. Despite high invasive local recurrence rates for breast conservation, breast cancer-specific and overall survival were extremely high and equivalent to what was seen with mastectomy. Conservatively-treated patients with VNPI scores of 4, 5, or 6 did not benefit from the addition of radiation therapy. Conservatively treated patients with scores of 10, 11, or 12 had more than double the local recurrence rate if WBRT was omitted, but the difference was not significant due to small numbers of patients in those groups. Mastectomy offered the lowest risk of local recurrence across all VNPI scores but with no survival benefit. After 25 years of use, the VNPI, using four easily obtained parameters, continues to be a good predictor of local recurrence at no additional cost to the patient. DCIS, while considered cancer, seldom results in mortality, regardless of size, grade, or method of treatment.

Table 1: DCIS patients analyzed by treatment and Van Nuys Prognostic Index (VNPI)

	Mastectomy	Excision plus WBRT	Excision Alone	Total or Median or Average
Number of Pts	301	265	287	853
Median FU (yrs)	9.24	10.97	9.28	9.94
Average Size	61.7 mm	19.5 mm	19.1 mm	21.3 mm
Median Age	50	52	52	52
Total Recurrences (Inv + DCIS)	4	65	69	138
Total Invasive Recurrences	3	37	26	66
				P Value
5/10-Yr Prob All Local Recurrence (Inv + DCIS)	0.35%/2.2%	10.1%/17.4%	16.5%/25.3%	Mast vs RT, P < 0.001 Mast vs None, P < 0.001 RT vs None, P =NS
5/10-Yr Prob Invasive Recurrence	0.35%/1.5%	4.5%/9.1%	5.1%/9.2%	Mast vs RT, P < 0.001 Mast vs None, P < 0.001 RT vs None, P =NS
10-Yr Breast Cancer Specific Survival	99.3%	98.3%	99.5%	All P = NS
10-Year Overall Survival	91.1%	92.7%	91.0%	All P = NS
Subdivision by Van Nuys Prognostic Index				
5/10-Yr Prob Invasive Recur VNPI 4,5,6	N=29, Rec=0 0%/0%	N=57, Rec=2 0%/0%	N-115, Rec=2 1.0%/1.0%	All P = NS
P Value 4,5,6 vs 7,8,9	P = NS	P=0.008	P = 0.0003	
5/10-Yr Prob Invasive Recur VNPI 7,8, 9	N=146, Rec =0 0%/0%	N=172, Rec=24 5.0%/10.0%	N=145, Rec=18 3.1%/12.3%	Mast vs Rt, P < 0.001 Mast vs None, P <0.001 RT vs None, P = NS
P Value 7,8,9 vs 10,11,12	P = NS	P = 0.003	P = 0.017	
5/10-Yr Prob Invasive Recur VNPI 10,11,12	N=126, Rec=3 0.9%/4.2%	N=36, Rec=11 10.1%/22.2%	N=27, Rec=6 21.7%/58.3%	Mast vs Rt, P < 0.001 Mast vs None, P < 0.001 RT vs None, P = NS

1682603 - Nodal Surgery for Patients ≥70 Undergoing Mastectomy for DCIS? Choose Wisely

Elissa C Dalton[1], Cecilia Chang[2], Cassandra Cardarelli[1], Richard Bleicher[1], Mary Pronovost[3], Allison A Aggon[1], Andrea S Porpiglia[1], Austin Williams[1]

[1]Fox Chase Cancer Center, Philadelphia, PA, [2]NorthShore University HealthSystem, Evanston, IL, [3]Temple University Hospital, Philadelphia, PA

Background/Objective: Given the possibility of upstaging to invasive cancer on final pathology, current guidelines support sentinel lymphadenectomy (SLNB) in the setting of mastectomy for ductal carcinoma in situ (DCIS). Choosing Wisely advocates against routine use of SLNB in women ≥70 years with early stage HR+/HER2- invasive breast cancer, though it is unclear how to apply these guidelines in women ≥70 years with DCIS undergoing mastectomy. We sought to assess rates of axillary surgery among these patients, characteristics of those who upstage from DCIS to invasive cancer (≥pT1) or have positive lymph nodes (pN+), and whether axillary surgery impacts treatment decisions.

Methods: From the National Cancer Database (2012-2020), we identified female patients aged ≥70 years with DCIS who underwent mastectomy. We evaluated the rate of upstaging to ≥pT1, or pN+ among patients who underwent axillary surgery. We performed subset analyses of patients with ER+ DCIS, and assessed adjuvant therapies among patients who upstaged to ≥pT1 after stratifying by nodal status.

Results: We identified 9,030 patients ≥70 with DCIS undergoing mastectomy, 1,896 (21%) of whom upstaged to ≥pT1. Among patients with invasive cancer, 65% were HR+/HER2-, 23% HER2+, 13% triple negative. Overall, 7,718 (86%) patients underwent axillary surgery with 5,836 (65%) having SLNB alone. When considering final pathology (including upstage rate, tumor stage [pT1-2], and receptor subtype), 93% of the entire cohort and 97% of the 6,357 patients with ER+ DCIS could avoid axillary surgery when Choosing Wisely criteria were applied post hoc. The rate of nodal positivity among patients who did not upstage was 0.3% and was 12% among those who upstaged to ≥pT1 with < 2% of these patients having pN2-3 disease. Rates of nodal positivity did not differ by receptor subtype (p=0.27). Among all patients with ER+ clinical DCIS who underwent nodal surgery, 3% were pN1 and 0.3% were pN2-3 (Table). Overall, independent predictors of nodal positivity on multivariable analysis were Black race, Hispanic ethnicity, intermediate or high grade and presence of lymphovascular invasion (all p< 0.05). The use of adjuvant therapies was higher among node-positive HR+/HER2- patients than node-negative patients (chemotherapy: 87% vs. 60%, endocrine therapy: 20% vs. 2%, radiation: 26% vs 2%, all p< 0.001). However, even among node-positive patients there was no recommendation for adjuvant chemotherapy or radiation for 71% and 66% of patients, respectively.

Conclusions: Axillary surgery is not indicated in the vast majority of patients ≥70 with ER+ DCIS undergoing mastectomy based on the low rate of upstaging to invasive cancer or nodal positivity and current national recommendations for omission in patients with invasive cancer. Additionally, knowledge of nodal positivity does not appear to impact escalation of adjuvant therapy in most patients. The development of clinical guidelines, including the use of preoperative axillary imaging as recently reported in the SOUND trial, may assist in identifying patients who would benefit from axillary surgery.

Table 1: Nodal status of women ≥70 with DCIS undergoing mastectomy and axillary surgery stratified by ER status and upgrade to invasive cancer. [Note: All values are n (%); ER: estrogen receptor]

	ER+		ER-	
	pTis	≥pT1	pTis	≥pT1
n	4287	1277	1464	461
Pathologic Nodal Stage				
pNX	29 (0.7)	8 (0.6)	10 (0.7)	2 (0.4)
pN0	4225 (99.0)	1112 (87.2)	1441 (98.9)	396 (85.9)
pN1	12 (0.3)	139 (10.9)	5 (0.3)	50 (10.9)
pN2	0 (0.0)	12 (0.9)	1 (0.1)	10 (2.2)
pN3	1 (0.0)	5 (0.4)	0 (0.0)	3 (0.7)

1684253 - Recurrence Risk in Patients Undergoing Mastectomy for Ductal Carcinoma In Situ

Marissa Kuo[1], Jessica Sims[2], Odette Solis[1], Ingrid Meszoely[1], Raeshell Sweeting[1], Ana Grau[1], Kelly Hewitt[3], Rondi Kauffmann[1], Mark Kelley[1], Rachel McCaffrey[1]

[1]Vanderbilt University Medical Center, Nashville, TN, [2]Vanderbilt University School of Medicine, Nashville, TN, [3]Division of Surgical Oncology & Endocrine Surgery, Department of Surgery, Vanderbilt University Medical Center, Nashville, TN, USA, Nashville, TN

Background/Objective: The incidence of ductal carcinoma in situ (DCIS) is increasing secondary to increased detection on screening mammography. Up to 30% of patients choose to or are advised to undergo mastectomy for DCIS for a variety of reasons including significant span of disease, inability to undergo radiation therapy, or patient preference. Local recurrence after mastectomy for DCIS rates are reported as 1-2.6% in the literature. Risk factors for recurrence after mastectomy are not well defined, where known risk factors might guide additional surgery or adjuvant therapy decisions.

Methods: We aimed to identify risk factors that may contribute to recurrence of breast cancer following mastectomy for pure DCIS. We hypothesized that close or positive mastectomy margins, age at diagnosis, extent of breast disease and mutation carriers would be associated with increased risk of recurrence. We performed a retrospective chart review of patients who underwent simple or bilateral mastectomies for pure DCIS at a single academic tertiary referral center from 2013-2023. Demographic data, imaging reports, clinical notes, genetic testing results, and pathology details were queried and analyzed using descriptive statistics

Results: 165 patients met inclusion criteria with an average length of follow-up of 39.9 months. Average age on date of mastectomy was 54.5 (±11.8). 19 patients (11.5%) held prior diagnosis of breast cancer (64% invasive cancer, 36% DCIS). 86 (52%) patients elected to undergo bilateral mastectomies (versus simple mastectomy). Of 93 patients (56%) who underwent genetic testing, only 12 pathogenic mutations were identified (13% of those tested, 7% of total cohort) with BRCA2 pathogenic mutation beigng the most common. On final surgical pathology, average span of DCIS was 33.7mm (±24.6mm). 80.6% of patients had hormone receptor positive disease. 23 patients (14%) patients had < 1mm margins on final pathology and of those, 2 returned to the OR for re-excision. Only 1 (0.6%) patient had disease recurrence in the ipsilateral breast during the study period. This patient underwent a simple mastectomy with sentinel lymph node biopsy due to extensive span of calcifications on imaging. Patient had a 45mm span of DCIS with positive margins on initial surgical pathology and returned for re-excision, however developed recurrence (invasive mammary carcinoma) 5 years postoperatively.

Conclusions: Recurrence after mastectomy for pure DCIS is a rare event and in our study sample, only one recurrence occurred in a patient with a large span of disease and need for previous re-excision for positive margins. Risk factors for recurrence after mastectomy are not yet well defined and a similar analysis with a larger sample size and longer follow-up time could help inform need for additional adjuvant therapies.

Table: Multivariable Logistic Regression Model for Factors Associated with Omission of Surgery		
	OR [95% CI]	**P-Value**
Age		
70-74	REF	
75-79	1.13 (1.01-1.26)	**0.030**
80-84	1.43 (1.28-1.60)	**<0.001**
≥85	2.57 (2.3-2.86)	**<0.001**
Charlson Comorbidity Index		
0	REF	
1	0.81 (0.73-0.89)	**0.000**
2	1.08 (0.93-1.25)	0.323
≥3	1.34 (1.13-1.58)	**0.001**
Race/Ethnicity		
Non-Hispanic White	REF	
Black	1.68 (1.52-1.85)	**<0.001**
Hispanic White	1.06 (0.90-1.24)	0.478
Asian/Pacific Islander	1.12 (0.90-1.37)	0.292
Other/unknown	1.73 (1.31-2.26)	**<0.001**
Insurance Status		
Private	REF	
Medicaid/Medicare	1.27 (1.11-1.45)	**0.001**
Uninsured	2.21 (1.39-3.40)	**0.000**
Other/Unknown	1.56 (1.12-2.14)	**0.007**
Income		
< 40.000 USD	REF	
≥ 40.000 USD	0.89 (0.81-0.98)	**0.014**
Facility Type		
Community Cancer Program	REF	
Comprehensive Community Cancer Program	0.95 (0.83-1.09)	0.444
Academic Program	1.25 (1.09-1.44)	**0.002**
Integrated Network Cancer Program	0.94 (0.81-1.09)	0.386
Tumor Grade		
1	REF	
2	0.90 (0.73-1.13)	0.373
3	0.66 (0.53-0.82)	**<0.001**
Unknown	1.60 (1.25-2.05)	**<0.001**
Tumor Subtype		
TNBC	REF	
HR+/HER2+	1.55 (1.42-1.69)	**<0.001**
HR-/HER2+	1.41 (1.27-1.56)	<**0.001**
Stage		
II	REF	
III	3.45 (3.19-3.73)	**<0.001**
Chemotherapy		
Did not receive	REF	
Received	0.48 (0.44-0.52)	**<0.001**
Unknown	0.77 (0.57-1.02)	0.079

1671850 - Cost Containment Analysis of Superparamagnetic Iron Oxide (SPIO) Injection in Patients with Ductal Carcinoma In Situ

Odette Solis, Raeshell Sweeting, Ingrid Meszoely, Ana Grau, Rondi Kauffmann, Rachel McCaffrey, Mark Kelley, Kelly Hewitt

Vanderbilt University Medical Center, Nashville, TN

Background/Objective: Recent studies have established the safety and efficacy of Superparamagnetic Iron Oxide (SPIO, Magtrace®) for delayed sentinel lymph node biopsy (SLNB) in patients with ductal carcinoma in situ (DCIS) who are undergoing mastectomy. The aim of our study was to measure cost containment with use of Magtrace® in comparison to upfront SLNB with traditional technetium-99 lymphatic tracer.

Methods: A total of 41 patients at our institution underwent mastectomy with Magtrace® injection for DCIS between 2021-2023 and were included in our single-institution, retrospective analysis. For comparison, total charges data were obtained for an upfront SLNB at the time of mastectomy, including charges for injection of technetium-99, operating room and anesthesia charges (assuming an upfront SLNB added an additional average of 30 minutes of operative time to a mastectomy case), and associated pathology charges. Charges for isosulfan blue were excluded from our analysis as not all surgeons in the cohort utilized dual tracer for upfront SLNB. Cost comparison analysis was then performed against charges for intraoperative Magtrace® injection with additional charges incorporated for those patients who required return to the operating room for delayed SLNB. Total cost containment for the cohort with use of Magtrace® was then measured.

Results: Of the 41 patients who underwent Magtrace® injection, two patients required return to the operating room for a delayed SLNB for invasive disease. Even including these charges for a second encounter into our cost analysis, the use of Magtrace® still yielded an overall cost containment of $205,793.55 in our cohort when comparing to patients who underwent upfront SLNB. For patients who underwent Magtrace® injection and did not require return to the operating room, charges were reduced by $6,768.52 per patient compared to an upfront SLNB. For the two patients who underwent Magtrace® injection and required return to the operating room for delayed SLNB, additional charges averaged $27,087.37 per patient in comparison to upfront SLNB. The rate of return to the operating room for delayed SLNB at which Magtrace® would no longer be cost effective in our cohort was estimated to be >17%, or roughly 7 of 41 patients.

Conclusions: The use of Magtrace® for delayed SLNB in patients with DCIS undergoing mastectomy yielded a significant overall cost containment in our analysis. Our data further supports the use of Magtrace® in this patient population as both an effective and cost-savings alternative to standard upfront SLNB.

1688619 - Preoperative MRI and the Rate of DCIS Upstage to Invasive Cancer

Anthony Baez[1], Alyssa Marmer[2], Zeynep Ozdemir[3], Athanasios Sevdalis[4], Charles Dimaggio[4], Amber Guth[2], Freya Schnabel[2]

[1]NYU Grossman School of Medicine, Long Island City, NY, [2]NYU Perlmutter Cancer Center, New York, NY, [3]Istanbul University Cerrahpasa - Cerrahpasa School of Medicine, New York, NY, [4]NYU Grossman School of Medicine, New York, NY

Background/Objective: Ductal carcinoma in situ (DCIS) accounts for 20-25% of newly diagnosed breast cancers and is characterized by the presence of malignant cells confined to ductal structures. Reported rates of upstaging to invasive cancer at surgery vary widely (0-59%) and when upstaging occurs, additional procedures, including axillary staging, may be required. This study was designed to evaluate the benefit of preoperative MRI by examining the DCIS upstage rate in patients who were audited with MRI prior to surgery compared to those who were not.

Methods: In this retrospective analysis, our IRB-approved breast cancer database was queried for patients enrolled from 1/2010 to 10/2023 who had a biopsy-proven diagnosis of pure DCIS and underwent surgical treatment (mastectomy or breast conserving surgery). Variables of interest included preoperatively determined tumor size and grade, and postoperative classification of tumor type based on surgical pathology. Statistical analysis consisted of rate comparisons and the odds ratio for the association of preoperative MRI with upstage to invasive cancer. A subgroup analysis compared tumor size and grade between upstaged and non-upstaged cancers.

Results: Of 663 patients diagnosed with pure DCIS on biopsy, 152 (22.9%) were upstaged to invasive cancer. 447 (67.5%) patients had been evaluated with a preoperative MRI versus 216 (32.5%) whose workup excluded MRI. The rate of upstage to invasive disease was 23.7% (106/447) in those who were evaluated with MRI compared to 21.4% (46/216) in those who were not. There was no statistically significant association of preoperative MRI with upstage to invasive cancer (OR=1.14, 95% CI 0.77, 1.69, p=0.055). Subgroup analysis comparing DCIS that was upstaged to cases where the diagnosis did not change demonstrated that upstaged tumors were larger (2.85 cm (SD 1.79) vs 2.20 cm (SD 1.96), p 0.003) on preoperative radiographic imaging. There was also a statistically significant difference (p 0.021) in the proportion of tumor grades in these two groups; 0.7% of upstaged DCIS was grade I, 38.9% grade II and 60.4% grade III. 4.9% of non-upstaged DCIS was grade I, 43.8% grade II and 51.3% grade III.

Conclusions: Our study failed to show a benefit for preoperative MRI imaging in identifying cases of DCIS that were likely to be upstaged to invasive cancer at surgery. As expected, extent of disease and higher nuclear grade were factors associated with upstaging. While preoperative MRI may provide surgeons with good information regarding the volume of tissue necessary to constitute a successful lumpectomy for DCIS, the exam did not predict the presence of invasive disease. This information is valuable for surgeons, particularly as they consider whether or not to include sentinel node biopsy for patients undergoing mastectomy surgery for DCIS.

Table 1: DCIS upstaged vs. DCIS not upstaged at surgery

	Not Upstaged	Upstaged	P value
n	511	152	
MRI Yes (%)	341 (66.9)	106 (69.7)	0.572
DCIS Grade (%)			0.021
1	25 (4.9)	1 (0.7)	
2	223 (43.8)	58 (38.9)	
3	261 (51.3)	90 (60.4)	
Size (mean (SD))	2.20 (1.96)	2.85 (1.79)	0.003

1683653 - Radiologic Correlation with DCISionRT Risk Subtypes

Dylan Brokaw[1], Erica Giblin[1], Kristen Govert[1], Larry Stover[2]

[1]Ascension St. Vincent - Indianapolis, Indianapolis, IN, [2]Radiology Partners, Indianapolis, IN

Background/Objective: Underlying tumor characteristics play a role in the heterogeneous nature of ductal carcinoma in situ (DCIS) and the variable prognosis. DCISionRT is a genomic risk assessment tool that helps identify recurrence risk in patients with DCIS and those patients which would benefit from adjuvant radiation therapy. The aim of this study is to further investigate how radiologic calcification distributions correlate with DCISionRT risk subtypes, and gain a more thorough understanding of the disease process.

Methods: A retrospective analysis was performed on patients who underwent DCISionRT testing at Ascension St. Vincent hospitals in Indianapolis and Carmel Indiana. 73 patient's mammograms were reviewed by an experienced Radiologist to review radiologic classifications of DCIS. Lesions were characterized by distribution, morphology, size, grade, and DCISionRT score. ANOVA was used to evaluate significance of patient's age and tumor size with regard to risk subtype and Fisher's exact test with Freeman-Halton extension was used for radiologic distribution types and histologic grade.

Results: There was no statistical difference between radiologic distribution of calcifications and classification of DCISionRT risk subtype. Tumor size, histologic grade, and patient age were noted to correlate with different DCISionRT risk subtypes.

Conclusions: In our study, radiologic distribution did not correlate with DCISionRT risk subtypes. A larger tumor size, more advanced histologic grade, and advanced patient age correlated with DCISionRT subtypes of an elevated or residual risk. This study uses a genomic risk assessment tool as a surrogate for identifying lesions with a high recurrence risk. This offers an expedited method for determining possible clinical features that hold a prognostic value. The decision for adjuvant radiation therapy is complex and additional clinical and radiographic variables should be tested to identify which correlate with elevated risk subtypes and would be appropriate to be verified by longitudinal studies to better understand the pathophysiology of this disease process.

1675863 - Impact of Margin Width on Risk of Local Recurrence Following Breast-conserving Surgery for Pure Ductal Carcinoma In-Situ: A Systematic review and Meta-analysis

Dhurka Shanthakumar[1], Ahmed Ezzat[1], Naomi Laskar[1], Ramsey Cutress[2], Dimitri Hadjiminas[3], Michael Boland[1], Meera Joshi[1], Ronak Patel[1], Yasmin Grant[1], Ravi Naik[1], Nur A Che Bakri[1], Saur Hajev[4], Hussein Elghazaly[4], Josephine Holt[5], Ara Darzi[1], Hutan Ashrafian[1], Daniel Leff[1]

[1]Imperial College London, London, England, United Kingdom, [2]University of Southampton and University Hospital Southampton, Southampton, England, United Kingdom, [3]Imperial College Healthcare NHS Trust, London, England, United Kingdom, [4]Imperial College London NHS Trust, London, England, United Kingdom, [5]Royal Free London NHS Trust, London, England, United Kingdom

Background/Objective: Residual disease following breast conserving surgery (BCS) for ductal carcinoma in-situ (DCIS) is a strong predictor for local recurrence (LR). Despite the 2016 landmark paper by Marinovich et al, guideline recommendations on negative margin width vary internationally. The primary objective was to conduct an updated meta-analysis comparing risk for LR across different resection margin widths following BCS for pure DCIS.

Methods: This systematic review was registered on PROSPERO (CRD42022308524). An electronic search on Medline and Embase was performed using the search terms including “ductal”, “breast”, “carcinoma/tumour/neoplasm”, and “margin”. 2688 abstracts were screened. Inclusion criteria were a clear definition of margin width; a minimum of 48 months follow up; adjuvant whole breast radiotherapy; raw LR data available upon which to compute odds ratio (OR) and relative risk (RR). The proportion of patients within each margin width who received boost radiotherapy was also recorded. The analysis was adjusted for boost radiotherapy. Data was extracted for sociodemographics; cancer biology, histopathological assessment of margin width and adjuvant therapy.

Results: 26 studies were identified (LR= 1467 in 29,067 patients). OR and RR were calculated from raw data. Random-effects meta-regression was carried out to compare LR in specific margin width categories for three parameters; pooled odds ratio (OR), relative risk (RR) and hazards ratio (HR) respectively, as summarised in Table 1. The trend suggests that for each comparison of interest, wider margins are associated with significantly reduced LR risk, and the magnitude of risk reduction declines as margin width increases.

Conclusions: This meta-analysis demonstrates that across all margin widths under comparison, and across all risk description metrics that a narrower margin width is associated with an increased risk of LR. Whilst there was insufficient data to compare LR risk 1 vs 2mm, the magnitude of risk reduction (OR, RR) appeared to decrease as margin width increased.

Table 1. Pooled risk scores for ipsilateral locally recurrent breast cancer based on varying threshold of resection margin width (I2 = sample heterogeneity score, p = probability significance <0.05)

	Pooled OR (95% CI)	Pooled RR (95% CI)	Pooled HR (95% CI)
	20 studies; LR = 677 in 13,270 patients		11 studies; LR = 790 in 15,797 patients
Tumour on Ink vs No Tumour on Ink	2.690 (1.792 – 4.038) I^2 = 71%, p = 0.004	1.848 (1.444 – 2.252) I^2 = 67.9%, p = 0.008	2.218 (1.447 – 2.989) I^2 = 0%, p = 0.739
Tumour on Ink v >2mm	3.109 (2.158 – 4.478) I^2 = 69.2%, p = 0.003	2.208 (1.767 – 2.650) I^2 = 62.2%, p = 0.014	1.0 (0.986 – 1.014) I^2 = 0%, p = 0.683
0.1-1mm vs >1mm	2.768 (1.148 – 6.674) I^2 = 90.7%, p = 0.00	1.341 (0.943 – 1.738) I^2 = 67.5%, p = 0.026	1.412 (1.116 – 1.709) I^2 = 0%, p = 0.744
0.1–2mm vs >2mm	1.694 (1.281 – 2.238) I^2 = 63.1%, p = 0.004	1.295 (1.079 – 1.511) I^2 = 85.2%, p = 0.00	2.490 (2.4555 – 2.524) I^2 = 0%, p = 0.410

1683924 - Proportion of Patients with Ductal Carcinoma In Situ that Qualify for Observation

Callie McAdams[1], Kyra Nicholson[2], Nick Clevenger[3], Catherine Pesce[4], Katherine Kopkash[4], Elizabeth Poli[4], Thomas Smith[4], Katharine Yao[4]

[1]Northshore University Hospital System/University of Chicago, Evanston, IL, [2]University of Chicago, Chicago, IL, [3]Northshore University Health System, Chicago, IL, [4]Northshore University Health System, Evanston, IL

Background/Objective: Several ongoing clinical trials are investigating the role of active surveillance in low-risk ductal carcinoma in situ (DCIS) as an alternative to standard surgical excision, including the COMET (Comparison of Operative versus Monitoring and Endocrine Therapy), LORD (Management of Low-Risk (Grade I and II) DCIS), and LORIS (The Low Risk DCIS) trials. The objective of this study was to identify the proportion of patients that would be eligible for these trials amongst a cohort of DCIS patients treated at our institution over the past 10 years.

Methods: A retrospective chart review was performed of DCIS patients who were diagnosed and treated at our large academic hospital system from 2013-2022. The COMET, LORD, and LORIS trial inclusion and exclusion criteria were applied through chart abstraction to determine the proportion of patients eligible for each trial. These factors include patient age, presence of microinvasion, tumor characteristics, imaging factors and patient historical factors.

Results: 1223 patients were identified that had a core biopsy diagnosing DCIS with an average age of 61.7 years. After applying the inclusion and exclusion criteria of each study, there were 245 (20%), 238 (19.4%), and 264 (21.6%) patients eligible for the COMET, LORD, and LORIS trials respectively. While each trial has slightly different criteria, the criteria that had the largest impact on excluding patients was high grade DCIS (408, 408, and 576 for each trial respectively) and a mass on imaging (136, 133, 137 for each trial respectively). Sixty patients were excluded for the presence of microinvasion in all three studies. The majority of patients underwent partial mastectomy alone for surgical intervention. Six patients elected non-surgical treatment of their DCIS. Of the women that did undergo surgical treatment of the lesion the upgrade risk was 6.9% (N=17) for COMET, 6.7% (N=16) for LORD, and 6.4% (N=17) for LORIS. The mean size of tumor on final pathology for all trials was 1.75 cm.

Conclusions: Only one in five patients diagnosed with DCIS would qualify for observation according to trial eligibility. Future studies are needed to determine if these criteria can be expanded to include more DCIS patients.

1688402 - Is the Number or Proximity of Margins Less than 2 mm Associated with an Increased Mastectomy Rate in Patients Attempting Breast Conservation Therapy for Ductal Carcinoma in Situ?

Leslie Elmore[1], Erin Bayley[2], Beth Clark[3], Priscilla McAuliffe[2], Michael Cowher[2]

[1]University of Pittsburgh Medical Center, Department of Surgery, [2]Department of Surgery, Division of Breast Surgical Oncology, [3]Department of Pathology, Pittsburgh, PA, USA

Background/Objective: Consensus guidelines recommend ≥2mm margins in patients undergoing partial mastectomy (PM) for ductal carcinoma in situ (DCIS). It is unknown if the number or proximity of margins <2mm is associated with an increased mastectomy rate in patients attempting breast conservation therapy (BCT) for DCIS.

Methods: An institutional database query identified patients who underwent PM at a tertiary referral center and community hospitals from July 2020 to June 2023. Margins were defined as being either positive or close (<2mm), per current consensus guidelines. Patients with a history of breast cancer, previous surgery for breast cancer, ispalateral invasive carcinoma, papillary carcinoma, Paget's disease, more LCIS than DCIS present, initial mastectomy, routine shave margins (of all vectors), and ≥2mm margins of all six vectors were excluded. Selective intraoperative shave margins were included. Patients with two or more margins involved were classified as having adjacent (e.g. medial and superior), opposing (e.g. medial and lateral), or "cap" margins consisting of three or more adjacent margins.

Results: 208 patients who met inclusion criteria were retrospectively reviewed. 122 (59%) had one close/positive margin and 86 (41%) had two or more close/positive margins.

Of 122 patients who had one close/positive margin, 86 (71%) had a single PM specimen removed while 36 (30%) had an additional selective margin at initial surgery. Additionally, 59 (48%) patients had no further surgery, 6 (5%) proceeded directly to mastectomy, and 57 (47%) underwent re-excision. Of patients without re-excision, 30 (51%) had <2mm margins of either the posterior or anterior margin. Of patients who underwent re-excision, 3 patients eventually underwent mastectomy. Overall mastectomy rate was 7% (9/122).

Of 86 patients who had two or more close/positive margins, 22 (26%) had no further surgery, 13 (15%) proceeded directly to mastectomy, and 51 (59%) underwent re-excision. Of patients without re-excision, 12 (73%) involved the anterior or posterior margin and 12 (77%) had adjacent margins, 5 (23%) had cap margins and no patients had opposing margins. Of the patients who underwent re-excision, 42 (82%) had clear margins. Of the 9 remaining patients with margins not cleared by re-excision, 4 underwent mastectomy and 5 underwent a second re-excision. Overall mastectomy rate was 20% (17/86). Those with two or more close/positive margins had a mastectomy rate that was increased threefold compared to those with one close/positive margin. (p=0.0103).

Of 86 patients who had two or more close/positive margins, 43 (50%) had adjacent margins, 38 (44%) had "cap" margins, and 5 (6%) had opposing margins. Of those, 6 (14%) with adjacent margins, 11 (29%) with "cap" margins and 0 with opposing margins underwent mastectomy. (p=0.0082). Mastectomy rates are summarized in Table 1.

Conclusions: Patients undergoing PM for DCIS had a completion mastectomy rate that increased threefold if they had two or more close/positive margins at initial PM, compared to those with one close/positive margin at initial PM. Those with close/positive "cap" margins had an increased mastectomy rate compared to those with adjacent or opposing margins.

Table 1: Demonstrates the number of patients proceeding directly to mastectomy after index procedure or after re-excision attempts with one close/positive margin and two close/positive margins. Of those with two close/positive margins, it is noted if the margins were adjacent, "cap", or opposing.

	Number of Patients	Mastectomy Rate
One Close/Positive Margin (122)		
Direct to Mastectomy	6/122	4.9%
After One Re-excision	2/57	3.5%
After Two Re-excisions	1/3	33.3%
Two Close/Positive Margins (86)		
Direct to Mastectomy	13/86	15.1%
Adjacent Margins	4/13	30.8%
Cap Margins	9/13	69.2%
Opposing Margins	0/13	0.0%
After one Re-excision	4/51	7.8%
Adjacent Margins	2/4	50.0%
Cap Margins	2/4	50.0%
Opposing Margins	0/4	0.0%
After two Re-excisions	0/5	0.0%
Adjacent Margins	0/1	0.0%
Cap Margins	0/2	0.0%
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1681317 - The Effect of Body Mass Index on Breast Cancer Stage and Breast Cancer-specific Survival: A California Cancer Registry Study

Alyssa Bellini[1], Theresa Keegan[2], Qian Li[3], Frances Maguire[4], Victoria Lyo[5], Candice Sauder[2]

[1]University of California Davis School of Medicine, Sacramento, CA, [2]Comprehensive Cancer Center, University of California Davis, Sacramento CA, [3]Center for Oncology Hematology Outcomes Research and Training (COHORT) and Division of Hematology and Oncology, University of California Davis School of Medicine, Sacramento, CA, [4]California Cancer Reporting and Epidemiologic Surveillance Program, University of California Davis Comprehensive Cancer Center, Sacramento, CA, [5]Center for Alimentary and Metabolic Science, University of California Davis School of Medicine, Sacramento, CA

Background/Objective: While women with a body mass index (BMI) > 30 kg/m2 or < 18.5 kg/m2 diagnosed with breast cancer (BC) are known to have decreased overall survival, the exact mechanisms are unknown as prior studies evaluating the association between BMI and BC stage were done more than a decade ago and have conflicting results. We aim to further define the relationship between BMI, stage at breast cancer diagnosis, and BC specific survival.

Methods: Women age >15 years diagnosed with BC between 2014-2019 were identified from the California Cancer Registry. BMI at diagnosis was classified as underweight (< 18.5 kg/m2), normal weight (18.5-24.9 kg/m2), overweight (25-29.9 kg/m2), obesity class 1-2 (30-39.9 kg/m2), obesity class (severe obesity) 3 (>40 kg/m2) and missing. Late stage at diagnosis was defined as American Joint Committee on Cancer (AJCC) stage 3 and 4 BC. Multivariate logistic regression was performed to compare sociodemographic and clinical factors such as age, AJCC stage and treatment associated with missing BMI data and late stage at diagnosis. Multivariable Cox proportional hazards regression models assessed the associations of BMI with BC specific survival, while controlling for sociodemographic and clinical factors; deaths from other causes were considered as competing risks.

Results: Of 159,318 patients, 63.5% had complete BMI data: 1.3% were categorized as underweight, 22.1% normal weight, 19.4% overweight, 16.9% obesity class 1-2, and 3.7% obesity class 3. Patients with missing BMI data were more likely to be non-Hispanic white (47.3%), >51 years old (76.1%) and have private insurance (56%). Of the patients with BMI data, compared to normal weight, only severe obesity was associated with later stage of BC diagnosis ($p< 0.0001$). Underweight compared to normal weight patients had a higher risk of BC specific death [Hazard Ratio (HR) 1.4, 95% Confidence Interval (CI) 1.2-1.6] after adjusting for known prognostic factors. Patients who were overweight or obese class 1-2 had a lower risk of BC specific death [HR 0.9, CI 0.8-0.9]. Missing BMI compared to normal weight was not associated with later stage at diagnosis or BC specific survival; however, due to the high amount of missing BMI data, we will verify these results with multiple imputation methods.

Conclusions: Using population-based data, we observed that severe obesity was associated with a later stage at diagnosis, but not inferior BC survival, as found previously. Instead, underweight was associated with worse survival and indicate a high-risk group. Our findings are limited by the large proportion of missing BMI data highlighting the need to verify these findings with multiple imputation methods and improve BMI reporting to the cancer registry.

1690209 - Disparities in Omission of Surgery in Older Women with High-Risk Breast Cancer

Eliza Lorentzen[1], Annabelle Jones[1], Olga Kantor[1], Tari King[2], Elizabeth Mittendorf[1], Christina Minami[1]

[1]Department of Surgery, Brigham and Women's Hospital, Boston, MA, [2]Department of Sugery, Brigham and Women's Hospital, Boston, MA

Background/Objective: While randomized controlled trial data support de-escalation of locoregional therapy in select older patients with low-risk breast cancer (early-stage, hormone-receptor positive [HR+] disease) without decrement in survival, similar high-quality data in adults with high-risk breast cancer (stage II-III, HER2-positive [HER2+] or triple-negative breast cancer [TNBC]) does not exist. As surgery is a mainstay of therapy in these patients, we sought to quantify the incidence of, and factors associated with, omission of surgery in older patients with Stage II or III HER2+ or TNBC.

Methods: Women ≥ 70 years of age diagnosed with stage II-III HER2+ or TNBC between 2010-2020 were identified in the National Cancer Database (NCDB). A multivariable logistic regression model was performed to determine patient, disease, and treatment-related factors associated with omission of surgery. Reasons for omission of surgery as reported by the NCDB were also explored.

Results: A total of 33,882 patients were identified; median patient age was 77 years (range 70-90). Overall, 4,004 (11.8%) patients did not undergo surgery. Of these, 1,485 (37.1%) and 429 (10.7%) patients received chemotherapy and radiation therapy, respectively. A greater proportion of patients ≥ 85 years old (1,485 [23.5%]) had surgery omitted compared to patients 70-74 years (925 [7.3%]). Similarly, a greater proportion of Black patients (835 [16.4%]) had surgery omitted compared to Non-Hispanic Whites (2,734 [10.8%]) ($p< 0.001$). On multivariable analysis, older age, being of Black race (compared to Non-Hispanic White race), having non-private insurance status, lower income, being treated at an academic center (compared to a community cancer program), having a Charlson Comorbidity Index (CCI) ≥ 3 (compared to CCI=0), lower tumor grade, having HER2+ disease, stage III disease, and omission of chemotherapy were significantly associated with a higher likelihood of surgical omission [Table]. In the majority of cases, the reported reason for omission of surgery was that it was not a part of planned treatment (2,379 [59.4%]). Other reasons included that the patient refused (752 [18.8%]), that treatment was withheld due to patient risk factors (613 [15.3%]), the patient died (193 [4.8%]), or it was not performed despite recommendation (67 [1.7%]).

Conclusions: Although the majority of older women with stage II-III HER2+ disease or TNBC underwent surgery, a small proportion had surgery omitted despite lack of high-quality evidence supporting non-operative approaches. While some operative decisions may be influenced by disease- or treatment-related factors, including stage, tumor subtype, and systemic therapy options, the significant association between socioeconomic and racial and ethnic factors suggest that some vulnerable women with high-risk disease may be potentially undertreated. Future work is warranted in this population to further define how the interplay of patient-, disease-, and treatment-related factors may lead to potentially inappropriate oncologic care.

Table: Multivariable Logistic Regression Model for Factors Associated with Omission of Surgery		
	OR [95% CI]	**P-Value**
Age		
70-74	REF	
75-79	1.13 (1.01-1.26)	**0.030**
80-84	1.43 (1.28-1.60)	**<0.001**
≥85	2.57 (2.3-2.86)	**<0.001**
Charlson Comorbidity Index		
0	REF	
1	0.81 (0.73-0.89)	**0.000**
2	1.08 (0.93-1.25)	0.323
≥3	1.34 (1.13-1.58)	**0.001**
Race/Ethnicity		
Non-Hispanic White	REF	
Black	1.68 (1.52-1.85)	**<0.001**
Hispanic White	1.06 (0.90-1.24)	0.478
Asian/Pacific Islander	1.12 (0.90-1.37)	0.292
Other/unknown	1.73 (1.31-2.26)	**<0.001**
Insurance Status		
Private	REF	
Medicaid/Medicare	1.27 (1.11-1.45)	**0.001**
Uninsured	2.21 (1.39-3.40)	**0.000**
Other/Unknown	1.56 (1.12-2.14)	**0.007**
Income		
< 40.000 USD	REF	
≥ 40.000 USD	0.89 (0.81-0.98)	**0.014**
Facility Type		
Community Cancer Program	REF	
Comprehensive Community Cancer Program	0.95 (0.83-1.09)	0.444
Academic Program	1.25 (1.09-1.44)	**0.002**
Integrated Network Cancer Program	0.94 (0.81-1.09)	0.386
Tumor Grade		
1	REF	
2	0.90 (0.73-1.13)	0.373
3	0.66 (0.53-0.82)	**<0.001**
Unknown	1.60 (1.25-2.05)	**<0.001**
Tumor Subtype		
TNBC	REF	
HR+/HER2+	1.55 (1.42-1.69)	**<0.001**
HR-/HER2+	1.41 (1.27-1.56)	**<0.001**
Stage		
II	REF	
III	3.45 (3.19-3.73)	**<0.001**
Chemotherapy		
Did not receive	REF	
Received	0.48 (0.44-0.52)	**<0.001**
Unknown	0.77 (0.57-1.02)	0.079

1686972 - Influence of Arm Morbidity on Financial Difficulty in Breast Cancer Survivors

Sara Myers[1], Alison Laws[2], Laura Dominici[3], Mirelle Lagendijk[4], Samantha Grossmith[5], Elizabeth Mittendorf[6], Tari King[6]

[1]Brigham and Women's Hospital, Dana Farber Cancer Institute, West Roxbury, MA, [2]University of Calgary, Calgary, AB, Canada, [3]Brigham and Women's Hospital, Boston, MA, [4]Erasmus MC, Rotterdam, Noord-Holland, Netherlands, [5]Massachusetts General Hospital, Boston, MA, [6]Department of Surgery, Brigham and Women's Hospital, Boston, MA

Background/Objective: The degree to which long-term upper extremity symptoms after breast cancer treatment impact patient-reported financial difficulty is unknown. In this cross-sectional investigation, we hypothesize that severity of arm symptoms is associated with greater financial difficulty as a preliminary step in ascertaining whether interventions directed at treatment-related complications might alleviate cancer-related financial burden.

Methods: Patients with stage 0-III breast cancer treated at our NCI-designated cancer center between 2002-2012 were recruited to participate in a 2018 survey study appraising quality of life. A linear transformation was applied to 4-point Likert-scale responses (1=Not at all; 4= Very much) to items assessing arm morbidity from the EORTC-QLQ-BR23 questionnaire and financial difficulty from the EORTC-QLQ-C30 questionnaire. This yielded Arm Symptom (AS) and Financial Impact (FI) scores ranging from 0-100, with higher scores reflecting increasing severity. Linear regression evaluated the relationship between AS and FI scores adjusting for clinically relevant variables.

Results: Of the 1,126 patients who expressed interest in participating, 882 (78%) responded to the surveys. 568 (64%) had sufficiently complete data for inclusion in this analysis. The majority of patients presented with clinical stage I disease (326 (57%)). Median time since surgery was 9 years. 270 (48%) patients underwent breast conserving therapy (BCT) compared to 117 (21%) and 181 (32%) who received mastectomy alone and with reconstruction, respectively. Sentinel lymph node biopsy was the dominant strategy for axillary management (334 (58.9%)); 221 (39%) underwent axillary lymph node dissection. Neoadjuvant chemotherapy was administered to 105 (19%) of patients. 126 (22%) patients received postmastectomy radiation (PMRT). Of the 217 (38%) patients who experienced arm symptoms, 94 (43%) endorsed 1 mild symptom, 54 (25%) had 2 or more mild symptoms, and 60 (28%) had at least 1 severe symptom. While 492 (87%) of the participants denied any financial difficulty as a result of their breast cancer treatment, 44 (8%) endorsed experiencing “a little” difficulty, 22 (4%) faced “quite a bit” of difficulty, and 10 (2%) reported “very much” difficulty. Although 3 of the 10 patients with the highest degree of financial difficulty had no arm symptoms, for the remaining 7, symptoms were severe. On univariate analysis, younger age at surgery ($p=.029$), mastectomy with reconstruction ($p=0.003$), Hispanic ethnicity ($p< 0.001$), PMRT ($p=0.027$), any recurrence ($p< 0.001$), and higher AS score ($p< 0.001$) were associated with greater degree of financial difficulties. On multivariable analysis adjusting for these factors, AS score, younger age at surgery, Hispanic ethnicity, and recurrence all remained significantly associated with increasing financial difficulty (Table 1).

Conclusions: Our findings suggest that younger age, Hispanic ethnicity, and arm morbidity are associated with increased risk for financial toxicity. These observations are particularly compelling considering financial hardship may have been underestimated in this study of insured patients from a single NCCN-designated cancer center surveyed years after incurring treatment-related expense. Further investigations that clarify how treatment-related adverse events such as arm morbidity may increase vulnerability to financial hardship can guide early and effective interventions to mitigate this burden.

Table 1. Multivariable regression analysis examining factors associated with financial difficulties after breast cancer treatment

Variable	Coefficient	95% CI	p
Arm Symptom Score	0.39	0.25-0.54	<0.001
Age at surgery	-0.17	-0.33, -0.01	0.034
Surgery type			
Mastectomy alone	-0.26	-9.22, 8.70	0.954
Mastectomy with reconstruction	2.87	-5.84, 11.58	0.518
BCT	Ref	Ref	Ref
Hispanic Ethnicity	18.98	6.01, 31.94	0.004
Radiation			
Post-BCT	-0.20	-8.50, 8.09	0.961
PMRT	2.05	-2.33, 6.44	0.358
None	Ref	Ref	Ref
Recurrence	11.55	5.75, 17.34	<0.001

Abbreviations: BCT: Breast Conserving Therapy; PMRT: Post-mastectomy radiation therapy; CI: Confidence Interval

1687215 - Breast Reconstruction After Medicaid Expansion: Who Gets What? A Difference-in-Difference Analysis

Sophie Chung, Sarah Schroter, Kelsey Romatoski, Anna Kobzeva-Herzog, Kelly Kenzik, Andrea Merrill, Jennifer Tseng, Teviah Sachs, Michael Cassidy

Boston University Chobanian and Avedisian School of Medicine, Boston Medical Center, Boston, MA

Background/Objective: Autologous breast reconstruction (AR) after mastectomy has been shown to offer psychosocial benefits for patients, but is more complex and costly than implant-based reconstruction (IBR) and associated with higher rates of perioperative complications. While previous studies have shown that rates of post-mastectomy reconstruction (PMR) increased in states with Medicaid expansion, no evidence is available on the use of on AR versus IBR in expansion vs. non-expansion states. Thus, we sought to assess the association of insurance status with AR and IBR after mastectomy during the era of Medicaid Expansion.

Methods: Female patients >39 years of age with breast cancer who underwent mastectomy with IBR or AR were identified from the National Cancer Database (2010-2017). Potential access to insurance was captured via Medicaid expansion state status. States were divided into those that expanded Medicaid at any point in time and those that did not. First, multivariate regression was used to assess odds ratios for AR versus IBR. Second, Difference-in-Difference (D-i-D) analysis at the facility level evaluated rates of IBR versus AR between expansion and non-expansion states.

Results: Of 93,063 patients who underwent mastectomy (43.4% AR; 56.6% IBR), 62.0% were in expansion states while 38.0% were in non-expansion states. Rates of uninsured status remained unchanged in non-expansion states (1.8%-1.7%; p=0.92) but decreased by nearly half in expansion states (1.1%-0.6%; p< 0.0001). Rates of Medicaid insurance increased in expansion states (5.7%-6.7%; p< 0.0001) and decreased in non-expansion states (4.2%-3.9%; p< 0.0001). AR decreased in both expansion states (44.5%-40.2%, p< 0.0001) and non-expansion states (46.1%-44.9%; p=0.0012). In both non-expansion and expansion states, more Black patients underwent AR before and after Medicaid expansion compared to White patients (pre-expansion 56.0% vs 43.9%; post-expansion 51.4% vs 40.8%, p< 0.0001). Multivariate analysis demonstrated that treatment prior to 2014 (OR 1.14, [1.11-1.17], p< 0.0001), Black race (1.56, [1.49-1.63], p< 0.0001), and other non-White race (1.13, [1.06-1.20], p< 0.0001), were associated with increased odds of AR. Treatment in expansion states (OR 0.89, [0.86-0.91], p< 0.0001), was associated with decreased odds of AR. Medicaid (OR 0.98, [0.86-1.12], p=0.8021) and Medicare/private/other government insurance (OR 0.99, [0.88-1.12], p=0.9231) versus uninsured status were not associated with increased or decreased odds of AR. D-i-D analysis did not show significant differences in distribution of AR versus IBR before and after Medicaid expansion (p=0.0522), although total numbers of reconstruction rates varied by insurance type and changed over time.

Conclusions: Increased potential access to insurance via Medicaid expansion was associated with an overall decrease in AR and an increase in IBR. Significant changes in proportions of AR versus IBR before and after Medicaid expansion were not seen in D-i-D analysis. However, multivariate analysis demonstrated that non-white patients and patients in expansion states had higher odds of undergoing AR, consistent with previous literature. These results may be delimited by the relatively small numbers of patients who gained insurance access after Medicaid expansion. We hope to build on these data to identify barriers to AR for Medicaid patients in all states in order to increase opportunity and utilization.

Table 1: Patient demographics (A; n, %) and difference-in-difference analysis

	2010-2013 (Pre-Expansion)			2014-2017 (Post-Expansion)		
	Autologous Reconstruction (AR)	**Implant Based Reconstruction (IBR)**	**P-value**	**Autologous Reconstruction (AR)**	**Implant Based Reconstruction (IBR)**	**P-value**
Total	19,560 (45.0%)	23,859 (55.0%)		20,848 (42.0%)	28,796 (58.0%)	
Age, Median (IQR)	53 (47,60)	53 (47,61)	<0.0001	53 (47,61)	53 (47,61)	<0.0001
Race						
White	16,577 (43.9%)	21,228 (56.1%)	<0.0001	17,176 (40.8%)	24,890 (59.2%)	<0.0001
Black	2,140 (56.0%)	1,685 (44.0%)		2,527 (51.4%)	2,385 (48.6%)	
Other	843 (47.1%)	946 (52.9%)		1,145 (43.0%)	1,521 (57.0%)	
Insurance			0.4257			0.7636
Medicaid	1,027 (45.8%)	1,214 (54.2%)		1,184 (42.5%)	1,599 (57.5%)	
Other Insurance	18,263 (45.0%)	22,343 (55.0%)		19,439 (42.0%)	26,897 (58.0%)	
Uninsured	270 (47.2%)	302 (52.8%)		225 (42.9%)	300 (57.1%)	
Expansion Status			0.0012			<0.0001
Expansion State	12,128 (44.5%)	15,154 (55.5%)		12,221 (40.2%)	18,207 (59.8%)	
Non-Expansion State	7,432 (46.1%)	8,705 (53.9%)		8,627 (44.9%)	10,589 (55.1%)	
Difference-in-Difference						0.0522
Autologous (AR)	48.2%	45.4%		47.5%	40.8%	
Implant Based (IBR)	51.8%	54.6%		52.5%	59.3%	

1683898 - Strengthening Nursing Capacity in Comprehensive Oncology Care in Africa: Results of a Pilot Training Program in Hawassa, Ethiopia

Bedilu Deribe[1], Linda Setiawan[2], Netsnet Bogale[3], Betty Ferrell[4], Lesley Taylor[5]

[1]Hawassa University College of Medicine and Health Sciences, Duarte, CA, [2]BIO Ventures for Global Health, Seatle, WA, [3]Hawassa University Comprehensive Specialized Hospital Cancer Treatment Center, Duarte, CA, [4]City of Hope National Cancer Center, Duarte, CA, [5]City of Hope National Medical Center, Burbank CA

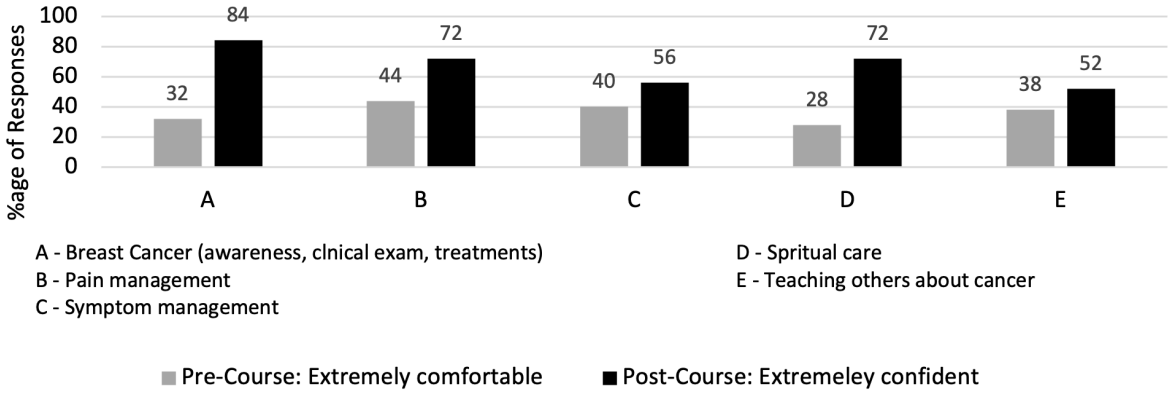
Background/Objective: There is a limited workforce specialized in oncology in isolated and rural regions of Africa were breast cancer (BC) morbidity and mortality are high. In addition to the shortage of specialists, nurses as providers and educators often lack sufficient knowledge, skills, and confidence in topics relevant to comprehensive cancer care. Therefore, we aimed to improve the regional capacity of nurses in oncology care through piloting an educational program in southern Ethiopia.

Methods: To select and identify areas of knowledge gaps and relevant content for comprehensive oncology care in the local setting, a human centered design was used for implementation. Learning materials were developed and presented for review by experts to establish validity. The program used lectures supported by videos, small-group case discussions, skill-based lab demonstrations, and a clinical site visit. The 4-day course was attended by 30 nurses at Hawassa University Comprehensive Specialized Hospital (HUCSH) in Hawassa City, Ethiopia. Pre- and post-course knowledge assessments were performed. Twenty five nurses completed demographic, pre-course, and 6-month follow up surveys with 5-point Likert scale questions and free text responses. Descriptive results were analyzed using SPSS software. A paired t-test was used to assess knowledge change.

Results: Of the 25 participants, 15 were male and 10 (40%) were female. The median age was 33 (range 26-58). The median work experience in nursing was 10 years, (range 4 to 30); and in oncology was 2 years, (range 0 to 8). The mean percentage of time working with cancer patients was 62%. Twenty eight percent had a diploma in nursing; 60% a BSc degree; 12% a Master's degree; and 8% other additional training. Among the 22 who completed the knowledge assessment, pre-and post-test scores increased from 50 to 76%, which was statistically significant ($p < 0.001$). Before the course, 20-36% were not at all or somewhat comfortable in communicating with patients about cancer diagnosis and treatments; pain management; symptom management; spiritual care; teaching others about cancer; and BC awareness, clinical exam and treatments. After 6 months, over 95% reported they felt very or extremely confident in these topics. The majority strongly agreed they felt better able to perform clinical breast examinations (N = 15, 60%); better equipped to work with other providers in the treatment of cancer (N=19, 75%); and better able to talk to patients of different religious backgrounds about cancer treatments (N= 13, 52%). Notably, 84% felt extremely confident in their understanding of BC awareness, clinical exam and treatments. However, 32% strongly agreed they felt better able to provide palliative care and 20% strongly agreed they knew what steps to take when a patient is suspected to have cancer.

Conclusions: This short-term oncology training program for nurses in Ethiopia addressed barriers to providing comprehensive care by increasing knowledge, skills, and confidence in locally relevant topics. Identified areas of less confidence will be further developed. The multi-modality, interactive course leveraged local resources and faculty expertise, social context, and case scenarios to build foundational knowledge and practical skills that could be scaled up regionally to sustainably strengthen the workforce.

Figure 1: Perceptions of nurses before and 6 months after the course



A - Breast Cancer (awareness, clnical exam, treatments)
B - Pain management
C - Symptom management
D - Spritual care
E - Teaching others about cancer

Pre-Course: Extremely comfortable
Post-Course: Extremeley confident

1688519 - Sociodemographic Disparities within Pediatric Breast Cancer

Cara Berkowitz[1], Stephany Perez-Rojas[2], Kriyana Reddy[2], Sarah Hulse[2], Kathleen Jarrell[2], Joy Collins[3], Leisha C. Elmore[4], Rebecca Fishman[2], Alina Mateo[2], Ashley Newman[2], Jami Rothman[2], Dahlia Sataloff[2], Julia Tchou[2], Jennifer Zhang[4], Anne McCarthy[2], Oluwadamilola M. Fayanju[4]

[1]The University of Pennsylvania, Children's Hospital of Philadelphia, Philadelphia, PA, [2]The University of Pennsylvania, Philadelphia, PA, [3]Children's Hospital of Philadelphia, Philadelphia, PA, [4]Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA

Background/Objective: Sociodemographic status plays a critical role in pediatric breast cancer. Examining race and ethnic differences is crucial to recognizing and addressing disparities in clinical care, including variations in presentation and diagnosis, tumor demographics, response to treatment, and clinical outcomes. By identifying these differences, we can develop individualized approaches to care and improve prognosis and outcomes for patients from diverse backgrounds.

Methods: We obtained data from the National Cancer Data Base for patients < 17 diagnosed between 2004-2020 with breast cancer. Items were recoded to account for year of diagnosis. Race and ethnicity were combined into one variable and recoded as NH Black, NH White, Hispanic, and other. Insurance status was recoded as private, government, not insured, and unknown. Charlson Comorbidity Score was recoded into score 0, score 1, score 2, and score greater than 3. Grade was recoded into low grade, high grade, and unknown. Histology was recoded into carcinoma, malignant phyllodes tumor, sarcoma, and other. p-values were derived using a chi-square test. All analyses were conducted using SAS version 9.4 and R version 4.2.2.

Results: There were 122 pediatric breast cancer patients who met inclusion criteria. 94.3% of patients were female and the median age of diagnosis was 16 years. The majority of cases occurred in NH White patients (49.2%), followed by NH Black (21.3%), Hispanic (17.2%), and other (12.3%) (Table 1). NH White patients were more likely to have private insurance compared to NH Black and Hispanic patients (p=0.005), whereas government insurance was more common among NH Black and Hispanic patients (p=0.005). A greater proportion of NH Black and Hispanic patients reported household median incomes <$40,227 compared to NH White patients (p=0.108). NH White patients had a greater proportion of Charlson Comorbidity Scores of 0, indicating no comorbidities, compared to NH Black and Hispanic patients (p< 0.05). The most common histologic subtypes varied among the different racial and ethnic groups with carcinoma most prevalent among NH White patients, malignant phyllodes tumor among NH Black, and sarcoma among Hispanic patients (p< 0.05). High grade tumors were more common in NH Black and Hispanic patients compared to NH White patients (p=0.123). While surgery was performed in the majority of cases, there was a lower proportion performed in Hispanic patients (p=0.482). Death was relatively low across groups, with a higher death rate in Hispanic patients (14.3%) compared to NH White (8.3%) and NH Black (7.7%) patients (p=0.819).

Conclusions: This study highlights the importance of examining sociodemographic differences within the pediatric breast cancer population, with notable variations seen in socioeconomic status, patient comorbidities, tumor demographics, and outcomes among diverse race and ethnic groups. Further exploration is warranted to advance our understanding of how to address these differences effectively, ensuring the best possible care for all patients.

Table 1.

Parameters	NH White (n=60)	NH Black (n=26)	Hispanic (n=21)	Other (n=15)	Total (n=122)	p-value
Insurance Type %						
Private	81.7	50.0	38.1	53.3	63.9	0.005
Government	16.7	50.0	42.9	33.3	30.3	
Not Insured	1.7	0.0	4.8	0.0	1.6	
Missing	0.0	0.0	14.3	13.3	4.1	
Household Median Income %						
<$40,227	15.0	30.8	19.0	20.0	19.7	0.108
$40,227 - $50,353	23.3	34.6	9.5	20.0	23.0	
$50,354 - $63,332	18.3	7.7	47.6	13.3	20.5	
≥$63,333	31.7	19.2	23.8	20.0	26.2	
Unknown	11.7	7.7	0.0	26.7	10.7	
Charlson Comorbidity Score %						
0	100	92.3	81.0	93.3	94.3	0.030
1	0.0	7.7	19.0	6.7	5.7	
Histologic Subtype %						
Carcinoma	46.7	34.6	23.8	26.7	37.7	0.034
Malignant phyllodes tumor	28.3	53.8	19.0	46.7	34.4	
Sarcoma	20.0	11.5	47.6	20.0	23.0	
Other	5.0	0.0	9.5	6.7	4.9	
Grade %						
High	55.0	69.2	71.4	46.7	59.8	0.123
Low	33.3	23.1	14.3	13.3	25.4	
Unknown	11.7	7.7	14.3	40.0	14.8	
Surgery %						
Performed	90.0	92.3	71.4	86.7	86.9	0.482
Not Performed	8.3	7.7	28.6	13.3	12.3	
Unknown	1.7	0.0	0.0	0.0	0.8	
Death %						
No	91.7	88.5	81.0	80.0	87.7	0.819
Yes	8.3	7.7	14.3	13.3	9.8	
Missing Vital Status	0.0	3.8	4.8	6.7	2.5	

1688232 - Disaggregation of Asian American Pacific Islander Data Reveals Heterogeneous Outcomes After Neoadjuvant Chemotherapy for Invasive Breast Cancer

Sarah Yuen, Avneet Bhullar, Kari Kansal, Karen Lane, Erin Lin, Holly Yong

University of California Irvine, Orange, CA

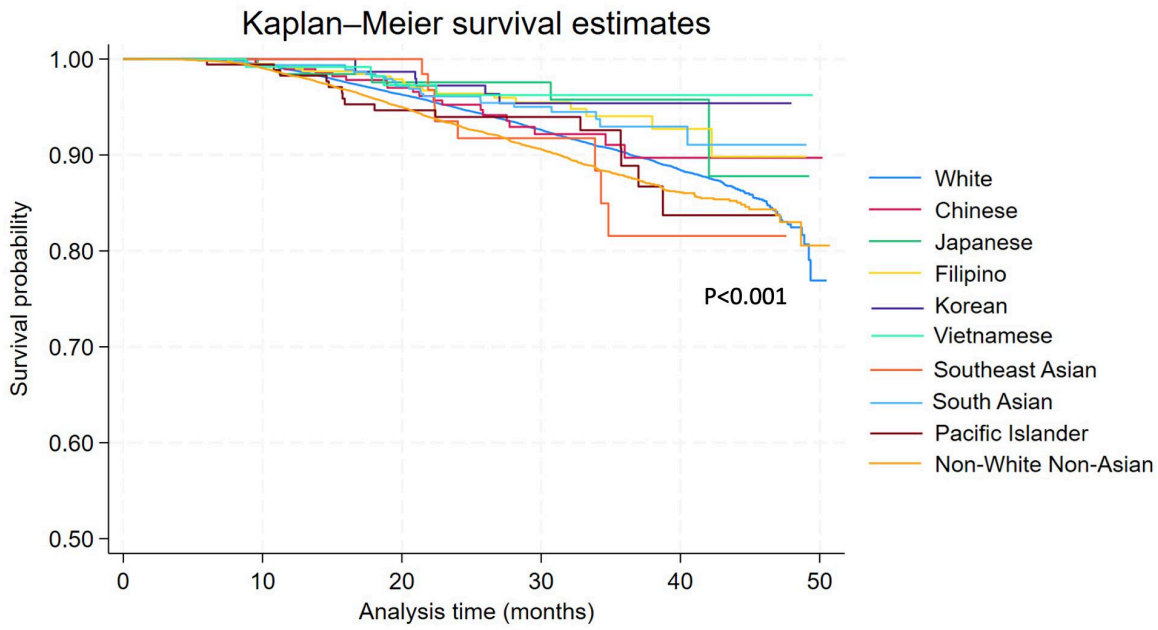
Background/Objective: Breast cancer literature has traditionally evaluated the Asian American Pacific Islander (AAPI) population as one aggregate, however recent literature has highlighted the cultural, socioeconomic, and biological heterogeneity of these groups. This study evaluates the outcomes of disaggregated AAPI ethnic subgroups undergoing neoadjuvant chemotherapy and surgical excision of invasive breast cancer (IBC) to identify and address potential disparities within the AAPI population.

Methods: The National Cancer Database was queried from 2018-2020 to identify female patients with IBC who received neoadjuvant chemotherapy followed by surgical excision. Patients were stratified by race, comparing White, AAPI, and Non-White Non-Asian (NWNA) patients, followed by further comparison amongst AAPI subgroups. Demographics, tumor characteristics, and treatment types were evaluated. The primary outcome was pathologic complete response (PCR). Kaplan Meier method was used to estimate median overall survival (OS).

Results: A total of 82,763 women met inclusion criteria. Of these, 76.8% were White, 3.5% were AAPI and 19.7% were NWNA. Compared to White and NWNA, AAPI had the highest PCR (AAPI 22.2% vs NWNA 21.2% vs White 20.2%, $p< 0.001$) and lowest 90-day mortality (0.2% vs 0.7% vs 0.4%, $p< 0.001$). However, on further analysis of AAPI subgroups, there was significant heterogeneity. While all other AAPI subgroups had higher PCR than White and NWNA, Filipino and Pacific Islanders (PI) had the lowest PCR amongst all breast cancer subtypes (Filipino 18.8% and PI 18.8%, $p< 0.001$). Among patients with HER2+ disease, Filipino and PI also had the poorest PCR (Filipino 37.3% vs PI 35.6%, $p< 0.001$). Filipino were least likely to undergo partial mastectomy and most likely to undergo simple or modified radical mastectomy compared to all other subgroups ($p< 0.001$). PI were most likely to have additional comorbidities and present with lymphovascular invasion. Meanwhile, Southeast (SE) Asians were most likely to have triple negative disease among AAPI (30.0%, $p< 0.001$) and had the lowest PCR among triple negative patients (24.2%, $p=0.001$). SE Asians were also most likely to be uninsured, in the lowest income and education quartile, and present with distant disease (all $p< 0.001$). PI and SE Asians had the lowest OS, while Filipino OS was comparable to other subgroups (Filipino 47.1 months vs SE Asian 44.2 vs PI 44.1, $p< 0.001$).

Conclusions: AAPI subpopulations are heterogeneous and aggregate analysis masks cancer disparities amongst them. While aggregate analysis of AAPI demonstrates higher PCR and lower mortality compared to White and NWNA patients, disaggregation of AAPI subgroups reveals decreased PCR and OS for some subset of AAPI in the setting of higher comorbidity rates, lower socioeconomic status, and more advanced presentation of disease. The disparity amongst AAPI, and Filipino, PI, and SE Asians in particular, emphasizes the combined contributions of tumor biology, cultural and socioeconomic factors to cancer outcomes, and need for targeted interventions to address disparities among unique ethnic subpopulations.

Figure 1: Kaplan-Meier survival curves stratified by racial subgroups



1688311 - Are There Differences in Survivorship Program Participation Among Breast Cancer Patients Based on Race or Age?

Lisa Anderson[1], Oindrila Bhattacharyya[2], Akia Clark[1], Michael Grimm[3], Annie Trance[1], Bridget Oppong[1]

[1]The Ohio State University, Columbus, OH, [2]The Ohio State University Comprehensive Cancer Center, Columbus, OH, [3]West Virginia University College of Medicine, Morgantown, WV

Background/Objective: With advancements across all treatment modalities, breast cancer survivorship has increased resulting in 3.8 million survivors in the US. These women have various supportive care needs that can be addressed through Survivorship Programs (SPs). SPs offer clinical and non-clinical support services for a more holistic approach in the comprehensive treatment of breast cancer and prevention of recurrence. Historically there are disparities in SP utilization among minority and elderly women. We sought to identify differences in participation in these supportive services according to age and race within a single institution.

Methods: This study is a retrospective analysis of diverse breast cancer patients' survivorship needs and preferences at the James Comprehensive Cancer Center. We abstracted the demographic information of participants who attended the James Care for Life programs from January 2019 through December 2022. We assessed the numbers of patients given referrals to individualized clinical resources including Adolescent/young adult care, Fertility preservation, Palliative care, Psychosocial support, and Survivorship. Survivorship is a provider-initiated visit for non-metastatic patients post-treatment and includes a treatment summary, holistic needs assessment and healthy lifestyle counseling. Participation in non-clinical program areas included Art, Education, Exercise, Family, Teens, Children, Mind, Body, Spirit, Music, Nutrition, and Young Adult Survivors (ages 18-39). Descriptive statistics were utilized to summarize patterns based on age, race and ethnicity observed within our institution. Given small samples, race categories are grouped into non-Hispanic White, Black and other.

Results: From 2019-2022, 2198 breast cancer participants attended SPs. The most attended SPs during this period were nutrition and exercise. The annual percentage of participants attending nutrition programs ranged from 33.6% (2019) to 43.12% (2022). Within the study period, the majority of attendees were 60-69 years old (43.6% - 58.3%) and White (73.5% - 81.7%) each year. Black attendees decreased from 10% (2019) to 5.9% (2022). Participants age 70+ increased from 8.6% (2019) to 17.5% (2022). For the clinical resources, a total of 5297 patients were referred in 4 years. The highest number of referrals were to the survivorship clinics (52%). Participants were mostly within the 65-74 age group (30%) and shifted to the 55-64 age group (31%) by 2022. Referrals to survivorship clinic in the 75+ age group saw a 64% decrease within the study period. Black patients were most frequently referred to palliative care, with the proportion of referrals decreasing from 18% (2019) to 11% (2022).

Conclusions: These data show differences in provider referrals to clinical survivorship resources for different age groups and White compared to Black women. There was a decrease in clinical referrals for older women, while it increased for Black patients. With patient attendance in non-clinical SPs, however, utilization is similar across race and age groups, with the majority choosing nutrition and exercise programs. Starting with these descriptive data, we plan further analysis to understand factors associated with SP participation and improve post-participation data capture. Future program development will address inclusivity of minority and elderly women, and equitable access to survivorship resources.

Table 1: Are there differences in survivorship program participation among breast cancer patients based on race or age?

Table 1. Participants of survivorship programs in calendar years *(CY) 2019 – 2022

Program Participant Race	# of Participants – CY2019	# of Participants – CY2020	# of Participants – CY2021	# of Participants – CY2022
Black	45 (10%)	46 (8.7%)	42 (6.5%)	34 (6.0%)
White	332 (73.5%)	400 (75.9%)	477 (74.2%)	471 (81.7%)
Other	75 (16.5%)	81 (15.4%)	124 (19.3%)	71 (12.3%)
Program Participant Age*				
18-39 years old	31 (6.9%)	16 (3.0%)	18 (2.8%)	27 (4.7%)
40-49 years old	60 (13.3%)	46 (8.7%)	67 (10.4%)	40 (6.7%)
50-59 years old	87 (19.2%)	104 (19.7%)	97 (15.1%)	89 (15.6%)
60-69 years old	197 (43.6%)	307 (58.3%)	339 (52.7%)	270 (47.0%)
70+ years old	39 (8.6%)	33 (6.3%)	88 (13.7%)	101 (17.6%)
Total # of Attendees	**452**	**527**	**643**	**576**

*Total will not equal 100% due to some participants non-response

1685701 - Socioeconomic Status Impacts Tumor Biology, Treatment, and Outcomes in Over 200,000 Patients with Invasive Lobular Carcinoma of the Breast: A National Cancer Database Analysis

Mandeep Kaur[1], Astrid Quirarte[1], Amy Shui[1], Elle Clelland[2], Harriet Rothschild[1], Laura Esserman[1], Cheryl Ewing[1], Rita Mukhtar[1]

[1]University of California San Francisco, San Francisco, CA, [2]University of California San Francisco, Loomis, CA

Background/Objective: While disparities in breast cancer are well-documented, little is known about the impact of disparities in invasive lobular carcinoma (ILC), a largely hormone receptor (HR) positive tumor type. Non-white patients with ILC have been shown to have worse outcomes, but data evaluating the impact of socioeconomic factors are limited. We evaluated the relationship between race and socioeconomic status (SES) with clinicopathological characteristics and outcomes in patients with stage I-III ILC using the National Cancer Database (NCDB).

Methods: Individual SES measures included insurance status (private insurance, Medicare, or Medicaid), income (reported in equally proportioned quartiles, Q1-Q4), and education status (reported in quartiles, with Q1 representing the highest percentage of adults aged 25 or older without a high school degree based on the patient's zip code and Q4 representing the lowest). We also created a composite SES variable using education and income: low SES, mid-low SES, mid-high SES, high SES. Comorbidities were measured using the Charlson-Deyo score. Clinicopathologic variables included tumor size, presence of lymphovascular invasion (LVI), receptor subtype (estrogen and progesterone hormone receptors, HR; human epidermal growth factor 2, HER2), and tumor grade. Overall survival was calculated with a multivariable Cox proportional hazards model.

Results: We identified 269,657 patients with stage I-III ILC. Of these, 226,868 identified as White (84%), 20,948 as Black (7.8%), 1,817 as East Asian (0.7%), and 17,494 as Other (6.5%). The distributions of tumor size, LVI, triple negative and HER2+ tumors, and grade III tumors differed significantly by insurance, income, education, and SES group (Table 1). Hormone positive and grade I tumors were more common amongst those with private insurance, income Q4, education Q4, and the high SES group. Those in the low SES group had the highest percentage receiving chemotherapy and the lowest percentage receiving endocrine therapy (39% chemotherapy in low SES versus 37% for high SES; 79% endocrine therapy in the low SES group versus 82% for high SES). In a multivariable model adjusting for SES group, age, stage, receptor subtype, grade, treatment, and Charlson-Deyo score, Black-identifying patients had a 14% higher risk of death by 5 years compared to White-identifying patients (HR 1.14, 95% CI 1.05-1.23, p=0.001). Asian-identifying and Other race/ethnicity participants had lower risks of death by 5 years (HR 0.62 for Asian-identifying, 95% CI 0.43-0.89, p=0.01; HR 0.79 for Other, 95% CI 0.72-0.88, p< 0.001).

Conclusions: While our study confirms several known disparities in the presentation, outcomes, and treatment of breast cancer, this is the first evaluation to assess how different components of SES influence ILC, specifically. Of particular interest is the difference in tumor biology by SES, as ILC is thought to be a largely non-aggressive tumor type. Understanding and addressing these disparities and drivers of difference in tumor biology within ILC is essential to improving quality of care and outcomes.

Table 1: ILC Characteristics by insurance, income, education, and composite socioeconomic status

	Insurance (n= 262,463)				Income (n=265,841)					Education (n=266,274)					Composite SES (n=265,841)				
Characteristic	Medicaid/no insurance (n=15,303)	Medicare (n=110,831)	Private Insurance (n=136,329)	p-value	Q1 (n=35,452)	Q2 (n=49,961)	Q3 (n=60,889)	Q4 (n=119,539)	p-value	Q1 (n=40,828)	Q2 (n=59,893)	Q3 (n=78,222)	Q4 (n=87,331)	p-value	Low (n=43,394)	Mid-low (n=65,472)	Mid-high (n=84,908)	High (n=72,067)	p-value
Tumor Size, mm (standard deviation)	30.0 ± 38.5	24.2 ± 26.9	25.0 ± 30.7	p<0.001	27.0 ± 36.3	26.4 ± 34.7	26.1 ± 34.2	25.0 ± 35.8	p<0.001	27.9 ± 39.9	26.5 ± 35.9	25.4 ± 33.5	24.6 ± 34.0	p=0.001	27.3 ± 36.7	26.6 ± 36.1	25.4 ± 34.3	24.6 ± 34.8	p<0.001
Positive Lymph Nodes, n	2.4 ± 5.0	1.5 ± 4.1	1.7 ± 4.1	p=0.003	1.8 ± 4.4	1.7 ± 4.3	1.7 ± 4.2	1.5 ± 4.0	p<0.001	1.8 ± 4.4	1.8 ± 4.3	1.6 ± 4.1	1.5 ± 3.9	p=0.001	1.9 ± 4.4	1.8 ± 4.3	1.6 ± 4.1	1.5 ± 3.9	p=0.001
HR+/HER2-	90.8%	92.7%	92.5%	p<0.001	91.4%	92.1%	92.5%	92.9%	p<0.001	91.1%	92.2%	92.6%	93.1%	p<0.001	91.2%	92.2%	92.7%	93.1%	p<0.001
HR-/HER2-	2.2%	2.0%	1.6%	p<0.001	2.3%	1.9%	1.7%	1.6%	p<0.001	2.3%	1.9%	1.7%	1.5%	p<0.001	2.3%	1.9%	1.7%	1.6%	p<0.001
HER2+	7.1%	5.4%	5.9%	p<0.001	6.4%	6.0%	5.8%	5.5%	p<0.001	6.6%	5.9%	5.7%	5.3%	p<0.001	6.5%	6.0%	5.7%	5.3%	p<0.001
Grade 3 Tumors	16%	11%	13%	p<0.001	13%	12%	12%	12%	p<0.001	14%	13%	12%	12%	p<0.001	14%	12%	12%	12%	p<0.001
Lymphovascular Invasion	21%	14%	16%	p<0.001	17%	15%	15%	15%	p<0.001	17%	16%	15%	15%	p<0.001	17%	15%	15%	15%	p<0.001

Data reported from complete case analyses. Q = quartile.

1688039 - Genetic Testing Uptake and Outcomes Among Diverse Patient Populations Using a Model of Universal Referral to Genetic Counseling

Angela Keleher[1], Brittany Sears[2], Melissa Tempest[1]

[1]USF/TGH, Tampa, FL, [2]Tampa General Hospital, Tampa, FL

Background/Objective: The American Society of Breast Surgeons recommends that genetic testing should be made available to all patients with a personal history of breast cancer given the potential impact of pathogenic variants (PVs) on surgical decision-making, medical oncology, and future risk management. However, previous research has demonstrated gaps in access to genetic testing, with non-white patients offered genetic testing at lower rates than their white counterparts. The aim of this study is to define germline genetic testing rates and outcomes among breast cancer patients of diverse race and ethnicity diagnosed at the single institution based in Tampa, FL.

Methods: Data was abstracted from the electronic medical record from a single institution located in Tampa, FL. All patients 18 and older diagnosed with breast cancer (ICD-10-CM: C50) from 2019-2022 that completed germline genetic testing were selected. After extraction, patients were grouped by their race and ethnicity: Hispanic, Non-Hispanic white (NHW), and Black or African American, or other (American Indian/Alaskan Native, Asian, other). Differential analysis was then performed.

Results: During calendar years 2019-2022, 569 individuals were diagnosed with breast cancer; Of these, 98.9% were female and 1.1% male; 57.8% were NHW, 21.2% Hispanic, 14.7% Black or African American, and 4.7% other races (American Indian/Alaskan Native, Asian, or other). Overall, half of these patients completed genetic testing, but rates of completion varied among patients' sex, race, and ethnicity. The rate of genetic testing tended to be higher in females than in males, but this difference was not statistically significant (48.5% female vs 37.5% male; $\chi 2 = 0.381$, p-value = 0.537). NHW patients had the shortest median time from diagnosis to GT at 50.5 days, followed by African American patients at 61.5 days, and Hispanic patients at 63.0 days; however, these times did not differ significantly between groups ($F = 0.954$, $df = 2$, $p = 0.387$). Rates of genetic testing did vary significantly by race and ethnicity, with 64.5% of Hispanic, 53.5% of African American, and 43.2% of NHW, patients completing testing ($\chi 2 = 16.7$, p-value < 0.001). NHW patients had slightly higher rates of germline mutations associated with breast cancer risks (ATM, BRCA2, CHEK2, PALB2, PTEN) than Hispanic patients (6.3% vs 5.1%), whereas no African American patients with breast cancer tested positive for a PV despite having the highest rates of triple-negative breast cancer (28.2% AA vs 11.3% NHW and 16.2% Hispanic patients). Variants of uncertain significance (VUS) occurred at a frequency of 35.9%, 40.1%, and 43.2% for Hispanic, NHW, and African American patients, respectively.

Conclusions: These data demonstrate that workflows incorporating universal referral for genetic counseling is an equitable practice that access to genetic information for all breast cancer patients, given that non-white patients took up genetic testing at the highest rates. However, important areas for follow-up include 1) the drivers of differences in time to receiving genetic test results to prevent delays to care, 2) personal factors influencing decisions not to complete testing, and 3) characterizing genetic underpinnings of triple-negative disease in African American populations, an active area of research.

1688060 - Disparities in Breast Cancer Screening Initiatives: Retrospective Exploration of Demographic Gaps in Breast Cancer Risk Assessment and High-risk Screening at a Tertiary Center

Bailey Johnson, Savannah Phipps, Kali Konstantinopoulos, Manjari Lokender, Jane Ambro, Sandra Althouse, Tarah Ballinger

Indiana University, Indianapolis, IN

Background/Objective: As breast cancer prevention becomes more precision-based and individualized, certain population-based screening systems fail to include the most vulnerable populations. Our tertiary center utilizes a standardized high-risk screening program (HRSP) for women at increased risk for breast cancer based on Tyrer Cuzick version 8 or Gail models, coordinating individualized screening and prevention services. We hypothesize that women at high risk for breast cancer who qualify for the HRSP, versus those who utilize it, exhibit significant demographic gaps.

Methods: Retrospective chart review was performed of women who met criteria set for the HRSP (age ≤65 and Gail 5-year risk ≥3% or TC v.8 to-year risk ≥8%, or recommended by the radiologist) June 2020 through June 2022 (n=485). High-risk women were identified in mammography and offered appointments by a mailed letter and navigator phone calls. Women who accepted to participate, scheduled an appointment, and were seen in clinic (n=309) were compared to women who declined involvement, no-showed for initial consultation, or were not reached (n=176). CDC Social vulnerability index (SVI) was evaluated using zip codes and data from the U.S. Census Bureau and American Community Survey. Comparisons across groups by age, race, insurance status, and SVI were made using the Wilcoxon test or Chi-square test as appropriate.

Results: Women attending the HRSP were significantly younger compared to those who did not (median age 50 vs. 59, p-value < 0.0001), with the proportion of women who attended appointments decreasing with increasing age (30-39: 81.6%, 40-49: 57.5%, 50-59: 29.7%, and ≥ 60: 21.9%). Black women were significantly less likely to accept and attend an appointment, compared to White women (18/74 24%, versus 150/398 38%, p value = 0.028). There was no significant difference found among patient insurance, with private insurance being most reported in both groups (79.3% vs. 76.7%, p=0.51). There was no difference in SVI between women who utilized the HRSP versus those who did not (0.66 vs. 0.68, p=0.19).

Conclusions: Older women and Black women were significantly less likely to accept or attend an appointment in a high-risk breast cancer screening program after undergoing risk assessment in mammography, despite use of a lay- navigator. Differences in utilization of a HRSP by race has particular importance; these women are in turn less likely to receive precision prevention and screening interventions such as breast MRI or tamoxifen, exacerbating racial disparities in breast cancer outcomes. This study highlights a need for specific and targeted methods to overcome barriers in this particular population to expand the breadth of our reach and have a more meaningful impact. Based on these findings, we have begun a targeted risk assessment program in collaboration with a community-based racial disparities advocacy group aimed at increasing response rate and participation in high-risk screening programs specifically for Black women. Further work will investigate additional socioeconomic factors, personal barriers, and motivators to participation in high-risk screening programs.

1688170 - Closing the Gap: Disparities in Breast Reconstruction Following Mastectomy

Glen Martin[1], Anjile An[2], Edward Gemson[2], Kevin Kensler[2], Lauren Mount[2], Vivian Bea[1], Rulla Tamimi[2]

[1]NewYork Presbyterian Brooklyn Methodist Hospital, Brooklyn, NY, [2]Weill Cornell Medicine Population Health Sciences, New York, NY

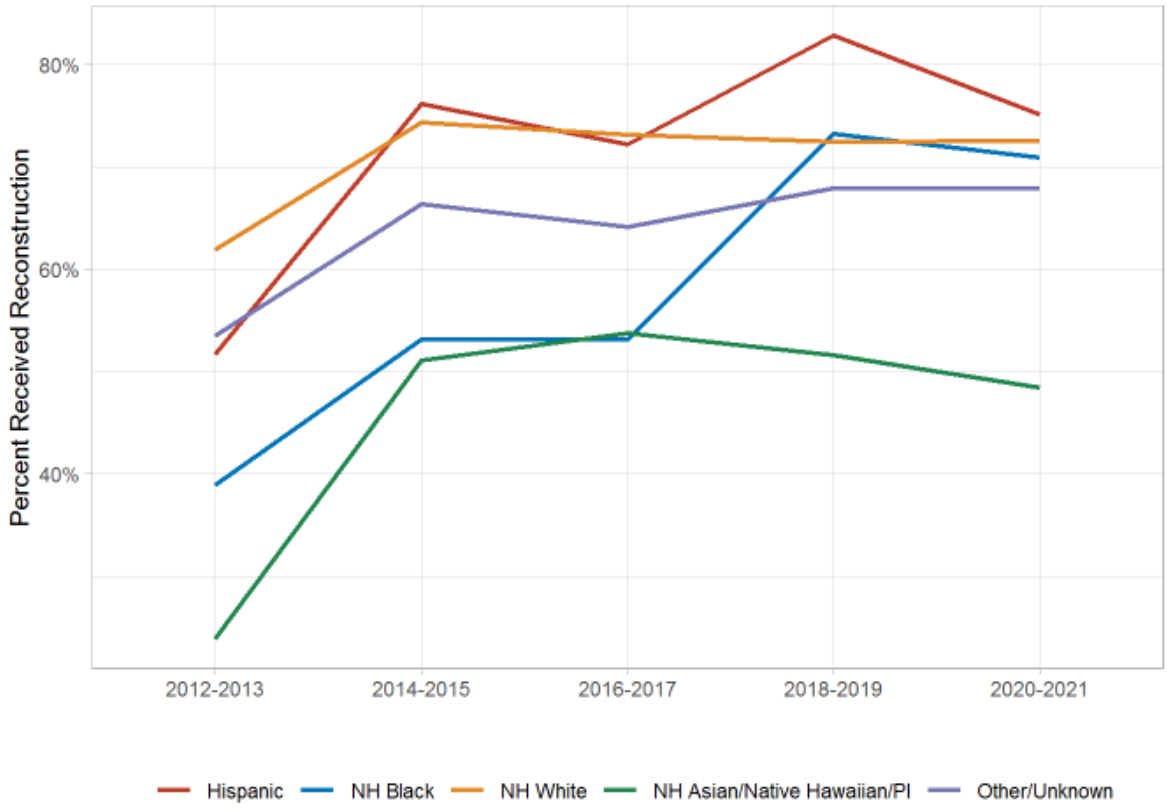
Background/Objective: Since mandating insurance coverage for breast reconstruction following mastectomy through the Women's Health and Cancer Rights Act in 1998, national reconstruction rates have steadily risen in breast cancer patients. However, this rise has not been uniform across demographics. Under the New York State 2010 Breast Cancer Provider Discussion Law (BCDL), physicians are now required to counsel patients on the availability of reconstructive options and provide plastic surgery referrals. In this study, we sought to identify disparities in breast reconstruction across the New York City (NYC) region and determine whether these disparities were ameliorated following implementation of state legislation.

Methods: INSIGHT Clinical Research Network offers electronic medical record data from over 15 million patients across NYC's five major academic health systems. Using this database, we identified female breast cancer patients, ≥18 years old, who underwent mastectomy between 2012 and 2021. Those who received reconstruction following mastectomy were then compared to those who did not. Information from the Census Bureau 2020 American Community Survey was used to capture zip code-level social determinants of health, including median income and percent high school completion. Rates of reconstruction were assessed over time by race/ethnicity to determine whether any identified disparity gaps narrowed throughout our study period. Descriptive statistics were used to characterize the study sample. The Fisher's exact test and Welch's two-sample t-test were used to compare demographic and clinical variables of interest by receipt of reconstruction, age at mastectomy, and race/ethnicity.

Results: There were 4,959 patients identified who underwent mastectomy. 3,390 (68%) of these patients received breast reconstruction, of which 2,794 (82%) had implant-based while 596 (18%) had autologous procedures. Patients in the reconstruction group were found to have a significantly higher average household income ($95,985 vs $87,999, $p< 0.001$), lower mean BMI (25.5 vs 27.1, $p< 0.001$), and lower mean Charlson score (1.36 vs 1.64, $p< 0.001$) compared to the no reconstruction group. The proportion of patients receiving reconstruction was significantly higher for age < 50 compared to age ≥50 (84% vs 59%, $p< 0.001$) and in upper quartiles of percent high school completion: 72% (Q4) vs 62% (Q1), $p< 0.001$. Reconstruction rates across our study period by race/ethnicity were 48% (Asian), 68% [Non-Hispanic Black, (NHB)], 72% [Non-Hispanic White, (NHW)], and 76% (Hispanic). Importantly, the 23.1% disparity gap in reconstruction rate between NHB and NHW patients amid BCDL's rollout in 2012 significantly lessened to 1.6% by 2021. A similar gap between Hispanic and NHW patients (10.2%) closed by 2015, with reconstruction rates now as high as 82.8%, surpassing those of NHW's.

Conclusions: Race, age, and neighborhood socioeconomic status play significant roles in a woman's likelihood of receiving breast reconstruction following mastectomy. This study has demonstrated the effectiveness of state policy in mitigating inequities in healthcare access for historically underserved populations. Since the enactment of BCDL, we've found a profound narrowing of the racial disparity gaps previously observed in breast reconstruction throughout the NYC region. This law may serve as a model for other state legislatures in targeting breast cancer disparities in their local communities.

Figure 1: Closing the disparity gap in breast reconstruction following mastectomy



1688315 - The Impact of Obesity on Survival in Black Patients with Breast Cancer

Macy Goldbach[1], Luke Keele[2], Rachel Berger[2], Elizabeth De Jesus[2], Kelly Allison[2], Oluwadamilola M. Fayanju[2], Katharine Rendle[2], Jennifer Zhang[2], Leisha C. Elmore[2], Tamara Cadet[2], Carmen Guerra[2], Robert Krouse[2], Julia Tchou[3]

[1]University of Rochester School of Medicine & Dentistry, Rochester, NY, [2]Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA, [3]University of Pennsylvania, Philadelphia, Philadelphia, PA

Background/Objective: Obesity is known to adversely affect breast cancer outcomes. Black women are disproportionally affected by obesity compared to women in other racial groups. The interaction between obesity and race in breast cancer outcomes, however, is not well understood. We aim to examine the impact of obesity on clinical outcomes in Black vs. non-Black breast cancer patients.

Methods: Our retrospective study cohort is comprised of consecutive patients treated at a large academic healthcare system between 2010 – 2017 who have complete demographic, histologic, treatment, and body mass index (BMI) data at the time of their primary unilateral non-metastatic invasive breast cancer diagnosis (n=4,542). Patients with normal weight, overweight and obesity were defined as those with BMI < 25, 25-29.9, and ≥30 kg/m2 respectively. Demographics and clinical characteristics by BMI were compared using chi-square and ANOVA tests. Inverse probability weighting (IPW) was performed to examine the interaction between race and normal weight, overweight and obesity on overall survival (OS) controlling for potential confounders including age at diagnosis, co-morbidity (estimated by Charlson Deyo comorbidity index), insurance status, income, breast cancer subtype, pathologic stage, surgery type, receipt of adjuvant systemic, and radiation therapy.

Results: Overall, 35% of patients in our study cohort had obesity. Black patients were disproportionately affected by obesity (56%) compared to White patients (30%) ($p< 0.001$). Patients with obesity were more likely to have Charlson Deyo scores ≥2 compared to those with normal or overweight (13.9% vs. 4.4% vs. 8.6%, $p< 0.001$). Patients with obesity were more likely to have stage III disease than patients with normal or overweight (39% vs. 30% vs. 31%, $p=0.04$). There was no difference in subtype distribution across the three BMI subgroups ($p=0.29$). Unadjusted death rate was highest in patients with obesity at 16% followed by those with overweight and normal weight at 14% and 11% respectively, $p< 0.001$. IPW analyses showed that Black patients with overweight had significantly worse OS than non-black counterparts (hazard ratio (HR) 2.09, 95% confidence interval (CI) 1.04-4.24, $p=0.04$. For patients with normal weight or obesity, there were no differences in OS between Black vs. non-Black patients.

Conclusions: Our results showed that Black breast cancer patients with overweight fared worse than non-Black counterparts. Given the higher rates of obesity among Black women, a weight loss intervention that is equitably implemented may have an outsize effect on reducing the downstream disparities in outcome observed among Black patients with breast cancer relative to non-Black patients.

Table 1. Demographic and clinical characteristics of non-metastatic invasive breast cancer patients stratified by BMI group

	Total		**Normal weight BMI < 25** kg/m^2		**Overweight BMI 25 - 29.9** kg/m^2		**Obesity BMI ≥30** kg/m^2		**P**
n, %	4542	100%	1585	35%	1357	30%	1600	35%	-
Age, mean ± SD	58.3 ± 12.74		55.4 ± 13.5		59.7 ± 12.5		59.9 ± 11.6		<0.001
Race									
White	3395	75%	1341	40%	1022	30%	1032	30%	<0.001
Black	949	21%	137	14%	282	30%	530	56%	
Asian/Pacific Islander	147	3%	87	59%	40	27%	20	14%	
Charlson Deyo Score									
0	3168	70%	1249	39%	970	31%	949	30%	<0.001
1	861	19%	245	29%	246	29%	370	43%	
2	296	7%	53	18%	86	29%	157	53%	
3+	114	3%	18	16%	31	27%	65	57%	
Subtype									
HR+/HER2-	3361	74%	1166	35%	1005	30%	1190	35%	0.29
HER2+	573	13%	218	38%	173	30%	182	32%	
TNBC	565	12%	189	34%	164	29%	212	38%	
Pathologic Stage									0.04
I	2670	59%	956	36%	812	30%	902	34%	
II	1441	32%	501	35%	410	29%	530	37%	
III	431	10%	128	30%	135	31%	168	39%	
Follow up (months), median (IQR)	70 (51-92)		72 (52-93)		68 (50-91)		68 (50-90)		0.01
Total Deceased	612	14%	168	11%	193	14%	251	16%	<0.001

1688494 - Effect of Race/Ethnicity on Long-term Cytopenias and Major Infections in Adolescent Young Adult Breast Cancer Survivors

Alyssa Bellini[1], Theresa Keegan[2], Qian Li[3], Frances Maguire[4], Victoria Lyo[5], Candice Sauder[6]

[1]University of California Davis School of Medicine, Sacramento, CA, [2]Comprehensive Cancer Center, University of California Davis, Sacramento CA, [3]Center for Oncology Hematology Outcomes Research and Training (COHORT) and Division of Hematology and Oncology, University of California Davis School of Medicine, Sacramento, CA, [4]California Cancer Reporting and Epidemiologic Surveillance Program, University of California Davis Comprehensive Cancer Center, Sacramento, CA, [5]Center for Alimentary and Metabolic Science, University of California Davis School of Medicine, Sacramento, CA, [6]University of California Davis Health Comprehensive Cancer Center, Sacramento, CA

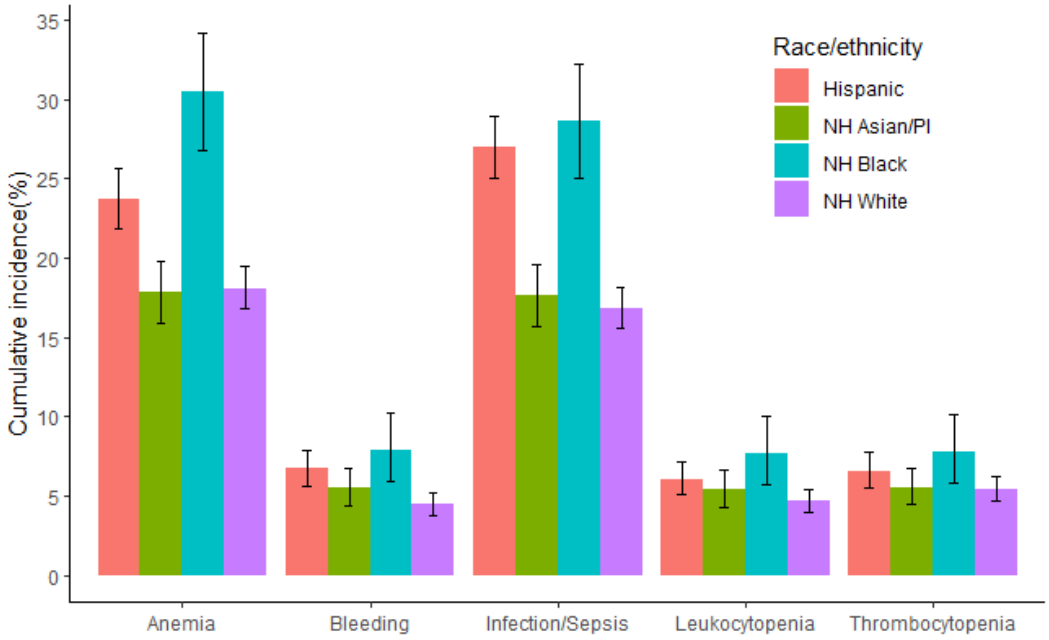
Background/Objective: Many adolescent and young adult (AYA) breast cancer (BC) patients receive chemotherapy as part of their initial treatment and long-term bone marrow suppression is a potential complication, but no studies have evaluated the impact of race/ethnicity on the development in AYA BC survivors. The purpose of this study was to identify AYA breast cancer survivors at higher risk of the late effects of bone marrow suppression.

Methods: Female patients ages 15-39 diagnosed with BC between 2006-2018 and surviving ≥2 years were identified from the California Cancer Registry and linked to statewide hospitalization, emergency department and ambulatory surgery data. We estimated the cumulative incidence of developing late effects: anemia, leukopenia, thrombocytopenia, bleeding or major infection/sepsis (≥ 2 years after diagnosis). We accounted for death as a competing risk, and examined the impact of sociodemographic and clinical factors using calculated multivariate Cox proportional hazards regression.

Results: Of 11,293 patients, 42.8% were non-Hispanic (nH) White, 28.8% Hispanic, 19.5% Asian/Pacific Islander, and 7.5% nH Black. At diagnosis, 72.9% had local or regional disease (27.9% stage I, 45% stage II), and were mostly treated with surgery (92.2%) and chemotherapy (77.1%). The 5-year cumulative incidence for anemia (21.5% vs 17.4%), leukopenia (5.9% vs 4.0%), thrombocytopenia (6.5% vs 3.7%), and infection/sepsis (22.0% vs 16.9%) were greater following initial treatment with chemotherapy versus no chemotherapy ($p< 0.0001$), but not bleeding. In multivariable analyses, nH Blacks had the highest risk (vs. nH Whites) of anemia [Hazard Ratio (HR) 1.72, 95% Confidence Interval (CI) 1.47-2.02], leukopenia [HR: 1.56, CI 1.14-2.13], thrombocytopenia [HR: 1.46, CI 1.08-1.99], major infection/sepsis [HR: 1.64, CI 1.4-1.92], and bleeding [HR: 1.89, CI 1.39-2.58]. Hispanics had a higher risk of developing anemia, [HR: 1.17, CI 1.04-1.32] bleeding, [HR: 1.4, CI 1.12-1.76] and major infections/sepsis [HR: 1.36, CI 1.21-1.52]. Whereas Asian/Pacific Islanders had only a higher risk of developing bleeding [HR: 1.33, CI 1.03-1.72] when compared to nH Whites.

Conclusions: Our study was the first to identify that AYAs of Black, Hispanic, and Asian/Pacific Islander race/ethnicity are at an increased risk of several late effects after chemotherapy compared with nH Whites. From this data, providers can implement early/frequent screening of these hematologic effects in these high-risk populations and potentially start screening these patient populations earlier for BC hoping to reduce the need for chemotherapy in these populations.

Figure 1: Cumulative incidence of cytopenias and resulting symptoms at 5 years after diagnosis with breast cancer by race/ethnicity



1688614 - Identifying Disparities in Timely Receipt of Radiation After Breast-conserving Surgery

Nicole Reyes, Amanda Mendiola, Mary Murray, Andrew Fenton, Adina Brett-Morris

Cleveland Clinic Akron General, Akron, OH

Background/Objective: Radiation therapy after breast-conserving surgery reduces the local recurrence and improves survival. The new standard set forth by the Commission on Cancer (CoC) requires that radiation, when administered, is initiated in less than or equal to 60 days of definitive surgery for patients receiving breast-conserving surgery for Stage I-III breast cancer who do not undergo adjuvant chemo or immunotherapy. Timely access to radiation is critical, and yet there still exists a modest amount of women who experience delays in the initiation of radiation. We aim to highlight this disparity at our institution and identify the socioeconomic factors that contribute to it.

Methods: Using the Breast Cancer Registry, we conducted a retrospective analysis of women diagnosed with stage I-III breast cancer, age 18 or older and under the age of 70, who underwent breast-conserving surgery between 2011 and 2021. Women who received chemotherapy were excluded. We stratified patients based on socioeconomic factors and examined which attributed to an increased interval from surgery to initiation of radiation greater than the current standard of 60 days. Statistics are presented as frequencies and percentages, and comparisons between groups obtained using Chi-squared tests or Fisher's exact tests as appropriate. A significance level of 0.05 was assumed for all tests. Analyses were performed using SAS Software (Version 9.4, Cary NC).

Results: A cohort of 658 women meeting the inclusion criteria was identified. The median age was 58. Ninety-six percent (96%) of women received radiation within 12 months. Most patients received adjuvant radiation within the new standard of 60 days from definitive surgery (73%). However, patients of white race were significantly more likely to receive adjuvant radiation within 60 days from final surgery (75.4%) compared to patients of other races (57%). In addition, patients with private insurance or Medicare were more likely to receive adjuvant radiation within the current set standard (76.7% and 71.8%, respectively) in comparison to patients with Medicaid (56%).

Conclusions: This analysis identifies disparities in breast cancer treatment among minority populations at our institution. It also suggests insurance status can affect the receipt of treatment in a recommended time frame. There is research that shows a delay in radiation impairs survival. These results indicate that improving access to timely adjuvant radiation may be leveraged to lessen disparities experienced by minority races regardless of insurance status.

Table 1: Impact of race and insurance on receipt of radiation within 60 days of definitive surgery

Characteristic	Radiation within 60 days of Definitive surgery, n (%)		P value
	Yes (n=480)	No, (n=178)	
Race			
White	427 (75.44)	139 (24.56)	0.0006
Black	47 (59.49)	32 (40.51)	
Other	5 (41.67)	7 (58.33)	
Primary Payer at Diagnosis			
Private	224 (76.71)	68 (23.29)	0.1847
Medicaid	18 (56.25)	14 (43.75)	
Medicare	199 (71.84)	78 (28.16)	
Not Insured	8 (72.73)	3 (27.27)	
Other	14 (66.67)	7 (33.33)	
Insurance status unknown	17 (68.00)	8 (32.00)	

1688202 - Unveiling the Disparities in Triple-negative Breast Cancer Outcomes Among the Hispanic Population Living in Latin America versus the United States

Gabriel De la Cruz Ku[1], Alanna Hickey[1], Bryan Valcarcel[2], Carly Wareham[3], Alexandra Hernandez[4], David Linshaw[1], Sarah Persing[5], Salvatore Nardello[3], Christopher Homsy[6], Abhishek Chatterjee[6], Gonzalo Ziegler[7]

[1]University of Massachusetts Medical School, Worcester, MA, [2]Milken Institute School of Public Health, The George Washington University, Washington, DC, [3]Tufts Medical Center, Boston, MA, [4]University of Miami Medical School, Miami, FL, [5]Tufts Medical Center, Division of Surgical Oncology and Breast Surgery, Boston, MA, [6]Division of Plastic and Reconstructive Surgery, Tufts Medical Center, Boston, MA, [7]Instituto Nacional de Enfermedades Neoplasicas, Lima, Peru

Background/Objective: Triple-negative breast cancer is a heterogeneous disease with a significant prevalence of 12-24% in the Hispanic population. Previous research has demonstrated that disparities in healthcare access and social determinants of health significantly influence patient outcomes, including underrepresented groups such as Hispanic females. We aimed to compare the clinic-pathological characteristics and outcomes of Hispanic females with triple negative breast cancer living in Latin-America (HPLA) to the Hispanic population in the United States (HPUS).

Methods: We evaluated two retrospective cohorts, patients diagnosed with TNBC at the Instituto Nacional de Enfermedades Neoplasicas (INEN), the largest tertiary cancer center in Peru during 2000-2015; and Hispanic-Latino patients with TNBC from the SEER Research Data. Descriptive statistics were performed to compare clinic pathological characteristics. Overall survival (OS) rates were estimated with the Kaplan-Meier method and compared with the Log-rank test.

Results: A total of 2007 HPLA and 8457 HPUS were included. The HPLA was younger (mean: 50.15 vs. 54.16 years, $p< 0.001$) and more frequently living in rural areas (49.4%% vs. 3.5%, $p< 0.001$). Both populations had similar rates of ductal and lobular carcinomas (93.5 vs. 93.5%, p=1.00). However, HPLA had higher T (T4: 42.2% vs. 7.2%; $p< 0.001$) and N (N+: 65.1% vs. 40.2%, $p< 0.001$) stages. Similarly, advanced AJCC stages were higher in HPLA (III: 51.6% vs. 20.8%, $p< 0.001$). HPLA underwent more neoadjuvant (37.1% vs. 31.2%, $p< 0.001$) and adjuvant chemotherapy (49.2% vs. 39.0%, $p< 0.001$), as well as radiotherapy (50.4% vs. 41.1%, $p< 0.001$). The median follow-up was 67 months. Subgroup analysis for stages I and II without neoadjuvant chemotherapy found that mastectomies were more frequently performed in HPLA (56.3% vs. 44.3%, $p< 0.001$) despite health insurance not covering reconstruction. Stratified analysis by AJCC stages showed that 5-year OS rates between HPLA and HPUS were similar for stages I (92% vs. 89%, p=0.52) and II (82% vs. 79%, p=0.11). Nevertheless, worse 5-year OS rates were found in stages III (40% vs. 52%, $p< 0.001$) and IV (5% vs. 11%, $p< 0.001$) among HPLA compared to HPUS.

Conclusions: HPLA were more frequently diagnosed at advanced stages and usually underwent mastectomies even in early TNBC stages. Despite outcomes in this study are worse than other US racial/ethnic groups, similar survival rates between both cohorts were found in early stages. However, there was an abrupt worsening of outcomes in HPLA when advanced stages were analyzed. Interventions are urgently needed in HPLA from screening to optimal treatment in advanced stages.

1656227 - Evaluation of Physician Knowledge of Breast Cancer Screening Recommendations for the Transgender Population at an Academic Hospital

Andrew Brown[1], Molly Hill[2], Rebecca Farmer[2], Lyndsey Kilgore[2], Elizabeth Jeffers[2], Kelsey Larson[1], Jamie Wagner[3], Jordan Baker[2], Isuru Ratnayake[2], Lynn Chollet-Hinton[2], Christa Balanoff[2]

[1]University of Kansas Medical Center, Overland Park, KS, [2]University of Kansas Medical Center, Kansas City, KS, [3]University of Kansas, Kansas City, KS

Background/Objective: The American College of Radiology, UCSF Center of Excellence for Transgender Health, Fenway Health, and the Endocrine Society have published breast cancer screening clinical practice guidelines for transgender individuals. Uptake of these recommendations is widely unknown; therefore, we hypothesized that providers

within our academic hospital system are unfamiliar with the recommendations and uncomfortable discussing transgender breast care.

Methods: A voluntary, anonymous survey was e-mailed via RedCap to 303 physicians within our academic hospital system. Survey recipients were identified via departmental websites as potentially caring for the transgender population. The survey utilized six questions to assess the current knowledge base regarding breast cancer screening recommendations and physician comfort level discussing these recommendations in the transgender population. Descriptive statistics and Likert scale responses were analyzed both quantitatively and qualitatively. Statistical tests included Wilcoxon rank sum tests for continuous variables and Fisher's Exact tests for categorical variables using R (version 4.2.1) with a significance level of $p< 0.05$.

Results: Eighty-five physicians (28%) responded to the survey. The majority (82.4%) stated that they provide care for transgender patients in their practice. More than half (62.4%) were unfamiliar with the current screening recommendations and most (89.4%) stated they have received no formal education regarding the topic. There was a significant association between provider comfort with discussing breast cancer screening recommendations for the transgender population and level of previous education on the topic ($p < 0.001$ and $p= 0.006$, respectively). Most respondents (85.9%) reported interest in receiving formal training on the topic of breast cancer screening for transgender individuals, regardless of their current comfort levels ($p = 0.256$). See Table 1 for full details.

Conclusions: Most respondents in our organization state that, while they care for transgender patients, they are unfamiliar with current breast cancer screening recommendations. Despite interest in receiving education, formal educational programming has not been provided. Health care disparities within the lesbian, gay, bisexual, transgender, queer, intersex, asexual (LGBTQIA+) community are well documented. However, there is little data evaluating breast cancer screening for this population and no data evaluating provider knowledge base and needs. Our study bridges this critical gap in knowledge, highlighting that providers do not feel knowledgeable about or comfortable with discussing breast cancer screening with transgender patients. Considering these findings, we recommend that formal educational opportunities be developed and implemented as a means of addressing this healthcare disparity.

Table 1: Transgender breast screening knowledge

Survey Questions	N = 85[1]
Which of the below best describes your specialty?	
Breast Surgical Oncology	3 (3.5%)
General Surgery	5 (5.9%)
Medical Oncology	10 (11.8%)
OB/GYN	10 (11.8%)
Plastic Surgery	7 (8.2%)
Primary Care (family medicine/internal medicine)	24 (28.2%)
Psychiatry/Psychology	15 (17.6%)
Radiation Oncology	5 (5.9%)
Radiology	6 (7.1%)
Do you care for transgender patients in your practice?	
No	15 (17.6%)
Yes	70 (82.4%)
Are you familiar with transgender breast cancer screening guidelines (such as the American College of Radiology, Endocrine Society, UCSF, or Fenway Health)?	
No	53 (62.4%)
Yes	32 (37.6%)
Have you received formal education on transgender breast cancer screening recommendations?	
No	76 (89.4%)
Yes	9 (10.6%)
How would you rate your current comfort level with discussing breast cancer screening recommendations for the transgender population? (Ranked 1-5)	
Mean (SD)	3.2 (1.2)
Median (IQR)	3.0 (2.0, 4.0)
Would you be interested in receiving formal education regarding transgender breast cancer screening?	
No	12 (14.1%)
Yes	73 (85.9%)
How would you rate your current comfort level with discussing breast cancer screening recommendations for the transgender population?	
Very Uncomfortable	4 (4.7%)
Uncomfortable	21 (24.7%)
Neutral	30 (35.3%)
Comfortable	12 (14.1%)
Very Comfortable	18 (21.2%)

1670247 - A Novel Way to Include Weight Management into Breast Care within a Culturally Diverse Patient Population

Genevieve Fasano[1], Ashley Gordon[2], Jennifer Yeung[2], Solange Bayard[1], Julia Burleson[2], Vicki Haken[3], Deanna Saab[2], Vivian Bea[2]

[1]New York Presbyterian - Weill Cornell Medicine, New York, NY, [2]New York Presbyterian Brooklyn Methodist Hospital, Brooklyn, NY, [3]New York Presbyterian Brooklyn Methodist Hospital, New York, NY

Background/Objective: Several large epidemiological studies and meta-analyses have demonstrated that obesity is linked to breast cancer risk and obese breast cancer patients have worse outcomes for survival and recurrence. Current guidelines for weight management lack methods for providers to engage with and counsel patients longitudinally. In this study, we sought to develop a patient-centered, culturally sensitive approach to introduce weight management into the delivery of breast health care for high-risk breast patients, newly diagnosed breast cancer patients, and breast cancer survivors among a culturally diverse patient population.

Methods: All adult female patients identified as being high risk for breast cancer, newly diagnosed with breast cancer, and breast cancer survivors were screened for eligibility in the breast surgery clinic. Patients were eligible if they had a body mass index (BMI) of at least 27 kg/m2. After check-in, each patient was given an iPad with one of three short cartoon videos tailored to their experience (high-risk, newly diagnosed with breast cancer and, breast cancer survivor) to introduce the link between breast cancer risk and weight management. A survey was then administered immediately after the video to evaluate knowledge, self-perceived risk, and interest in weight management resources.

Results: 60 patients viewed the video and completed the survey. More than half (57%) self-identified as Black or African American. Nearly half (48%) of patients reported a lack of knowledge regarding the link between being overweight and breast cancer risk. The majority (83%) of patients reported that they perceived their body weight as “too much.” Regarding prior attempts at weight loss, 32% of patients reported diet, 35% utilized exercise, 3% had weight loss surgery, 7% had taken medication, and 22% reported no prior attempts at weight loss. Overall, 87% of patients surveyed expressed interest in learning about referral to our weight management doctor. Nutritionist referral (46%) and exercise guidance (13%) were the two most highly sought resources.

Conclusions: Our data demonstrate a lack of knowledge regarding the link between body weight and breast cancer risk. Weight management education and referral to weight management resources can successfully be incorporated into the delivery of comprehensive breast health care, among high-risk, breast cancer patients, and survivors.

1683973 - Changes in Breast Cancer Treatment During the COVID-19 Pandemic: A National Cancer Database Analysis

Olivia Galloway[1], Georgia Montone[2], Stephanie Kjelstrom[2], Ned Carp[3]

[1]Lankenau Medical Center, Main Line Health Systems, Philadelphia, PA, [2]Lankenau Institute of Medical Research, Wynnewood, PA, [3]Lankenau Medical Center, Wynnewood, PA

Background/Objective: The coronavirus-19 (COVID-19) pandemic disrupted healthcare delivery in breast cancer care in all stages of management, from screening to treatment. Women with early stage hormone positive disease were recommended to undergo neoadjuvant endocrine therapy to safely delay surgery. To minimize length of hospital stays, patients were encouraged to undergo partial mastectomy and discouraged from undergoing contralateral prophylactic mastectomy and immediate reconstruction. This study sought to utilize the National Cancer Database (NCDB) to investigate the changes in breast cancer treatment patterns and time to treatment as a result of the COVID-19 pandemic on a national level.

Methods: In this IRB-approved study, females diagnosed with breast cancer in 2019 (pre-COVID) and 2020 (during-COVID) were identified from the NCDB. Demographic variables including age, race/ethnicity, median income quartile, health insurance status, and geographic location were recorded. The average and interquartile ranges of time to any treatment, hormone therapy, chemotherapy, radiation, partial mastectomy, total mastectomy, sentinel lymph node biopsy, axillary dissection, and reconstruction as well as percentage of patients undergoing each treatment were compared between the pre-COVID and during-COVID periods. Patients were further stratified by the demographic variables and further analyzed in each treatment group.

Results: A total of 500,233 patients who underwent breast cancer treatment were identified from the NCDB. Treatment after diagnosis started sooner during the pandemic, within 33 days vs 34 days pre-pandemic ($p< 0.001$). There was a decrease in days to initiation of hormone therapy (109 days vs 120 days, $p< 0.01$) and chemotherapy (53 days vs 57 days, $p< 0.001$) during COVID. During the pandemic, there was a delay in surgical treatment, particularly partial mastectomies (42 vs 41 days, $p= 0.005$) and total mastectomies with contralateral prophylactic mastectomy (CPM, 62 vs 59 days, $p= 0.008$). African American patients had the largest delay to partial mastectomies (55 days vs 51 days, $p=0.003$) and total mastectomies with CPM (100 days vs 81 days, $p=0.018$) compared to other races and ethnicities. There was a delay in radiation initiation during the pandemic (118 vs 114 days, $p=0.02$). There was no significant delay to reconstruction during the pandemic ($p=0.104$). There were differences in rates of usage of each treatment as a result of the pandemic. Patients in the lowest median income quartile had the greatest decrease in use of chemotherapy (15.4% vs 16.1%, $p=0.004$), radiation (13.3% vs 13.7%, $p=0.018$) and hormone therapy (13.3% vs 13.7%, $p=0.007$) during the pandemic, while those in higher income groups had increased or similar rates of usage of these treatments.

Conclusions: COVID-19 affected the treatment of breast cancer patients disproportionately. While hormone therapy and chemotherapy started sooner during COVID-19, surgical delays occurred, particularly partial mastectomies and total mastectomies with CPM. African Americans had the greatest surgical delay pre-COVID and the greatest increase in time to surgery during COVID, further exacerbating existing healthcare disparities. Additionally, low income patients had decreased use of chemotherapy, radiation, and hormone therapy during the pandemic. Further investigations are needed to determine if these treatment changes had an impact on survival particularly for demographic groups that were disproportionately affected.

Figure 1. Changes in time to treatment pre-COVID (2019) and during-COVID (2020)

Treatment, days from diagnosis (Med/IQR)	2019	2020	p
Any treatment started	**34 (21 - 50)**	**33 (20-49)**	**<0.001**
Race			
White	34 (21-50)	32 (20-48)	<0.001
Black	36 (20-57)	35 (18-55)	<0.001
Asian American/Pacific Islander	35 (20-53)	33 (19-49)	<0.001
Other	38 (22-56)	35 (21-53)	<0.001
Ethnicity			
Hispanic	39 (22-60)	36 (21-56)	<0.001
Non-Hispanic	34 (20-50)	32 (19-48)	<0.001
Patient Residence Area Median Income Quartiles 2016-2020			
<$46,277	35 (20-53)	33 (19-50)	<0.001
$46,277-$57,856	34 (21-51)	33 (20-49)	<0.001
$57,857-$74,062	34 (21-51)	33 (20-48)	<0.001
$74,063 +	34 (20-50)	32 (20-47)	<0.001
First Surgery, Days from dx	**38 (22-62)**	**38 (22-64)**	**0.001**
Race			
White	37 (22-59)	37 (22-62)	0.015
Black	43 (22-78)	43 (22-85)	0.107
Asian American/Pacific Islander	40 (22-66)	40 (22-70)	0.301
Other	43 (25-75)	44 (25-85)	0.363
Ethnicity			
Hispanic	48 (26-85)	47 (25-84)	0.464
Non-Hispanic	38 (22-61)	37 (22-63)	0.001
Patient Residence Area Median Income Quartiles 2016-2020			
<$46,277	40 (22-69)	39 (22-71)	0.956
$46,277-$57,856	38 (22-63)	38 (22-65)	0.498
$57,857-$74,062	38 (23-62)	38 (22-64)	0.265
$74,063 +	37 (22-59)	37 (22-62)	0.004
Partial Mastectomy	**41 (28-64)**	**42 (27-70)**	**0.005**
Race			
White	40 (27-60)	40 (27-64)	0.102
Black	51 (33-104)	55 (34-134)	0.003
Asian American/Pacific Islander	48 (30-76)	47 (29-83)	0.981
Other	45 (28-83)	46 (30-85)	0.629
Ethnicity			
Hispanic	54 (35-103)	50 (31-111)	0.165
Non-Hispanic	41 (27-63)	41 (27-69)	0.003
Patient Residence Area Median Income Quartiles 2016-2020			
<$46,277	43 (28-74)	44 (27-85)	0.536
$46,277-$57,856	42 (27-67)	42 (27-70)	0.781
$57,857-$74,062	40 (27-62)	41 (27-68)	0.046
$74,063 +	41 (27-63)	41 (27-68)	0.109
Total mastectomy without CPM	**51 (31-99)**	**51 (31-113)**	**0.056**
Race			
White	49 (30-90)	49 (29-102)	0.290
Black	63 (37-145)	66 (38-154)	0.105
Asian American/Pacific Islander	54 (33-112)	53 (33-128)	0.862
Other	64 (38-158)	65 (41-157)	0.826
Ethnicity			
Hispanic	70 (39-174)	73 (41-175)	0.275
Non-Hispanic	50 (30-94)	50 (30-108)	0.083
Patient Residence Area Median Income Quartiles 2016-2020			
<$46,277	51 (30-109)	54 (31-128)	0.029
$46,277-$57,856	51 (31-99)	51 (31-112)	0.766
$57,857-$74,062	51 (31-98)	51 (30-113)	0.979
$74,063 +	51 (31-98)	50 (31-113)	0.926
Total Mastectomy with CPM	**59 (36-159)**	**62 (36-168)**	**0.008**
Race			
White	57 (35-149)	58 (35-162)	0.067
Black	81 (44-189)	100 (48-195)	0.018
Asian American/Pacific Islander	63 (36-172)	69 (37-175)	0.272
Other	67 (41-177)	56 (37-176)	0.213
Ethnicity			
Hispanic	89 (49-198)	124 (49-198)	0.072
Non-Hispanic	58 (36-154)	59 (35-165)	0.033
Patient Residence Area Median Income Quartiles 2016-2020			
<$46,277	112 (40-201)	115 (40-203)	0.859
$46,277-$57,856	88 (38-195)	101 (39-194)	0.815
$57,857-$74,062	91 (40-194)	106 (39-194)	0.847
$74,063 +	99 (41-188)	99 (38-187)	0.253
Hormone Therapy	**120 (74-192)**	**109 (62-180)**	**<0.001**
Radiation Therapy	**114 (80-211)**	**118 (81-210)**	**0.020**
Chemotherapy	**57 (34-87)**	**53 (32-83)**	**<0.001**

1685590 - Defining the Need for Services for Patients at High Risk of Breast Cancer at a Safety-Net Hospital: An Approach to Narrowing the Disparities Gap

Olivia Cheng[1], Caroline Fiser[1], Jamie Paysour[1], Ruchi Aluwalia[1], Aysia Hilliard[2], Cletus Arciero[3], Clara Farley[1], Jade Jones[1], Jesse Conyers[1], Lauren Postlewait[4]

[1]Emory University, Atlanta, GA, [2]Grady Health System, Atlanta, GA, [3]Emory University Hospital, Atlanta, GA, [4]Division of Surgical Oncology, Emory University School of Medicine, Atlanta, GA

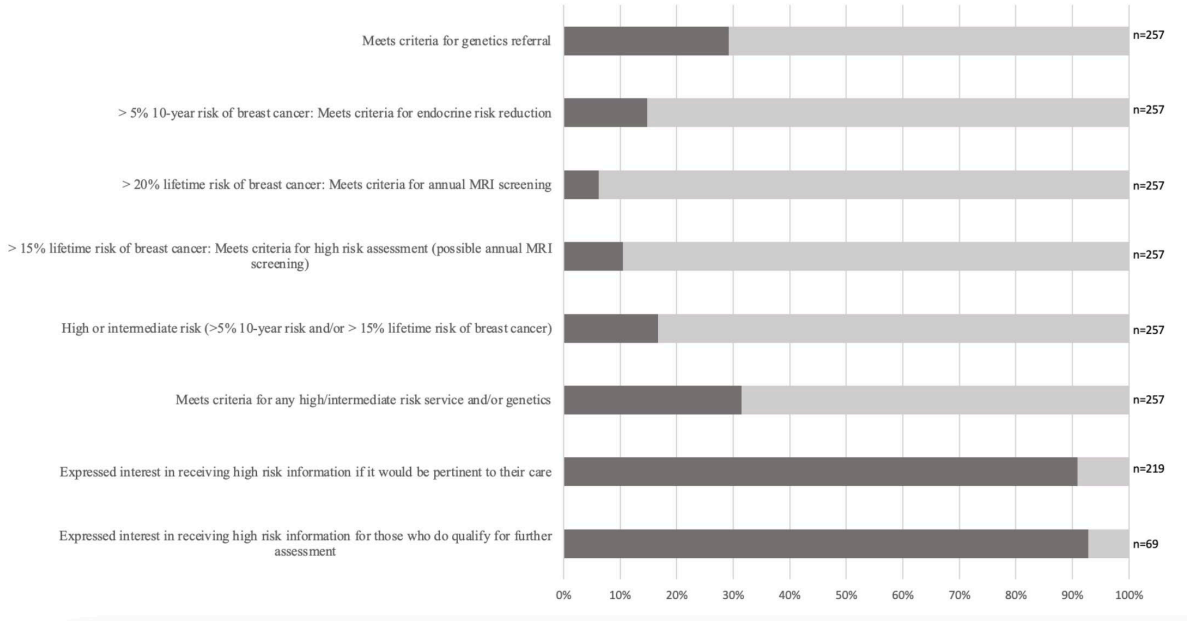
Background/Objective: Disparities in breast cancer (BC) outcomes based on income and race have been reported. While the etiology of these inequities is likely multifactorial and poorly understood, one approach to narrow the outcomes-gap could be through identification and care of patients at high-risk of BC in vulnerable populations. The National Accreditation Program for Breast Cancer (NAPBC) standards were recently changed to promote BC risk-assessment and subsequent referral for high-risk services. As a prelude to developing a comprehensive, standardized approach to breast cancer risk assessment and enrollment in high-risk services, at our center (a safety-net hospital system), we sought to estimate the proportion of patients at high-risk of BC in our community, gauge patient interest in high-risk services, and define resources needed in order to develop such a comprehensive program at our institution.

Methods: Patients who presented for breast imaging at our center during a 2-week period (06/05/23-06/16/23) were surveyed regarding BC risk factors and interest in high-risk services. Patients with history/diagnosis of BC were excluded (n=35). Charts were reviewed. Tyrer-Cuzick (TC) Model Version 8 was used to calculate BC risk. High-risk was defined as ≥5% 10-year risk (recommend endocrine risk-reduction) or ≥20% lifetime-risk (recommend annual screening MRI). Intermediate-risk was defined as ≥15-< 20% lifetime-risk (consider screening MRI). Criteria for genetics referral were based on National Comprehensive Cancer Network guidelines.

Results: A total of 257 patients had risk assessments calculated from information provided on their surveys. All patients were female with average age of 56 years. The majority 81.7% (n=210) were black, 1.6% (n=4) white, 0.8% (n=2) Asian, and 16% (n=41) other/undisclosed. In terms of ethnicity, 81.7% (n=210) were non-Hispanic, 10.5% (n=27) Hispanic, and 7.8% (n=20) undisclosed. The proportions of patients who were at high/intermediate-risk of BC, who qualified for high-risk services, and who expressed interest in high-risk services are shown (Figure). TC risk assessment revealed 14.8% of patients (n=38) with ≥5% 10-year BC risk (qualifying for consideration of endocrine therapy), 6.2% (n=16) ≥20% lifetime-risk (qualifying for annual screening MRI), and 10.5% (n=27) ≥15% lifetime risk (meeting criteria for a high-risk assessment with a dedicated provider). When family and personal history were considered, 23.7% (n=61) met criteria for genetic testing based on survey results. Overall, 31.5% (n=81) of patients qualified for high/intermediate-risk screening, risk reduction, and/or genetic assessment/testing based on the survey. For patients found to meet criteria for BC high/intermediate-risk services, 92.8% of patients were interested in referrals for additional information and care.

Conclusions: In our community, almost a third of patients undergoing breast imaging qualify for breast cancer high-risk assessment and services. The majority of patients expressed interest in pursuing such services. These data will be used in financial planning and resource allocation to further develop a high-risk program at our institution in line with NAPBC guidelines. We are hopeful that these efforts will ultimately improve oncologic outcomes and survival from breast cancer in our community.

Figure 1: Understanding breast cancer risk in a safety net hospital population: Proportion of patients qualifying for and interested in breast cancer high risk assessment for enhanced screening, risk-reduction, and/or genetics services per National Comprehensive Cancer Network Guidelines (Tyrer Cuzick v8) based on survey distributed over a 2-week interval of all patients with breast imaging appointments



1685641 - Utilizing Multigene Panel Tests for Cascade Testing Among Relatives of Probands with Breast Cancer Predisposition Pathogenic Variants Identifies Unexpected Findings in Relatives

Daniel Pineda-Alvarez[1], Sarah Nielsen[2], Emily Russell[2], Edward Esplin[2], Robert Nussbaum[2], Brandie Heald[3]

[1]Invitae Corp, Wellington, FL, [2]Invitae Corp, San Francisco, CA, [3]Invitae, Cleveland, OH

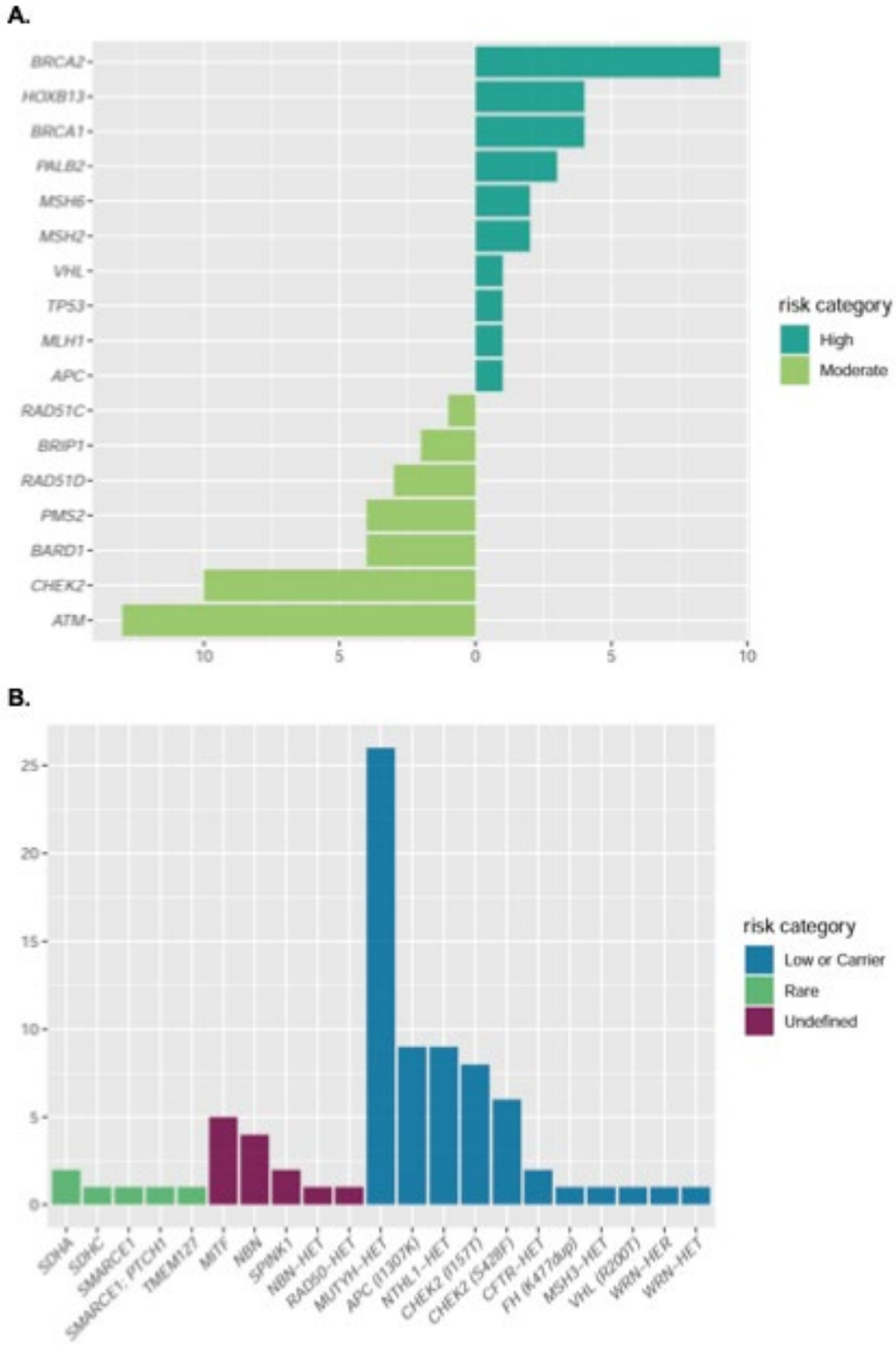
Background/Objective: Studies of relatives undergoing multigene panel testing (MGPT) for a familial pathogenic germline variant (PGV) are limited; one small study found that first-degree relatives (FDRs) undergoing cascade testing via a 30-gene panel had a 4.9% rate of unexpected findings (different PGV(s) than the proband; Caswell-Jin J et al 2019 JNCI). The aim of this study was to see if the above findings could be replicated in a larger cohort of relatives undergoing MGPT for a familial PGV.

Methods: Relatives undergoing clinician-ordered cascade testing for a familial PGV in a breast cancer predisposition gene at a single commercial laboratory were identified. Analysis was limited to those relatives undergoing a MGPT of ≥10 genes. The PGV(s) identified in the relative were compared to the proband's PGV(s). Demographics, relationship to proband, and cancer history data were pulled from test requisition forms; descriptive statistics, t test, and Fisher's exact test were utilized.

Results: Of 18,016 probands with at least one PGV in a gene related to breast cancer predisposition, 4,884 (27.1%) had at least one relative undergo cascade testing. Among these probands, 2,642 relatives underwent cascade testing via a clinician-ordered MGPT. Relatives were primarily female (77.8%), White (74.6%), and FDRs of the proband (71.6%), and 18.7% reported a personal history of cancer. Unexpected PGVs were identified in 159 (6.0%) relatives. This included 10 (0.4%) who were negative for the familial PGV but positive for a different PGV in the same gene as the proband and 105 (4.0%) who were negative for the familial PGV but positive for a PGV in a different gene than the proband. An additional 44 (1.7%) relatives tested positive for the familial PGV and were positive for an additional PGV in a different gene than the proband. Sex, age at testing, self-reported ethnicity, and personal cancer history were not associated with an unexpected finding, but being at least a second-degree relative ($p< 0.0001$) and panel size (mean 58.3 [SD 20.0] genes, unexpected PGV vs. 52.2 [SD 18.2] genes, no unexpected PGV, $p< 0.0001$) were. Among the 149 relatives with a PGV in a different gene, 28 (18.8%) were in a high-risk gene, 37 (24.8%) in a moderate-risk gene, 6 (4.0%) in a gene associated with rare cancer types, 13 (8.7%) in a gene with undefined cancer risk, and 65 (43.6%) with a low-risk or carrier finding. Based on the unexpected PGV(s), 50 (33.6%) relatives would potentially have qualified for different or additional cancer screening recommendations than the recommendations based on proband's PGV.

Conclusions: Among relatives undergoing cascade testing via a MGPT, unexpected results were found in 6.0%. Nearly 1 in 2 of these results were in high- or moderate-risk genes. Limiting cascade testing to only the familial PGV might result in missed, actionable findings for a subset of relatives.

Figure 1: Unexpected pathogenic germline variants identified in family members undergoing family variant testing via multigene panel testing in (A) high and moderate risk genes and (B) rare, undefined, and low risk genes or carrier findings.



1686519 - The ACTION Study: Addressing Global Inequities in Breast Cancer Genetic Testing, Counselling, and Management Among Breast Cancer Patients in Nigeria - A Healthcare Provider Educational Program

Funmilola Wuraola[1], Jenine Ramruthan[2], Emma Reel[2], Colleen Kerrigan[3], Michelle Jacobson[4], Andrea Covelli[5], Larissa Peck[2], Emily Thain[2], Jeanna McCuaig[6], Raymond Kim[2], Janet Papadakos[7], Danielle Rodin[2], Anna Dare[3], Nneka Sunday-Nweke[8], Olusegun Alatise[9], Tulin Cil[2]

[1]Obafemi Awolowo University Teaching Hospital, Ilorin, Kwara, Nigeria, [2]Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada, [3]University of Toronto, Toronto, ON, Canada, [4]Women's College Hospital, Toronto, ON, Canada, [5]Sinai Health System - Mount Sinai Hospital, Toronto, ON, Canada, [6]University of Toronto, Toronto, ON, Canada, [7]Cancer Health Literacy Research Centre, Toronto, ON, Canada, [8]Federal Teaching Hospital Abakaliki, Abakaliki, Ebonyi, Nigeria, [9]Obafemi Awolowo University Teaching Hospital, Ile-Ife, Osun, Nigeria

Background/Objective: Breast cancer is a significant health challenge in Nigeria, characterized by early onset, late-stage diagnosis (>80% with stage III/IV), and high prevalence of triple-negative tumors (~40%). In North America, genetic testing and counselling are widely available to evaluate the lifetime risk of breast cancer and inform subsequent management. A recent survey of Nigerian health care providers (HCPs) identified lack of knowledge and access as two main barriers to genetic testing. This study aims to develop and assess the effectiveness of a breast cancer genetics educational curriculum for Nigerian HCPs delivered through e-learning and in-person training. The results of this study will help to identify knowledge gaps for providers and strengthen understanding in delivering BRCA testing, counselling, and management for breast cancer patients in Nigeria.

Methods: From June to September 2023 a multidisciplinary, international team comprised of genetic counsellors, surgical oncologists, an obstetrician, and education experts convened virtually to develop a 4-modular curriculum focusing on Epidemiology, Hereditary Breast Cancer Principles, Communicating Genetic Test Results, and Clinical Management. Invitations were circulated to HCPs at tertiary hospitals across Nigeria. Thirty-nine HCPs participated in the study and allotted one month to complete the curriculum online on a Moodle-based platform. Thereafter participants were invited to in-person training session at the African Research Group for Oncology symposium in Nigeria. Altogether 25 HCPs participated both online and in-person, but only 19 completed all tasks for both training models. This study assessed knowledge scores by comparing responses to 10 standardized questions after receiving the complete training (online + in person).

Results: Participants demonstrated significant knowledge improvement across all modules (Figure 1). Module 1 had notable knowledge gain, with a 14.06-fold increase in interpreting incidence of breast cancer in Sub-Saharan Africa ($p = 0.0001$) and a 4.80-fold higher likelihood of understanding survival rate disparities between Nigeria and North American or European populations ($p = 0.0074$). In Module 2, participants demonstrated significant knowledge enhancement, with 7.65-fold, 16.20-fold, and 10.5-fold higher likelihoods of correctly answering questions related to BRCA1/BRCA2 mutations ($p = 0.0048$), risk of secondary breast cancer ($p = 0.02$), and genetic testing implications ($p = 0.0175$), respectively. In Module 3, participants displayed improved understanding in communicating variant of uncertain significance (VUS) genetic test results with a 23.80-fold higher likelihood of correctly addressing the action following a VUS discovery ($p = 0.0013$), with a positive trend towards comprehending VUS limitations and understanding a BRAC2 VUS result. Module 4 had considerable knowledge improvement with a 30.86-fold higher likelihood of identifying the tumor subtype of a BRCA1 carrier and an 11.56-fold higher likelihood of knowing the appropriate age for high-risk breast screening in women with a BRCA mutation ($p = 0.0011$, $p = 0.0003$, respectively).

Conclusions: Our study demonstrates the effectiveness of a hybrid training program to enhance understanding of breast cancer genetics among Nigerian HCPs. This collaborative effort underlines the importance of accessible education in shaping an equitable future for breast cancer patients worldwide.

Figure 1.

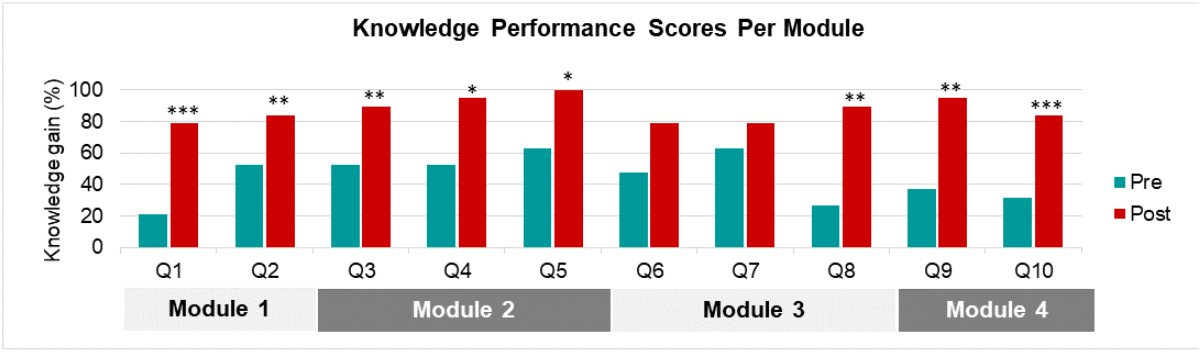


Figure 1: Knowledge performance scores per Module
Note: ** P value less than 0.05, ** P value less than 0.01, *** P value less than 0.001*
"Pre" denotes the participants' initial responses to the question online, "Post" represents their responses after completing the in-person training course.

1688416 - Differences in Germline Mutations and Overall Survival in Patients with De Novo vs Recurrent Metastatic Breast Cancer

Anna Louie[1], Samantha Thomas[2], Koumani Ntowe[1], Rani Bansal[3], Jennifer Plichta[1]

[1]Duke University Medical Center, Durham, NC, [2]Duke Cancer Institute, Durham, NC, [3]Duke University Medical Center, Raleigh, NC

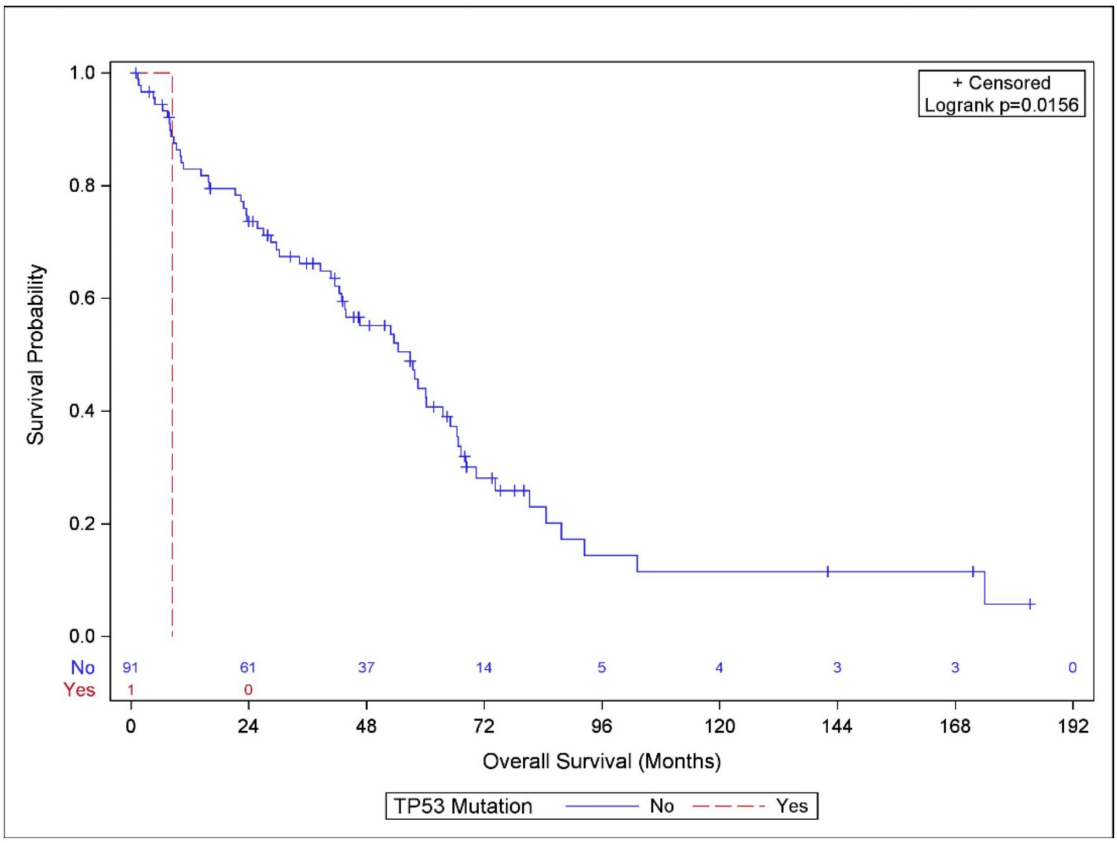
Background/Objective: De novo metastatic breast cancer (dnMBC) makes up 5-10% of initial breast cancer (BC) diagnoses. Additionally, 20-30% of localized BCs recur as distant metastatic disease (rMBC). While 10% of all patients with BC have germline genetic mutations that predispose them to BC, it is unclear if there are differences in prevalence or types of mutations between dnMBC and rMBC, and if there is an association with overall survival (OS).

Methods: Adult patients with dnMBC or rMBC who had undergone germline genetic testing were retrospectively identified from an institutional database at an academic medical center. Germline mutations in genes with a lifetime breast cancer risk >40% were classified as high penetrance (BRCA1, BRCA2, CDH1, PALB2, PTEN, TP53), while those with 20-40% lifetime risk were classified as moderate penetrance (ATM, BARD1, CHEK2, NF1, RAD51C, RAD51D, STK11). Differences were tested. Unadjusted OS was estimated using the Kaplan-Meier method (reported median/rate, 95% CI); log-rank tests were used to compare groups. Cox proportional hazards models were used to estimate the association of gene mutations with OS after adjustment for demographics, tumor, and treatment factors.

Results: Of 520 MBC patients, 308 (59.2%) had complete data: 92 dnMBC (29.9%) and 216 rMBC (70.1%). Median follow-up was 154.1 months (95% CI 137.9-180.8). Patients with dnMBC were significantly younger than those with rMBC (median 52yo vs 56yo, p=0.01). The groups were otherwise well matched on comorbidities, insurance status, marital status, race/ethnicity, number and distribution of metastatic sites, ER/PR/HER2 status, and clinical T/N categories. Among the 23 patients with rMBC and germline genetic mutations (n=23/216, 10.7%), 26 mutations were identified, compared to 12 mutations among the 7 patients with dnMBC and mutations (n=7/92, 7.6%; p=0.41). Mutations were identified in the following genes: BRCA1 (n=11, 3.6%), BRCA2 (n=7, 2.3%), TP53 (n=7, 2.3%), CHEK2 (n=3, 1%), PTEN (n=3, 1%), ATM (n=2, 0.6%), and PALB2 (n=1, 0.3%). Frequencies of each were similar for dnMBC and rMBC patients (all p>0.05). High penetrance mutations were twice as common in rMBC (10.2%) vs dnMBC (5.4%), although not statistically significant (p=0.18). In contrast, moderate penetrance mutations were more common among those with dnMBC (dnMBC 3.3% vs rMBC 0.5%, p=0.08). Despite treatment similarities, the unadjusted 5-year OS for dnMBC was 43.5% (95% CI 32.0-54.4%) vs 76.0% (95% CI 69.5-81.3%) for rMBC (log-rank p< 0.001). Among patients with dnMBC, the adjusted OS was similar for patients with and without BRCA1 or BRCA2 mutations (both p>0.05). However, the presence of a TP53 mutation was associated with worse OS before (median OS 8.4 vs 56.9 months; log rank p=0.02; Figure) and after adjustment (HR 12.51, 95% CI 1.09-143.83, p=0.04). Among patients with rMBC, there was no association between OS and the most common mutations (BRCA1, BRCA2, TP53; all p>0.05).

Conclusions: Within this cohort, germline genetic mutations were similar between patients with dnMBC and rMBC. Although survival outcomes were notably different, the presence of a mutation was not associated with altered survival, except for TP53 mutations in patients with dnMBC. Future studies with larger cohorts may clarify this association.

Figure and Table: Unadjusted overall survival by TP53 mutation status among patients with de novo metastatic breast cancer



TP53 Mutation	Total	Deaths (%)	Median OS (95% CI)	OS Rate (95% CI)			Log-Rank P-Value
				1-Year	3-Year	5-Year	
No	91	60 (65.9%)	56.9 (42.5-65.1)	0.829 (0.733-0.893)	0.662 (0.55-0.751)	0.44 (0.324-0.55)	0.02
Yes	1	1 (100%)	8.4 (NE-NE)	0 (0-0)	0 (0-0)	0 (0-0)	
Total	92	61 (66.3%)					

Median OS reported in months.
Abbreviations: OS=overall survival, CI=confidence interval, NE=non-estimable.

1688433 - Demographics and Clinical Decision Making in Patients with Germline Moderate Penetrance non-BRCA Mutations in Breast Cancer-related Genes

Koumani Ntowe[1], Samantha Thomas[2], Juliet Dalton[1], Ebunoluwa Olunuga[1], Ton Wang[3], Akiko Chiba[1], Jennifer Plichta[1]

[1]Duke University Medical Center, Durham, NC, [2]Duke Cancer Institute, Durham, NC, [3]Duke University Medical Center, Raleigh, NC

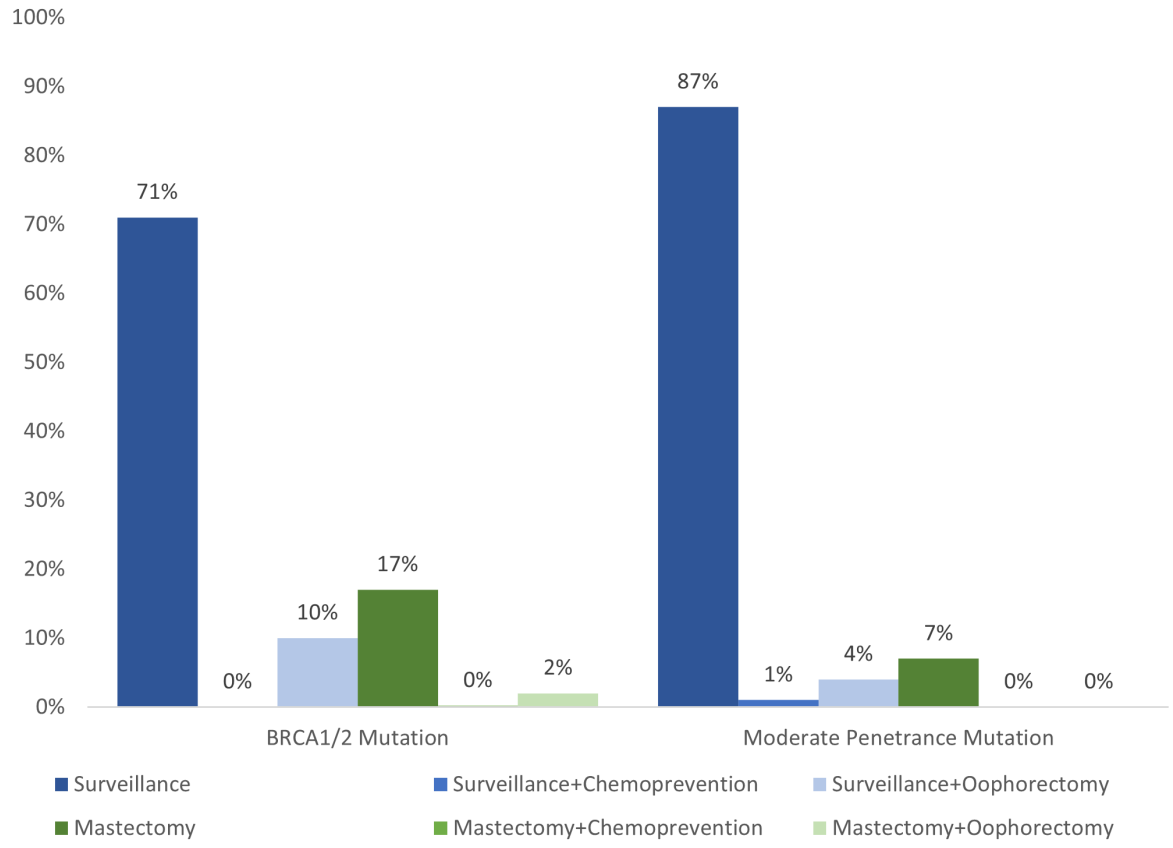
Background/Objective: There are numerous risk factors that affect breast cancer (BC) incidence and mortality, including, but not limited to, age, race, income, insurance status, reproductive patterns, breast density, and germline genetic mutations. Approximately 10% of BC cases are thought to be hereditary, with pathogenic mutations in high penetrance genes such as BRCA1 and BRCA2 being well studied. However, moderate penetrance mutations are under studied. In this study, we aim to compare risk reduction decision making patterns in patients without a prior BC diagnosis who are found to have a moderate penetrance BC-related genetic mutation.

Methods: Female patients age 18+ who tested positive for a pathogenic or likely pathogenic BRCA1/2 or moderate penetrance mutation related to BC between 1996 and 2023 were selected from a single academic center's database. Groups were stratified by mutation type (BRCA1/2 versus moderate penetrance mutation) and BC risk management (prophylactic mastectomy vs no mastectomy). Relevant germline genetic mutations were defined as BRCA1/2 mutations (BRCA1, BRCA2) or moderate penetrance mutations (ATM, BARD1, CHEK2, NF1, RAD51C, RAD51D). Surveillance was defined as patients who did not undergo mastectomy. Demographics and clinical outcomes were compared between groups.

Results: A total of 438 patients were included in the study, with 69% (n=304) of patients having a BRCA1/2 mutation and 31% (n=134) having a moderate penetrance mutation; the median follow-up was 3.7 years. The median age at genetic testing was 42 years old (IQR 31-52) in the BRCA1/2 cohort and 47 years old (IQR 37-60) in the moderate penetrance cohort ($p< 0.001$). Most patients opted for surveillance in both cohorts (BRCA1/2 80.9% vs moderate penetrance 92.5%), although some underwent mastectomy in both cohorts (BRCA1/2 19.1% vs moderate penetrance 7.5%) and management varied during the follow-up period (Figure). Compared to the BRCA1/2 cohort, patients with moderate penetrance mutations were more likely to be married/partnered and have private insurance (both $p< 0.05$). Patients in the moderate penetrance cohort were also more likely to choose surveillance, less likely to have a family history of BC and were less likely to have a subsequent diagnosis of malignancy (all $p< 0.05$). Within the moderate penetrance cohort, patients who chose to undergo prophylactic mastectomies were younger at the time of genetic testing and tended to have a higher number of family members with BC. In patients with moderate penetrance mutations, no association was found between the decision to undergo prophylactic mastectomy and race/ethnicity, sexual orientation, marital status, insurance status, smoking status, contraceptive use, or BMI.

Conclusions: We found notable differences in the age, marital status, and insurance type of patients without a history of or concurrent BC who were found to have a germline moderate penetrance mutation in a BC-related gene compared to those with a BRCA1/2 mutation. Additionally, we found associations between age at the time of genetic testing and number of family members with BC, and the decision to undergo prophylactic mastectomies in patients with moderate penetrance mutations. Our findings provide useful insights into the demographic makeup of patients with moderate penetrance mutations and those who pursue prophylactic surgery.

Figure 1: Risk reduction strategy by germline genetic mutation cohort



1688388 - Multigene Germline Testing in Patients with DCIS verses IBC in a Large Integrated Health Care System

Jessica Dzubnar[1], Sheng-Fang Jiang[2], Anna Vertido[3], Audrey Karlea[2], Elizabeth Hoodfar[2], Jonathan Svahn[2], Elizabeth Cureton[2], Laurel Habel[2], Veronica Shim[2]

[1]UCSF East Bay, Los Angeles, CA, [2]Kaiser Permanente, Oakland, CA, [3]UCSF East Bay, Oakland, CA

Background/Objective: Genetic testing eligibility guidelines continue to expand to include more age groups. We aimed to compare the frequency of germline pathologic variants (PV) and pathologic variants (LPV) between ductal carcinoma in situ (DCIS) and early invasive breast cancer (IBC) in a large integrated health care system to better understand the role of age in detection of breast cancer related (BCR) PV/LPV.

Methods: A retrospective cohort study of multigene panel germline testing (62 genes) among women with DCIS verses stage I-III IBC diagnosed between September 2019 through September 2022 was performed at Kaiser Permanente Northern California. We compared the rates of BCR and non-breast cancer related (NBCR) genes with PV/LPV between DCIS and IBC. BCR genes were considered to be those associated with high (BRCA 1, BRCA2, CHD1, PALB2, PTEN, STK11, TP53) and moderate (ATM, BARD1, CHEK2, NF1, RAD51C, RAD51D) breast cancer risk. Statistical analyses were performed using Fisher's exact tests and Chi-square analyses with $p < 0.05$ defining significance.

Results: 1,490 DCIS and 8,474 IBC patients were identified. The demographics and clinical features were similar between groups. The median age of diagnosis was 61 for DCIS and 62 years of age for IBC. Of the patients with DCIS, 329 (22.1%) were ≤50, 583 (39.1%) were 51-64, and 578 (38.8%) were ≥65 years of age. Of the patients with IBC, 1,979 (23.4%) were ≤50, 2,938 (34.7) were 51-64, and 3,557 (42%) were ≥65 years of age. 28.5% of DCIS (n=424) and 38.0% of IBC patients (n=3,223) underwent genetic testing. The median age for testing was 51 for DCIS and 52 years of age for IBC. Of the women with DCIS who underwent genetic testing, 87.7% were negative for PV/LPV (n=372), 6.1% had a BCR PV/LPV or (n=26), 6.1% had a NBCR PV/LPV (n=26). Of the women with IBC who underwent genetic testing, 85.5% were negative for PV/LPV (n=2757), 9.1% had a BCR PV/LPV or (n=249), 5.3% had a NBCR PV/LPV (n=172). Prevalence of BCR PV/LPV among patients with DCIS was 1.1% (n=16), 0.3% (n=5), and 0.3% (n=5) and rates among those with DCIS who underwent genetic testing were 3.8%, 1.2%, and 1.2% for age groups ≤50, 51-64, and ≥65 years of age accordingly. Prevalence of BCR PV/LPV among patients with IBC was 1.9% (n=162), 1.1% (n=90), and 0.5% (n=42) and rates among those with IBC who underwent genetic testing were 5.0%,2.8 %, and 1.3% for age groups ≤50, 51-64, and ≥65 years of age accordingly. There was no significant association between age group and pathology (DCIS verses IBC) among those with a BCR PV/LPV (p=0.45). In IBC patients with BCR PV/LPV, family history of cancer was significantly associated with the 51-64 age group (p=0.0065).

Conclusions: There were similar rates of BCR PV/LPV in patients with DICS compared to IDC with no significant association between age group and pathology (DCIS verses IBC). DCIS patients should be included in any expansion of the multigene germline genetic testing guideline by age in early breast cancer.

Figure 1: Rates of breast cancer and non-breast cancer-related PV/LPV among

1681617 - Surgical Choice Among Breast Cancer Patients with Breast Cancer Susceptibility Genes

Ashley Cairns[1], Nori Richen[2], Audry Sebikali-Potts[2], Thuy Vu[2], Marissa Howard-McNatt[1]

[1]Wake Forest Baptist Health, Winston-Salem, NC, [2]Atrium Wake Forest Baptist Health, Winston-Salem, NC

Background/Objective: The Society of Surgical Oncology (SSO) Executive Council has stated that "known mutation such as BRCA 1/2 or other strongly predisposing breast cancer susceptibility genes" can justify proceeding with a bilateral prophylactic mastectomy or contralateral prophylactic mastectomy (CPM). However, there is little data on CPM rates among those with pathogenic or likely pathogenic (P/LP) variants in breast cancer susceptibility genes. As such, we aim to investigate rates of CPM amongst breast cancer patients with P/LP variants in breast cancer susceptibility genes and compare surgical choice across genotype.

Methods: We performed a retrospective study of patients who were diagnosed with breast cancer who were identified to have P/LP variants on genetic testing in 8 high-penetrance breast cancer susceptibility genes at a single institution from 2015-2022. Statistical analysis was performed with T-test, Chi-squared test, and Mann-Whitney U-test, p=0.05 with two-tails.

Results: From 2015-2022, 133 breast cancer patients were identified to have actionable genetic variants which confer susceptibility to breast cancer. Most patients were female 99.3% (n=132). The age range was 26-72 years old. Most patients were non-Hispanic, white 83.5% (n=111), Hispanic, white 6.0% (n=8), Black 5.3% (n=7), and Asian 0.75% (n=1). 48.1% or 64 patients were identified to have P/LP variants in either BRCA1 (27) or BRCA 2 (37). Other P/LP variants identified were in ATM 21.1% (n=28), CHEK2 17.3% (n=23), PALB2 8.2% (n=11), STK11 2.2% (n=3), TP53 2.2% (n=3), and PTEN 0.75% (n=1). Amongst all P/LP variant carriers, more than half of the patients elected for bilateral mastectomy at 58.6% (n=78) with the main indication for contralateral prophylactic mastectomy. Other surgical choices included breast-conserving surgery at 26.3% (n=35) and unilateral mastectomy at 15.0% (n=20). Interestingly, there was a statistically significant different rate of CPM amongst those with CHEK2 and ATM P/LP variants as compared to BRCA 1/2 P/LP variants. Of note, 39.1% of breast cancer patients with CHEK 2 P/LP variants selected CPM (p=0.0083) and 42.9% of breast cancer patients with ATM P/LP variants selected CPM (p=0.012) when compared to 70.3% of breast cancer patients with BRCA 1/2 P/LP variants selecting CPM. Patients who selected bilateral mastectomies were younger at 46.6 +/-11.1 years old when compared to other surgical choices at 60.0 +/- 11.6 years old (p< 0.00001). Overall, black patients are less likely to have bilateral mastectomies 42.9% (n=3) when compared to 58.2% (n=64) amongst white breast cancer patients and 87.5% (n=7) in Hispanic breast cancer patients; although no differences were statistically different.

Conclusions: Our data suggests that CPM is performed in roughly half of breast cancer patients with a known genetic predisposition. We identified that age and certain genetic variants (BRCA1/2 and PALB2) are associated with selection of bilateral mastectomies. Our study provides valuable insight into surgery preferences among women with different types of genetic variants. Future research should investigate possible contributing factors such as race in selection of bilateral mastectomy amongst those with breast cancer susceptibility genes.

1674209 – Real-world Breast Surgery Utilization Among Breast Cancer Patients with Germline Variants of Uncertain Significance

Kevin Hughes[1], Sarah Nielsen[2], Emily Russell[2], Flavia Facio[2], Chad Moretz[2], Brandie Heald[2], Rachel Ellsworth[2], Peter Beitsch[2], Daniel Pineda-Alvarez[3], Edward Esplin[2], W. Michael Korn[2], Robert Nussbaum[2], Allison Kurian[4]

[1]Medical University of South Carolina, Charleston, SC, [2]Invitae Corporation, San Francisco, CA, [3]Invitae Corp, Wellington, FL, [4]Stanford University School of Medicine, Stanford, CA

Background/Objective: Germline multigene panel testing (MGPT), which includes genes that can directly inform surgical, medical and surveillance strategies for breast cancer (BC) risk-reduction and treatment, has become the standard of care for diagnosing hereditary cancer predisposition. Although MGPT can lead to high rates of variant of uncertain significance (VUS) results, receipt of a VUS should not impact clinical management. Conflicting results have been reported regarding whether patients with VUS have higher levels of healthcare utilization, particularly breast surgeries,

compared to those with negative results. This study examines breast surgery uptake in a large, recent sample of BC patients undergoing MGPT.

Methods: A linked dataset of germline genetic testing (GGT) data (Invitae Corporation) and insurance claims data (Komodo Healthcare MapTM) was assembled for female patients with ICD-10 code(s) for BC between 2015 and 2023, GGT within 120 days of diagnosis, CPT code(s) for breast surgery and > 12 months continuous enrollment pre- and post-GGT. Analyses were restricted to the post-GGT period. Patients with bilateral BC, distant metastasis, and unilateral mastectomy (UM) or bilateral mastectomy (BLM) prior to GGT were excluded. Genes of interest were those conferring high (>50%; BRCA1, BRCA2, CDH1, PALB2, PTEN, TP53) or moderate (20-50%; ATM, BARD1, CHEK2, NF1, STK11, RAD51C, RAD51D) lifetime BC risk. GGT results: positive (> 1 pathogenic germline variant [PGV]), VUS (no concurrent PGV) or negative. Chi-square and two sample t-tests were used; significance was set at $p< 0.05$. Logistic regression was used to correct for confounding factors, including ethnicity, age at diagnosis, family history, lymph node status and time from diagnosis to GGT. GGT results were included in the model with negative as the reference value.

Results: The study sample included 9,971 female patients (1,054 VUS, 8,296 negative and 621 positive), characterized by: 68% White, 17% Non-White (Asian, Black, or Hispanic), 22% with lymph node involvement, 65% with family history of cancer, 73% commercial insurance, mean (SD) age at testing: 53 (11) and mean (SD) days from diagnosis to GGT: 31 (19). The characteristics of patients with VUS and negative results were similar, except that patients with VUS were significantly more likely to be non-White and have a longer time from diagnosis to GGT ($p< 0.0001$). The odds of breast conserving surgery (BCS), UM, BLM and breast reconstruction, were not significantly different between patients with uncertain and negative results (Table). In contrast, positive patients with positive results had 4.5 greater odds than negative patients of receiving BLM. Accordingly, the odds of undergoing breast reconstruction surgery were 2.2-fold higher in positive compared to negative patients (Table).

Conclusions: This study demonstrates that in a real-world sample of >9,000 breast cancer patients, receipt of breast surgical procedures by patients with VUS results did not differ significantly from patients with negative results. These results offer reassurance that VUS results do not appear to prompt guideline-discordant use of mastectomy for breast cancer treatment in contemporary practice.

Table 1: Uptake of BC-related procedures and therapies stratified by GGT result

	Negative (reference)	VUS			Positive		
Procedure	**N (%)**	**N (%)**	**OR (95% CI)**	**P-value versus Negative**	**N (%)**	**OR (95% CI)**	**P-value versus Negative**
BCS	4,263 (51.4)	513 (48.7)	0.9 (0.8-1.0)	0.146	159 (25.6)	0.4 (0.3-0.4)	**$<2x10^{-16}$**
UM	2,514 (30.3)	339 (32.2)	1.1 (0.9-1.2)	0.378	136 (21.9)	0.6 (0.5, 0.7)	**$2.6x10^{-6}$**
BLM	1,594 (19.2)	215 (20.4)	1.1 (0.9, 1.3)	0.295	330 (53.1)	4.5 (3.8, 5.4)	**$<2x10^{-16}$**
Breast reconstruction	2,457 (29.6)	321 (30.4)	1.0 (0.9-1.2)	0.638	316 (50.9)	2.2 (1.9-2.7)	**$<2x10^{-16}$**

BCS, breast-conserving surgery; UM, unilateral mastectomy; BLM, bilateral mastectomy
Adjusted for ethnicity, age at diagnosis, family history, locally advanced disease and time from BC diagnosis to GGT.

1688327 - Trends in Genetic Testing for Breast Cancer Patients After Implementation of Genetics Referral for All Breast Cancer Patients

Hemi Thaker[1], Jessica Bensenhaver[1], Christine Joliat[2], Erika King[1], Anne Patterson[3], Theresa Schwartz[1], Laura Dalla Vecchia[1], Laura Susick[1], Lindsay Petersen[1], Anna Lehrberg[1]

[1]Henry Ford Health, Detroit, MI, [2]Henry Ford Health, Wyandotte, MI, [3]Wayne State University, School of Medicine, Detroit, MI

Background/Objective: National guidelines for genetic testing in breast cancer patients have recently changed to encourage discussion of and allow for testing in all patients, regardless of tumor biology or family history, based on American Society of Breast Surgeons statement in 2019. The aim of this study was to evaluate genetic referral patterns after the 2019 recommendations and to identify possible barriers to testing completion.

Methods: We used our institutional IRB-approved prospective breast cancer database to evaluate invasive breast cancer patients seen in our multi-disciplinary clinic (MDC), who were referred for genetic counseling and testing from 2017 through 2022. Collected data points included patient race, referral placed, days between referral and scheduled genetic counseling appointment, completion of consultation, completion of genetic testing.

Results: Between 2017 and 2022, there were 2,204 women seen in our MDC who consented to our database registry and 1,485 were referred to genetics. We saw a significant increase in the number of genetics referrals in patients with invasive breast cancer after 2019—62% from 2017 to 2019 compared to 72% from 2020-2022 ($p< 0.0001$). The rate of genetic consultation completion increased—76% from 2017-2019 compared to 86% from 2020-2022($p< 0.0001$). There was a significant decrease in the number of patients who were recommended for testing after genetic counseling—90% from 2017-2019 compared to 79% from 2020-2022($p< 0.0001$)— and in the number of patients who completed genetic testing—94% from 2017-2019 compared to 88% from 2020-2022($p=0.0019$). The interval, in days, between genetics referral and counseling appointment was significantly associated with the genetic testing completion rate. A longer interval between genetics referral and counseling appointment resulted in a lower testing rate among those recommended for testing, $p< 0.0001$. Although there was a significant increase in genetic referral rates after the 2019 testing recommendations, this did not have a significant effect on rates of testing between the years before 2019 and after; between 2017-2019 and 2020-2022 ($p=0.0582$). A univariate analysis was done by race between the two largest groups in our cohort, Caucasian women (CW, n=921) and Black women (BW, n=448). BW had higher rates of not completing consultation compared to CW (32% vs 26%), however this was not significant ($p=0.4617$). Furthermore, in women who completed consultation, CW had higher rates of testing compared to BW (91% vs 86%), although not statistically significant($p=0.5962$). Additional races were identified in the cohort, and more diverse patients completed testing after 2019, but the power was too low for statistical analysis.

Conclusions: Since the guidelines for genetic testing in patients with invasive breast cancer changed in 2019, we found a significant increase in the genetics counseling referral rate and genetic testing rate at our institution. A longer interval between the genetics referral order and the counseling appointment had a significant effect on the genetic testing completion rate, and has become a target for improvement. Although not significant, the discrepancy trend toward consultation and testing completion for BW is worth noting and a second target for improvement. Further investigation into barriers hindering a timely genetic counseling appointment is warranted.

Table 1. Univariate analysis by race of genetic testing completion rate

Year	Referred / Full Cohort	Tested / Recommended for Testing (full cohort)	Caucasian (tested/ recommended for testing)	Black (tested/ recommended for testing)
2017	64% (174/274)	94% (115/119)	93% (71/76)	90% (38/42)
2018	59% (222/376)	96% (144/150)	97% (99/102)	95% (37/39)
2019	62% (239/386)	89% (149/167)	92% (95/103)	86% (43/50)
2020	70% (145/208)	82% (85/104)	88% (56/64)	71% (27/38)
2021	70% (345/495)	88% (199/225)	87% (132/152)	88% (59/67)
2022	77% (360/465)	89% (226/253)	92% (145/158)	86% (49/57)

1623576 - Mastectomy or Breast-conserving Surgery in Young Gene Mutation Carriers with Breast Cancer: Psychosocial Outcomes from the Patient's Perspective

Christine Wang[1], Melissa Wood[1], Yuan Xu[1], Flora Yang[2], Susan Isherwood[2], May Lynn Quan[1]

University of Calgary, Calgary, AB, Canada

Background/Objective: In young gene mutation carriers with breast cancer, there is a lifetime risk of contralateral primary or recurrence after breast conserving surgery (BCS) which may lead women to pursue bilateral mastectomies. The surgical decision-making process, and potential psychosocial impacts of this decision are not well understood. Our aim was to understand factors that influence receiving a mastectomy compared to breast conserving surgery (BCS) in this population, and their psychosocial impact with a focus on genetic mutation status.

Methods: The prospective RUBY cohort of Canadian women < 40 newly diagnosed with breast cancer was queried. Patient reported demographics, surgical treatment, anxiety (GAD), depression (PHQ9) and psychosocial well-being (BREASTQ) were collected at diagnosis and post treatment. Chart reviews were completed on all patients to collect further tumor and nodal characteristics. Descriptive statistics, univariable analysis with Chi Square tests, and t tests were completed. Multivariable logistic regression was performed to determine associations between patient factors and choice of breast surgery. For multivariate analyses patients with tumor size over 5cm, or multicentric tumors were excluded.

Results: 700 women were included in the cohort, of which 24% had a genetic mutation (34% BRCA1 mutation, 22% BRCA2, 3% both, 28% other, 9% VUS, 4% non-breast cancer-related). 38% of the cohort received BCS and 62% had a mastectomy. Gene mutation carriers tended to be younger (median age 35 vs 37, $p< 0.001$), have a positive family history (23% vs 12% $p=0.002$), have triple negative histology (33% vs 16%, $p< 0.001$), and have a greater chance of receiving a mastectomy compared to BCS (83% vs 56%, $p< 0.001$). Women with a genetic mutation had worse psychosocial well-being and breast satisfaction scores (BREASTQ) post treatment, compared to the non-mutation women (55.8 vs 63.1, $p< 0.001$ and 54.1 vs 59.5 $p< 0.001$ respectively), with no difference in pretreatment scores (58.6 vs 61.7, $p=0.067$ and 58.8 vs 59.1, $p=0.155$). On multivariable analysis (Table 1), women with a genetic mutation had an OR of 4.28 for receiving a mastectomy, compared to non-gene mutation women ($p < 0.000001$). Additional factors associated with mastectomy were lower education level, not having a strong preference for breast conservation, and multifocal tumors.

Conclusions: In young women with breast cancer, genetic mutation status increases the chance of receiving a mastectomy and the post treatment psychosocial outcomes for these women are worse compared to those who do not have a mutation. Lower education levels and lack of a preference for breast conservation was associated with mastectomy, which highlights the opportunity clinicians have, to ensure their pre-treatment counselling considers the psychosocial impact of mastectomy in this population.

Table 1: Multivariable analysis: Factors in receiving a mastectomy compared to breast-conserving surgery

Characteristic	Odds Ratio	Confidence Interval	p value
Age at Diagnosis	0.99	0.94-1.04	0.58
Ethnicity, Mother			
Caucasian	Reference		
Non-Caucasian	1.54	0.67-3.54	0.31
Unknown	0.95	0.28-3.29	0.94
Genetic Mutation Status			
Non-Mutation	Reference		
Gene Mutation	4.54	2.68-7.70	**<0.000001**
VUS	0.57	0.15-2.07	0.39
Family History of Breast Cancer			
No	Reference		
Yes	1.57	0.81-3.04	0.18
Education Level			
High School	Reference		
College	0.40	0.19-0.81	**0.011**
University	0.49	0.25-0.96	**0.037**
Graduate Studies	0.43	0.21-0.88	**0.021**
Breast Cancer knowledge			
None/Limited	Reference		
Good	1.64	1.06-2.53	**0.027**
Excellent	2.54	0.83-7.75	0.10
Attitudes Towards Breast Surgery			
Wanted to Preserve Breasts	Reference		
Wanted Both Breasts Removed	9.74	5.18-18.34	**<0.000001**
Wanted Breast Removed	6.64	2.97-14.86	**0.000004**
No Opinion	2.4	1.49-3.86	**0.0003**
BREASTQ Breast Satisfaction (Pre)	0.99	0.97-1.00	**0.028**
BREASTQ Psychosocial (Pre)	1.02	1.00-1.03	**0.046**
Anxiety (Pre)	1.02	0.97-1.07	0.55
Depression (Pre)			
Clinical Depression	Reference		
No depression	1.05	0.63-1.76	0.84
Tumor <2cm	Reference		
Tumor 2-5cm	1.37	0.97-2.05	0.12
Node Negative	Reference		
N1-3	1.33	0.84-2.11	0.22
Unifocal Tumor	Reference		
Multifocal Tumor	1.7	1.04-2.78	**0.034**
Tumor Subtype			
Triple Negative	Reference		
ER/PR+ HER2-	0.99	0.58-1.69	0.97
HER2+	1.00	0.55-1.8	0.99

1657944 - Machine Learning Models Impact in Reducing Variants of Uncertain Significance in Individuals Undergoing Genetic Testing for Breast Cancers

Daniel Pineda-Alvarez[1], Brandie Heald[2], Sarah Nielsen[2], Edward Esplin[2], Britt Johnson[2], Laure Fresard[2], Yuya Kobayashi[2], Jason Reuter[2], Keith Nykamp[2], Swaroop Aradhya[2]

[1]Invitae Corp, Wellington, FL, [2]Invitae Corporation, San Francisco, CA

Background/Objective: The classification of missense variants is challenging due to limited evidence. Consequently, many remain categorized as variants of uncertain significance (VUS). VUS are at the core of healthcare disparities, as individuals from racial, ethnic and ancestral (REA) populations underrepresented in large genomic databases and medical literature receive VUS more often. To generate definitive germline genetic results more equitably across REA groups, we sought to develop gene-specific machine learning (ML) models and evaluate their utility in genetic testing for individuals with breast cancer.

Methods: From 1/1/2022-5/22/2023, gene-specific ML algorithms (including existing models such as SpliceAI and lab-developed models that leveraged large datasets including gnomAD, AlphaFold protein structures, and others, to model variant effects) were validated and integrated at a single commercial laboratory. Evidence from these ML models were incorporated into Sherloc, a semi-quantitative variant interpretation framework based on ACMG/AMP guidelines. Only evidence that met a negative or positive predictive value >80% was incorporated during variant interpretation. At least 1 validated model was available for 158 genes during the study period. VUS reduction was calculated, stratified by REA groups. Analyses of >20,000 patients were performed from random sampling of 20,000 patients with extrapolation. Measurement error was less than 2% variation by bootstrapping.

Results: Of 189,363 (32% from an underrepresented REA group) individuals from the United States who underwent multigene panel testing for cancer, ~119,200 (63%) had ML evidence applied to ≥1 variant. Models contributed to definitive classification of ≥1 benign/likely benign variant in ~38,500 (~20%) individuals and ≥1 pathogenic/likely pathogenic variant in ~1,300 (0.7%) individuals. A significantly higher percentage of Black, Asian, and Hispanic individuals who had a history of breast cancer (22%, 28%, 19%, respectively) had a definitive classification that was dependent on ML evidence compared to White individuals (12%, Table).

Conclusions: Among individuals with breast cancer who had ≥1 VUS with ML evidence applied, >20% resulted in a definitive variant classification. ML modeling has demonstrated utility during clinical variant interpretation for cancer, particularly in underrepresented populations, which can help reduce the burden to clinicians and patients of identifying a VUS on germline genetic testing.

Table 1: Machine learning model contribution to definitive variant classification stratified by cancer type and clinician reported race and ethnicity

Cancer history	Clinician-reported REA group	Definitive classification n* (%)	B/LB n (%)	P/LP n (%)	*p*-value †
Any type	Any^	4187 (21)	4076 (20)	142 (1)	
	Asian	3100 (35)	3053 (34)	76 (1)	**8.90E-223**
	Black	3876 (29)	3825 (29)	89 (1)	**1.89E-142**
	Hispanic	5893 (32)	5777 (31)	230 (1)	**1.85E-235**
	White^	3510 (18)	3403 (17)	150 (1)	
Breast	Any^	3031 (15)	2983 (15)	57 (0)	
	Asian	1091 (28)	1073 (27)	21 (1)	**1.95E-139**
	Black	1175 (22)	1159 (21)	19 (0)	**9.38E-73**
	Hispanic	1132 (19)	1118 (19)	21 (0)	**7.37E-42**
	White^	2429 (12)	2371 (12)	61 (0)	

Abbreviations: B/LB, benign/likely benign; P/LP, pathogenic/likely pathogenic; REA, race, ethnicity and ancestry

*some individuals might have >1 variant that was impacted by machine learning

† one-tailed, two-sample proportion test compared to individuals who were clinician-reported White

^analysis limited to sampled pool of 20,000 individuals

1688040 - Increasing the Rate of Cascade Genetic Testing in At-risk Family Members Through Participation in a Hereditary Cancer Clinic

Denise Garcia, Nathaniel Oberholtzer, Kiersten Meeder, Jennifer Diaz, Andrea Abbott, Kevin Hughes

Medical University of South Carolina, Charleston, SC

Background/Objective: As cancer genetic testing has markedly increased, many more patients with pathogenic variants are being identified. These patients are at increased risk for multiple cancers and and need intensive screening and surgical management. In addition, there are significant implications for other family members who may also be at risk. Cascade testing (CT) could improve genetic testing to these at-risk relatives and amplify the potential for early detection. Unfortunately, cascade testing is grossly under-utilized. A Hereditary Cancer Clinic (HCC) can both provide a central location to arrange and monitor management of carriers and potentially maximize CT. The purpose of this study was to assess the rate of CT of at-risk family members evaluated at an HCC versus standard of care (non-HCC) and how those might correlate with patient gender, age, and race.

Methods: This is a single center, IRB exempted for quality improvement, retrospective review of patients diagnosed with a pathogenic variant between January 2022 and July 2023. The number of families where any cascade testing was done (CT group) and the number of relatives tested (rate of CT) was evaluated by gender, age, race and whether patients were evaluated at an HCC or not. Significance was determined by T-Test for numeric values and Pearson's Chi-squared for categorical values.

Results: We identified 383 patients with newly diagnosed pathogenic variants. 195 (50.9%) of patients were seen at an HCC which includes visit with genetic counselor and dedicated nurse practitioner while 188 (49.1%) of patients had standard of care genetic counseling through their Primary Care Provider or Specialist at a non-HCC. Of the 195 HCC patients, 111 (59.4%) had at least one family member tested, while only 76 (40.6%) of the 188 non-HCC patients had at least one family member undergo testing ($p< 0.05$). With similar numbers of patients in each group, 1.5 times as many family members were tested in the HCC group (286) vs the non-HCC group (188). On average, 1.47 family members underwent genetic testing per HCC patient, while only 0.89 family members underwent genetic testing per non-HCC patient. Observation of factors related to cascade testing identified that patients within the CT group were significantly younger with a mean age of 48.8 years old (median 46 years) than the patients within the non-CT group whose mean age was 52.3 years old (median 53 years) ($p< 0.05$). There were no significant differences in gender or race noted between CT and non-CT groups.

Conclusions: Compliance with cascade testing remains low, and new methods must be developed to increase this critical approach. Evaluation at a hereditary cancer clinic correlated with significant increase in both rate of cascade testing and number of relatives tested per patient. These results demonstrate an additional benefit of a dedicated hereditary cancer clinic at medical centers.

Table 1: Characteristics of patients whose family members underwent cascade testing (CT group)

	Patient population	Number of patients seen	Patients with ≥1 relative tested (CT group)	Number of family members tested	Family members tested per patient
Clinic Setting	HCC	195 (50.9%)	111 (59.4%)	286	1.47
	Non-HCC	188 (49.1%)	76 (40.6%)	188	0.89
	Significance	-	*p=0.0026	-	*p=0.0347
Race	Black /African American	57 (15%)	23 (40%)	44	0.77
	White	305 (80%)	153 (50%)	389	1.28
	Significance	-	p=0.173	-	p=0.054
Gender	Female	311	156 (50%)	383	1.23
	Male	72	31 (43%)	70	0.97
	Significance	-	p=0.278	-	p=0.273

1688318 - Multispectral Imaging: A Precision Tool in Margin Assessment in Breast-conserving Surgery

Dhurka Shanthakumar[1], Maria Leiloglou[1], Vadzim Chalau[1], Paul Thiruchelvam[2], Ara Darzi[1], Daniel Elson[1], Daniel Leff[1]

[1]Imperial College London, London, England, United Kingdom, [2]Imperial College Healthcare NHS Trust, London, England, United Kingdom

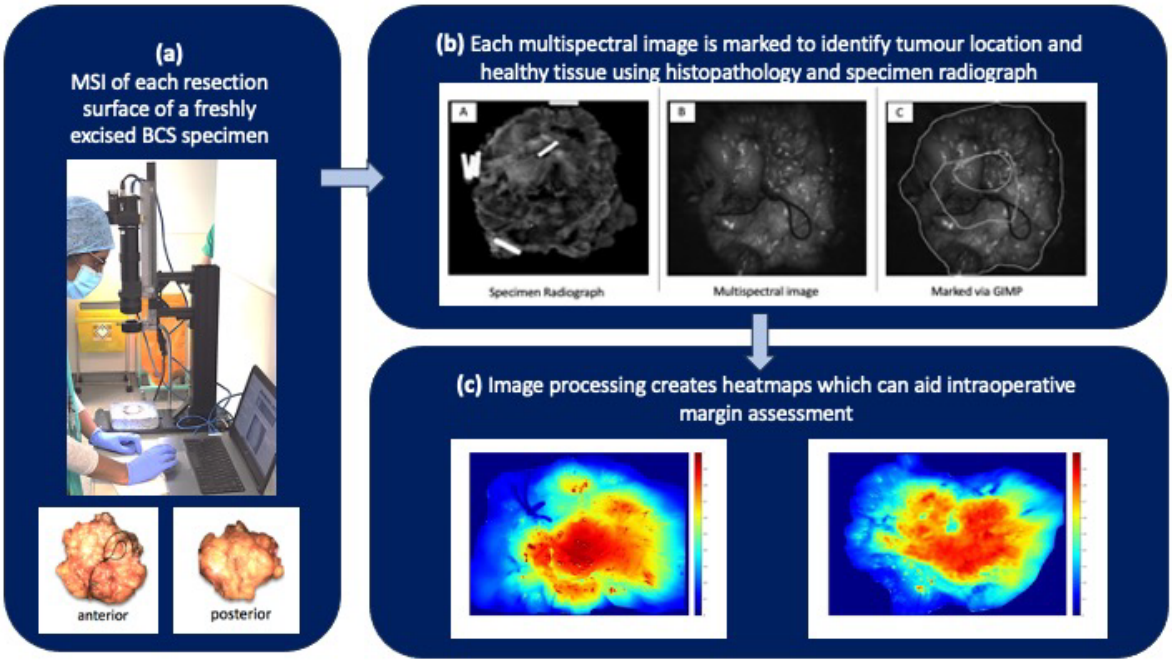
Background/Objective: Breast conserving surgery (BCS) has quality of life benefits over mastectomy in the management of early-stage breast cancer. However, re-excision due to positive margins is a common problem after BCS. Current margin assessment techniques preclude full assessment of the resection surface in real time. Multispectral imaging (MSI) is a non-invasive and non-ionizing method for extracting tissue optical properties and rapidly characterising tissues. The objective was to assess the diagnostic accuracy of a custom-built MSI camera for breast cancer detection, towards intra-operative margin assessment.

Methods: Patients undergoing BCS were recruited to a single centre prospective feasibility study (IRB= 08/H0719/37). Multispectral images were acquired from each resection surface of freshly excised BCS specimens (Figure 1a). Intraoperative radiography and gold standard histological analysis were used to extract ground truth tissue characterisation (Figure 1b). Linear Discriminant Analysis (LDA) and Logistic Regression were implemented for dimensionality reduction and pixel-dense classification, respectively. 5-fold cross validation with Receiver Operating Characteristics (ROC) analysis extracted the diagnostic accuracy.

Results: 48 patients with mean (range) age 59.8 (27 – 80) years, and median (range) body mass index 27.2 kg/m2 (19.9 – 39.8). Lesion histological subtypes varied, as follows: invasive ductal carcinoma (61%); ductal carcinoma in-situ (17%); invasive lobular (9%); other (13%). Only 2 patients had received neoadjuvant chemotherapy. Receptor status of the invasive lesions were as follows: 88% were ER+ PR+ HER2-; and only 6% had ER+ PR- HER2 – or triple negative disease respectively. The MSI camera allows separate analysis of images per narrow band within the visible (VIS) to near-infrared (NIR) range. NIR light can potentially penetrate tissue up to depths of 3mm, therefore image analysis was conducted on resection surfaces where tumour was noted at this depth. 6 specimens were also excluded due to gross contamination with blue dye or poor image quality due to technical issues. Therefore, 23 specimens were included for final analysis, 38 surfaces were marked where tumour was < 3mm from the surface. The mean lesion size within specimens was 16.25 mm (range 6 – 35). Following image analysis, 5-fold cross validated resulted in 89.2% accuracy (SD: ±0.067), 85.6% (SD: ±0.116) sensitivity and 80.9% (SD: ±0.080) specificity.

Conclusions: MSI is a potential intraoperative margin assessment technology to aid surgical decision making. This study suggests that MSI may be capable of distinguishing normal and malignant breast cancer tissues in-vivo. Compared to other margin assessment systems MSI provides immediate visualisation of involved resection surfaces. Only 23 specimens were assessed here as it is known blue dye affects spectral readings. Therefore, MSI systems must adapt to account for a changing landscape of different agents/dyes for axillary staging. Future work will focus on image analysis using varying machine learning classifiers, as speed and accuracy are crucial to surgical workflow.

Figure 1: Schematic highlighting intraoperative MSI use (a) and image marking utilising specimen radiography as reference prior to pre-processing (b), with examples of "heatmaps" (graphical representation of the probability of a region of interest being tumour or normal tissue) (c).


(a)
MSI of each resection surface of a freshly excised BCS specimen
anterior
posterior
(b) Each multispectral image is marked to identify tumour location and healthy tissue using histopathology and specimen radiograph
A
B
C
Specimen Radiograph
Multispectral image
Marked via GIMP
(c) Image processing creates heatmaps which can aid intraoperative margin assessment

1689029 - Automatic 3D Segmentation and Longitudinal Volumetric Measurement of Breast Lesions for Automated Breast Ultrasound Images

Shadi Saberi, Andrew Leynes

iSono Health, Inc., South San Francisco, CA

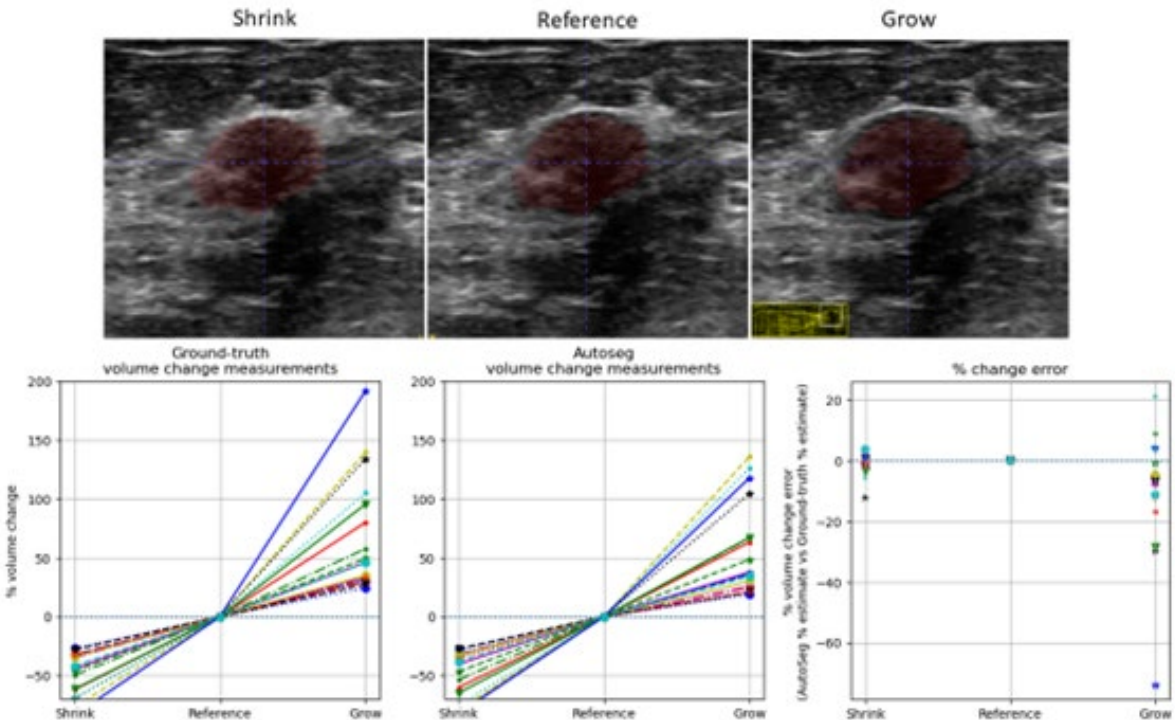
Background/Objective: Automated Breast Ultrasound enables 3D volume acquisition and volumetric measurement of the lesions which is more accurate and reproducible than 2D ultrasound measurements specifically for pre-operation planning and longitudinal monitoring for patients going through neoadjuvant treatment. However, it lengthens the time required for image interpretation and lesion annotation and measurement due to the large number of volumetric slices. We developed an AI-based 3D segmentation model to automatically measure the volume of a detected breast lesion precisely and reproducibly.

Methods: A portable 3D automated breast ultrasound system was used to image 64 breast volumes with biopsy-confirmed findings. Breast lesions were localized and cross-sectional contours were segmented in the 3D reconstructed volume by a breast radiologist with >30 years of experience. The segmentations were completed by an ultrasound researcher with 5 years experience. The dataset was split into training and test sets with the following proportions: 54 breast volumes with 111 lesions for training, and 10 breast volumes with 18 lesions for final volumetric measurement testing. An automatic segmentation network (3dAutoSeg) was developed and was trained on a subset of the training dataset (80% and 20% for training and validation). A simulated longitudinal study was conducted by modifying the size of the lesions in the test set (shrinking or growing) using ground-truth masks. The top row of the figure shows an example of the deformations applied. Longitudinal volume tracking error was then measured by calculating the difference between the percentage change measured using ground-truth masks and the percentage change obtained from the masks produced by 3dAutoSeg.

Results: The final 3dAutoSeg segmentation model achieved an average Dice score of 0.78 +/- 0.04 (mean +/- st.dev.) on the test set of 18 lesions. The minimum Dice score observed was 0.72, while the maximum reached an outstanding 0.86. On single time-point volumetric lesion measurement, 3dAutoSeg exhibited an overall error of -12% +/- 15% ($n=54$, $p< 0.00001$, Wilcoxon signed-rank test) when compared against the volume measurements from the ground-truth segmentation masks. The bottom row of the figure shows the % volume change and tracking error for the simulated deformations. When tracking volume changes, 33 of 36 cases can be reliably tracked within a 20% margin. The three lesions with a volume tracking error of >20% had much larger volume growth (+192%, +135%, +95%, respectively). In all cases, the shrinking and growth trends were preserved when using 3dAutoSeg.

Conclusions: We developed a 3D Segmentation model to accurately and automatically measure lesion volumes on automated 3D breast ultrasound images. We demonstrated that our model evaluated on simulated longitudinal data can reliably detect clinically significant volumetric changes in breast lesions.

Figure 1: A simulated longitudinal study of lesion change in size and the percentage volume change and tracking error rate measured by AutoSeg3D



1686169 - A Prospective Single-arm Clinical Trial Evaluating Dedicated Breast PET Using [F-18]fluoroestradiol for the Pre-operative Evaluation of Invasive Lobular Carcinoma After Neoadjuvant Endocrine Therapy

Kayla Switalla[1], Alex Lopes[2], Astrid Quirarte[3], Israel Falade[2], Nola Hylton[1], Ella Jones[1], Natsuko Onishi[1], Rita Mukhtar[1]

[1]University of California - San Francisco, San Francisco, CA, [2]University of California - San Francisco, School of Medicine, San Francisco, CA, [3]Carol Franc Buck Breast Care Center, University of California, San Francisco, San Francisco, CA

Background/Objective: Invasive lobular carcinoma (ILC) of the breast presents unique challenges in surgical management due to its diffuse growth pattern. Poor sensitivity of standard imaging tools leads to suboptimal surgical outcomes, and there is an unmet need for improved imaging modalities in ILC. As most ILC tumors are strongly estrogen receptor (ER) positive, the novel imaging tracer [F-18]fluoroestradiol (FES) has the potential to improve disease assessment in this tumor type. Thus, we evaluated the use of FES combined with dedicated breast PET (dbPET) in the preoperative evaluation of 19 patients with ILC.

Methods: We conducted a single-arm prospective clinical trial in which patients with ER+ ILC undergoing neoadjuvant endocrine therapy (NET) underwent breast imaging with FES-dbPET before and after treatment. Post-treatment dbPET features (uptake volume in cm3, peak FES uptake measured in standard uptake value (SUV), and SUV normalized by lean body mass index (SUL)) were correlated with MRI-measured longest tumor diameter, pathologic size, and Ki67 levels.

Results: A total of 19 patients enrolled in the trial and had baseline scans. Average age was 58 years (range 32-82), and average NET duration was 140 days, with 12.5% receiving a selective estrogen receptor modulator (SERM), 43.8% receiving an aromatase inhibitor (AI), and 43.8% receiving a selective estrogen receptor degrader (SERD). On baseline FES-dbPET, the primary tumor was visible in 17 patients (89.5%) with an overall average uptake volume of 24.4 cm3. The AI cohort exhibited an average uptake of 8.7 cm3 and MRI longest-diameter of 4.7 cm, while the SERM/SERD cohort had an average uptake of 49.4 cm3, and MRI longest-diameter of 5.9 cm. Post-treatment FES-dbPET scans in 13 patients showed primary tumor in 9 cases (69.2%), with an average uptake volume of 7.3 cm3, with no difference by AI vs SERM/SERD cohort (8.1cm3 vs 6.9 cm3, p=0.901). Additionally, among these 13 patients, 88.9% had a decrease in tumor uptake volume from pre-treatment scan, with an average decrease of 55.9%. Of those with a decrease in uptake volume, 57% had a corresponding decrease in MRI longest diameter, while 75% had a corresponding decrease in tumor Ki-67 level. When stratified by type of NET, post-treatment peak SUV (SUVpk) had a significant moderate positive correlation with post-treatment pathologic size within the SERM/SERD cohort (R2=0.58; p=0.046), but not in the AI cohort. Post-treatment SUVpk also exhibited a moderate correlation with post-treatment MRI longest tumor diameter (R2=0.46; p=0.044). Finally, post-treatment peak FES uptake normalized by lean body mass (SULpk) was significantly correlated with post-treatment Ki-67 (R2=0.40; p=0.048).

Conclusions: FES-dbPET had moderate sensitivity for detecting ILC tumors and demonstrated significant correlations with MRI and pathology findings. These results demonstrate the potential of this novel imaging tool for evaluating treatment response in the preoperative setting. Notably, we found that FES-dbPET may offer valuable insights into tumor biology beyond tumor extent alone. Given the unmet need for improved imaging tools in ILC, further research is warranted to better understand the significance of FES-dbPET features and optimize their role in enhancing surgical treatments.

1685675 - Axillary Lymph Node Screening in BIRADS 5 Breast Cancer

Chris Lewis[1], Debra Hwang[2], Marcella Fornari[3], Bryan Rettner[2], Danielle Lehman[4]

[1]Morristown Medical Center, Upper Saddle River, NJ, [2]Morristown Medical Center, Morristown, NJ, [3]Atlantic Health System, Morristown, NJ, [4]Rowan-Virtua School of Osteopathic Medicine, Morristown, NJ

Background/Objective: Staging, treating, and downstaging the axilla in malignant breast cancer has been an evolving process that has been trailblazed by the Z011 trial (2017); transitioning management of the axilla away from axillary lymph node dissection (ANLD) towards sentinel lymph node biopsy (SNLB)(Giuliano et.al, 2017). With a clear need to prevent the morbidity of SLNB/ALND and obtain a detailed diagnosis quickly and efficiently to expedite treatment plans, the goal of our study is to determine the accuracy of ultrasound in staging the axilla prior to finalizing a treatment plan.

Methods: Using the PENRADS system we targeted women over 18 with BIRADS 5 diagnostic imaging and pathologic confirmation of malignancy who visited our institution from 2018 to 2020. We further looked at patients in whom the axilla was not screened at the time of diagnostic imaging and a second look ultrasound was performed with or without biopsy. A preoperative positive axillary node was classified by a positive biopsy. A negative preoperative node was classified by either a negative axilla on imaging or a negative core biopsy. We compared the preoperative biopsies to final surgical pathology. Tumor biology and hormone receptor status were also used to stratify results, and more specifically the ability to downstage the axilla with neoadjuvant chemotherapy.

Results: We observed a 92% success rate in screening axillary lymph nodes at the time of diagnostic imaging in patients with a malignancy. Ultrasound sensitivity (37.9%) and specificity (87.5%) were calculated independent of tumor biology. Further evaluation of patients who underwent neoadjuvant therapy revealed a 67% downstage rate in patients with ER+ /PR+ carcinoma and a 57% downstage rate in ER+/ PR+/HER2 + carcinoma. Of the patients who required a second look biopsy (8), four had positive nodes on core biopsy.

Conclusions: With the high rate of patients having their axilla screened at the time of BIRADS 5 imaging, it is clear that our institution is taking the necessary steps to limit delays in the treatment for our patients. Surprisingly we observed a low sensitivity rate due to a large rate of false negatives. While this rate is lower than expected, we believe it is due to radiographically undetectable tumor burden in the axilla. We plan to expand the patient population to provide the opportunity to explore associations with specific tumor types and corresponding rates of axillary disease undetectable by ultrasound. This is becoming more relevant as the discussion to omit SLNB in post-menopausal women with hormone positive cancers is becoming more popular (Davey, et. al, 2023). The hope of this study is to further contribute to the advancement in axillary management in breast cancer and decrease morbidity.

1686399 - Selective Use of Post-operative Mammography Following Breast-conserving Surgery

Elisabeth Ekkel[1], Sayee Kiran[2], Alexander Chen[2], Diana Lee[2], TJ Quinn[2], Nayana Dekhne[2], Joshua Dilworth[2]

[1]Corewell Health, Sterling Heights, MI, [2]Corewell Health, Royal Oak, MI

Background/Objective: Post-operative mammography (POM) may be utilized to determine the presence of residual suspicious calcifications following breast-conserving surgery. POM, however, may lead to increased costs, delays in the initiation of adjuvant treatment, and patient anxiety. Data supporting the selective use of POM are limited. We investigated potential predictors of residual suspicious residual calcifications on POM.

Methods: We conducted a retrospective analysis of consecutively treated patients with non-metastatic breast cancer who underwent breast-conserving surgery and received POM from May 2016 to August 2017 at a single institution. We recorded patient characteristics, findings on pathology from the initial surgery, the presence of residual suspicious calcifications on POM, and the need for an additional procedure (including core biopsy, excisional biopsy, re-excision, and completion mastectomy). Wilcoxon Ranked-Sum and Fisher's Exact Tests were used to compare outcomes between patient cohorts. Univariate (UVA) and multivariable (MVA) analyses were conducted to identify potential predictors (including histology, hormone receptor status, grade, clinical size of tumor or span of calcifications, pathologic size of invasive tumor or span of DCIS, presence of an extensive intraductal component or lympho-vascular invasion, and margin status of in situ and invasive disease) of the presence of residual suspicious calcifications on POM.

Results: We identified 108 patients with either pure DCIS (66%), a mixture of DCIS and invasive ductal carcinoma (27%), pure invasive ductal carcinoma (6%), a mixture of DCIS and invasive lobular carcinoma (1%), or pure invasive lobular carcinoma (1%), who underwent breast-conserving surgery and received POM. Thirty-nine patients had clear surgical margins (defined as all margins greater than 2 mm), 55 patients had at least one close (defined at 2 mm or less) in situ or invasive surgical margin, and 16 patients had at least one involved in situ or invasive surgical margin. Twenty-four (22%) patients had residual suspicious calcifications identified on POM. Twenty (83%) patients with residual suspicious calcifications underwent an additional diagnostic or therapeutic procedure, and 14 (70%) of these had residual in situ or invasive carcinoma. On UVA, increasing size of DCIS (OR=1.27 [1.05,1.56], p=0.015) and close (OR=7.62 [1.94,50.8], p=0.01) or positive (OR=18.5 [3.63,144], p=0.001) DCIS surgical margins predicted the presence of residual suspicious calcifications on POM. Close (OR=6.5 [1.61,43.9], p=0.02) and positive (OR=14 [2.6,111.8], p=0.004) DCIS surgical margins remained significant on MVA.

Conclusions: Close and positive DCIS surgical margins predicted the presence of residual suspicious calcifications on POM. Avoidance of POM in patients with small areas of DCIS and clear DCIS surgical margins may be considered.

1643997 - Use of Ultrasound and MRI to Stage the Axilla for Breast Cancer Before and After Neoadjuvant Chemotherapy Prior to Targeted Sentinel Lymphadenectomy

Danielle Brabender[1], April Ballard[2], Sean Kim[1], Kate Guion[1], Madeleine Ing[1], Linda Hovanessian Larsen[3], Stephen Sener[4]

[1]Los Angeles General Medical Center, Los Angeles, CA, and Norris Comprehensive Cancer Center and Keck School of Medicine of USC, University of Southern California, Los Angeles, CA, [2]University of Southern California, Los Angeles, CA, [3]Keck Medicine of USC, University of Southern California, Los Angeles, CA, [4]University of Southern California, Pasadena, CA

Background/Objective: Prior data from this Center from 2015-2020 demonstrated that for patients who had biopsy-proven axillary metastases, were ycN0 after neoadjuvant chemotherapy (NAC) and had a wire-directed (targeted) sentinel lymphadenectomy (WD-SLND), 60% were node-negative. Completion axillary lymph node dissection (ALND) was not done in node-negative patients, and the regional node recurrence rate was 2% with 44-month median follow-up. The hypothesis of this study was that results of axillary imaging either before or after NAC would be predictive of final pathologic status after WD-SLND.

Methods: For patients treated with NAC between 2015-2023, ultrasound and MRI images were retrospectively and independently reviewed by radiologists specializing in breast imaging, who were blinded to the surgical and pathology results.

Results: Of 113 patients who fit the clinical criteria above, 66 (58%) were ypN0 at WD-SLND and 34 (30%) had a pathologic complete response to NAC. There was no correlation between the number of abnormal lymph nodes on pre-NAC ultrasound or MRI imaging and the final pathologic status of the lymph nodes at the time of WD-SLND. Analysis of the association between post-NAC axillary ultrasound and MRI images and the pathologic status of lymph nodes at WD-SLND revealed that sensitivity, specificity, and accuracy were 67%, 48%, and 56% for ultrasound and 61%, 61%, and 61% for MRI. The false-negative and false-positive rates for post-NAC imaging were 33% and 52% for ultrasound and 32% and 48% for MRI.

Conclusions: The results of axillary imaging either before or after NAC were not adequate to identify patients with persistently positive lymph nodes, for whom ALND could be directly done without the need for SLND. Imaging also did not identify patients who had converted from pN1 to ypN0, for whom surgical axillary staging might be avoided.

1685765 - Intraoperative Supine MRI for Breast-conserving Therapy: Final Results of AMIGO (Advanced Multi-Modality Image Guided Operating Suite) Phase II Clinical Trial

Leah Kim[1], Joseph Canner[2], Eric Schneider[3], Jayender Jagadeesan[4], Leah Portnow[4], Melissa Mallory[5], Dylan Kwait[4], Eva Gombos[4], Thanh Barbie[6], Mehra Golshan[7]

[1]Yale University School of Medicine, New Haven, CT, [2]Yale School of Medicine, Baltimore, MD, [3]Surgery Health Services and Outcomes Research Center, Yale University, Yale School of Medicine New Haven, CT, [4]Brigham and Women's Hospital, Boston, MA, [5]Moffit Cancer Center, Tampa, FL, [6]Brigham and Women's Hospital, Boston, MA, [7]School of Medicine, Yale University, New Haven, CT

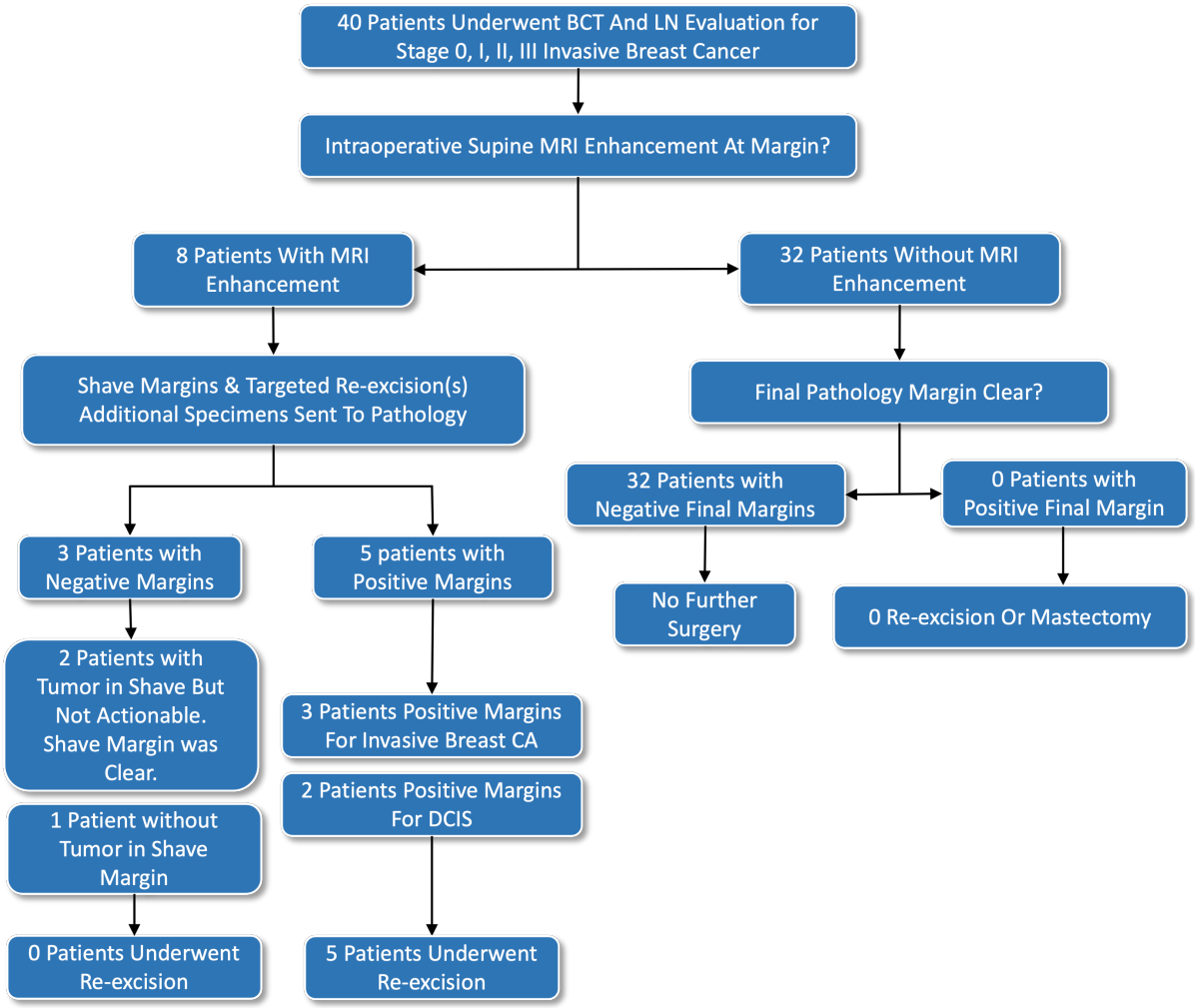
Background/Objective: The ability to achieve clear margins remains a challenge for breast surgical oncologists despite changes in margin definition, the use of shave margins, and other techniques. We know that positive margins lead to delay in initiation of adjuvant therapy, increased health care costs, increased risk of recurrence, increased complication rates, increased mastectomy rates and a negative psychological impact to the patient. We completed our phase II trial (NCT02335671) to evaluate the use of intraoperative MRI and intraoperative mass spectrometry to determine margins in real time. We present our final intraoperative MRI correlation to final histopathology.

Methods: Between 2015 and 2022, forty consecutive women with operable breast cancer being offered upfront local regional therapy underwent breast conserving therapy with intraoperative MRI and lymph node evaluation. The technique involved standard lumpectomy with or without wire/seed localization, the lumpectomy cavity was temporarily filled with resected volume saline, an intraoperative breast MRI was obtained, then shave margins that incorporated Anterior, Posterior, Superior, Medial, Lateral and Inferior margins being sent as final margins to pathology. All patients received contrast enhanced breast MRI under general anesthesia in the supine position. Positive margins that required re-excision was ink on tumor invasive cancer and less than or equal to 2 mm for DCIS. Fisher's Exact Test was used for association between MRI enhancement and positive margins.

Results: Mean invasive tumor size was 1.9 cm. Of our 40 patients, 8 patients (20%) had intraoperative enhancement. Three patients with intraoperative enhancement had pathologic clear margins on final histopathology shave margins (no ink on tumor). On final histopathology, 3 patients had positive margins for invasive breast cancer and 2 for DCIS. Three patients ultimately underwent mastectomy for persistently positive margins, while two underwent successful breast conservation. Intraoperative MRI sensitivity and specificity were 100% and 97% respectively, along with a positive predictive and negative value of 87.5% and 100% respectively for correlating to final histopathology. The association between MRI enhancement and positive margins was < 0.001%.

Conclusions: Supine post lumpectomy intraoperative MRI is feasible, highly accurate, and provides actionable information during surgery. Despite implementation limitations for the widespread development of intraoperative MRI, the use of supine MRI in the diagnostic setting warrants further evaluation in the surgical management of operable breast cancer.

Figure 1: Flow diagram of intraoperative supine MRI for breast-conserving therapy with final pathology results and subsequent re-excisions



1664453 - Magtrace Can Sustainably Improve Theatre Efficiency, Operative Capacity, and Patient Experience

Blossom Lake, Mandy Wilson, Donna Appleton

Shrewsbury & Telford NHS Trust, Telford, England, United Kingdom

Background/Objective: Magtrace is an iron oxide liquid which has revolutionized sentinel lymph node biopsy treatment for breast cancer. It has a flexible injection window which allows patients to have the injection prior to the day of surgery at a convenient time for both the patient and the provider and removes the need for nuclear medicine completely. Magtrace was reviewed by the National Institute for Health and Care Excellence in October 2022 (MTG72) and they highlighted that Magtrace has the potential to reduce cost based on an expectation that its usage would enable hospitals to perform additional sentinel node biopsies due to improved operating room utilization. The National Institute for Health and Care Excellence (NICE) provides national guidance and advice to improve health and social care in the UK. This guidance is the gold standard for advice for breast cancer treatment. Our team designed a study to investigate the "additive effect" of Magtrace in improving theatre efficiency, operative capacity, and patient experience (Presented at European Society of Surgical Oncology, to be published in European Journal of Surgical Oncology early 2025). The aim of this study was to assess if these previously described benefits of Magtrace by NICE are sustained in a hospital system.

Methods: All Magtrace cases for sentinel node biopsy at the Shrewsbury & Telford NHS Trust were prospectively recorded. The outcomes measured were operating room utilization, number of sentinel node biopsies performed per week, and patient satisfaction.

Results: 150 patients undergoing a wide local excision or mastectomy received Magtrace as the sole technique for SLNB. Operating room utilization improved from 77% to 84% (with peak utilisation at 96%) due to a reduction in OR delays and improved OR flow. Previous delays were caused by patients waiting to have radioisotope injections. Significantly more sentinel node biopsies were performed per week, increasing from 6.48 per week (Pre Magtrace 2022) to 8.57 per week (Post Magtrace) (t-value = 3.53057, p-value < 0.00041). This resulted in a net increase of 2 additional patients per week. The t-value is 3.53057. The p-value is .00041. The result is significant at $p < 0.05$. The study showed high patient satisfaction with 100% of patients finding injection more convenient on the day of surgery and 100% of patients would recommend Magtrace to a friend or relative.

Conclusions: Utilising Magtrace for sentinel lymph node biopsy creates a sustained "additive effect" by improving operating room utilization, operating room capacity and demonstrates a high patient satisfaction.

1684915 - Wire and Radar Localization of Impalpable Breast Lesions: International iBRA-NET Localization Study

James Harvey[1], Suzanne Elgammal[2], Yazan Masannat[3], Tahir Masudi[4], Robert Milligan[5], Jenna Morgan[6], Rajiv Dave[7], Santosh Somasundaran[8], Julia Henderson[9], Rachel Foster[1], Suzanne Krizak[10], Simon Lowes[11]

[1]Breast Oncology, Manchester, England, United Kingdom, [2]Breast Oncology, Glasgow, Scotland, United Kingdom, [3]Broomfield Hospital, Mid and South Essex Hospitals NHS Trust, Chelmsford, England, United Kingdom, [4]Breast Oncology, Rotheram, England, United Kingdom, [5]Breast Oncology, Newcastle-Upon-Tyne, England, United Kingdom, [6]Breast Oncology, Sheffield, England, United Kingdom, [7]The Nightingale and PREVENT Breast Cancer Centre, Manchester University NHS Foundation Trust & Faculty of Biology, Medicine and Health, University of Manchester, Manchester, United Kingdom, [8]University Hospitals of Morecambe Bay, Manchester, England, United Kingdom, [9]Breast Oncology, Liverpool, England, United Kingdom, [10]Breast Oncology Research, Manchester, England, United Kingdom, [11]Breast Oncology, Newcastle, England, United Kingdom

Background/Objective: The IBRA-net localisation study was designed to prospectively audit outcomes of these devices and to support breast surgery in conforming to the IDEAL guidelines for surgical trials of "No Innovation without Evaluation". Wire localisation is historically the most common method for guiding excision of non-palpable breast lesions, but there are limitations to the technique. The iBRA-NET Localisation Study is a UK-based international, multi-centre, prospective, IDEAL stage 2a/2b platform cohort study, with embedded novel shared-learning methodology, that compared safety and effectiveness of paramagnetic-seed, magnetic seed, radar localisation, and radiofrequency implantable devices versus a control group of wire-guided breast lesion localisations. The aim of this arm of the platform study was to compare the safety and effectiveness of the two cohorts of wire and Savi Scout® radar reflector localisation.

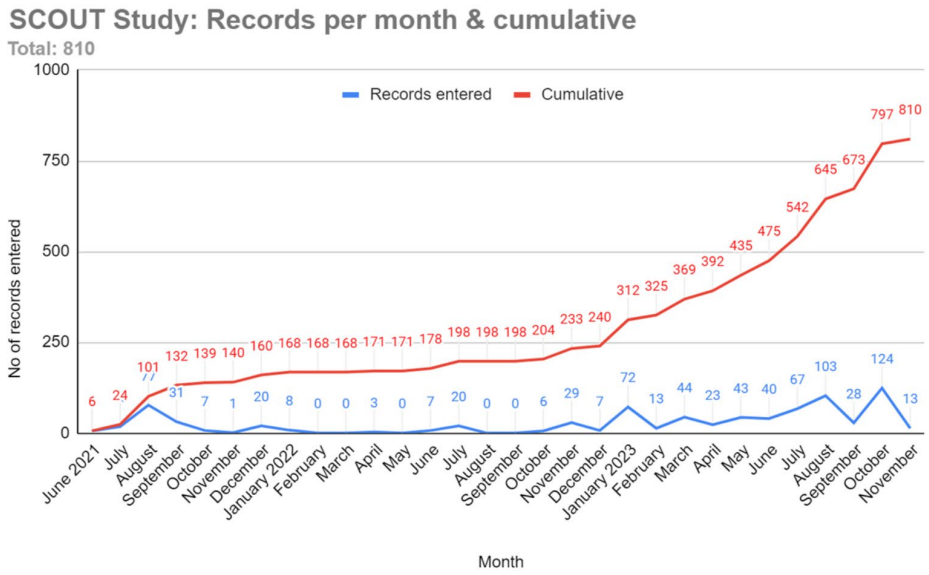
Methods: All UK breast and plastic surgical units performing wire or radar breast localization were invited to participate in the study, through national professional organizations. Consecutive women undergoing wire or radar localisation for non-palpable lesions between August 2018 and Dec 2023 were recruited prospectively to this IDEAL stage 2a/2b platform cohort study. Ethics approval was not required, as this was a service evaluation, as defined by the Health Research Authority decision tool. Each participating centre was required to obtain local audit approvals and register the study before commencing recruitment—consistent with the methods reported previously for multicentre prospective collaborative studies. Study data were collected in an anonymized format and managed using REDCap electronic data capture tools. The primary outcome was effectiveness defined as accurate localisation and removal of the index lesion. Secondary endpoints included safety, specimen weight and volume and reoperation rate for positive margins. For comparative analysis, the study aimed to recruit 950 women undergoing unifocal, unilateral lesion localization. Shared learning was embedded within the case report form to promote an increased pace of learning and to enable optimisation of technique.

Results: Data collection for the control group of wire localisations is complete with 1296 patients data sets. Currently 25 sites are recruiting (16 UK and 9 international) to the radar arm of the study from 75 collaborators and 810 patient localisations have been fully recorded. Recruitment for the radar localisation arm will cease on 31st January 2024. 26 shared learning events have been registered by users. Data cleaning analysis is due to be complete by end March 2024 ready for presentation in April 2024. Wire localisation demonstrated a 99.1% successful localisation, with a re-excision rate of 13.2%.

Conclusions: This large multi-centre platform study directly compares radar localisation with wire localisation so that the safety and effectiveness of radar localisation can be established amongst a diverse group of international users. This will form the largest comparative analysis of radar and wire localisation efficacy.

Figure 1: SCOUT localisation study recruitment data

SAVI SCOUT Localisation Study Data
June 2021 - Nov 2023



1684495 - A Single Center Pilot Study: Feasibility of Magnetic Seed and Supramagnetic Iron Oxide Nanoparticles Combination in Breast-conserving Surgery with Sentinel Lymph Node Biopsy

Annie Tang[1], Jessica Hayward[2], Heather Greenwood[2], Elissa Price[2], Amie Lee[2], Rita Freimanis[2], Maggie Chung[2], Michael Alvarado[1]

[1]University of California San Francisco, San Francisco, CA, [2]University of California San Francisco, San Francisco, CA

Background/Objective: Breast tumor localization for breast conserving surgery has evolved over the years towards more facile technical localization for the surgeon while balancing patient convenience. Supramagnetic iron oxide nanoparticles (Magtrace) is a magnetic tracer and dye that has been validated for sentinel lymph node biopsy. However, residual particles after Magtrace injection may remain in breast tissue and cause artifacts in subsequent MRIs. Simultaneous placement of a magnetic seed (Magseed) and Magtrace directly in breast cancer tumors for those undergoing breast conserving surgery (MagTotal) may reduce artifact while allowing for efficiency and patient convenience in the preoperative setting. As the first United States pilot study, we evaluated the feasibility of the combination of Magseed localization with Magtrace sentinel lymph node biopsy in partial mastectomies.

Methods: We conducted a prospective cohort study analyzing women with breast cancer who underwent partial mastectomy with Magseed tumor localization combined with Magtrace for sentinel lymph node biopsy at a single institution between March 2023 - October 2023. During the preoperative visit, a breast radiologist placed the Magseed followed by injection of Magtrace directly in the tumor bed under ultrasound guidance. Primary outcome was successful seed extraction and sentinel lymph node identification. Secondary endpoints include re-excision rates and number of sentinel lymph nodes identified.

Results: A total of 26 patients underwent MagTotal at our institution. The median administration time of Magseed and Magtrace prior to surgical excision was 19 hours (interquartile range 4.5-24) and 57.7% received the injection prior to the day of surgery. In addition to Magtrace, 42.3% (n=11) received another tracer for sentinel lymph node biopsy mapping when injection was on the same day as surgery. Tumor histology comprised 92.3% ductal and 7.7% lobular. All patients had Magseed extracted, and sentinel lymph node identified. Of those who received Magtrace, 80.8% (n=21) had sentinel lymph node identified with a median of two lymph nodes. The mean count was 4336 (SD=2489). All patients with failed MagTrace mapping (n=5) underwent same day injection; 6 hours or less prior to surgery. The re-excision rate was 11.5% (n=3) for positive margins; two for DCIS at the margin and one for underestimated invasive lobular carcinoma.

Conclusions: Our study suggests that injection of Magtrace at least 6 hours preoperatively can decrease the chance of failed lymph node mapping during a MagTotal procedure. Utilization of Magseed for localization in combination with Magtrace for sentinel lymph node biopsy is feasible and safe. Further studies are warranted to confirm and improve MagTotal feasibility and assess long-term outcomes.

1688656 - Establishing the Ground Truth of Magnetic Resonance Imaging (MRI) Artifact in SmartClip GPS Technologies for Non-palpable Breast Tumors

Paul Thiruchelvam[1], Daniel Leff[2], Neil Upadhyay[2]

[1]Imperial College Healthcare NHS Trust, London, England, United Kingdom, [2]Imperial College London, London, England, United Kingdom

Background/Objective: Historically, wire localisation (WL) has been the standard of care for clinically occult breast tumor localisation. Whilst WL remains reliable and cost effective, they are often painful, may migrate and require coordination of radiological and theatre schedules. Subsequently, alternative wire-free localization (SmartClip GPS) technologies have been developed and are now being increasingly adopted. Neoadjuvant Chemotherapy (NACT) has enabled de-escalation in the management of the axilla (Targeted Axillary Dissection) and breast may facilitate increased rates of breast conserving surgery. Localization of the tumor with a marker clip at diagnosis facilitates targeted resection following NACT. However, the perceived MRI artifact of SmartClip GPS may preclude their use in this setting due to concerns with monitoring response. We present the first reported assessment of the MRI artifact of 6 commonly used SmartClip GPS technologies.

Methods: For the 6 different SmartClip GPS devices 1.SmartClip®, 2.Pinuition Seed, 3.LOCalizerTM, 4.Magseed® Marker, 5.Savi Scout® & 6. novel paramagnetic Magseed were placed under ultrasound guidance into a CRIS model 073 multi-modality breast training phantom, centrally and in a vertical orientation, 3cm deep to the anterior surface. MRI scanning was undertaken in an Academic Cancer Center using two different MRI systems (Siemens 1.5T Magnetom Avanto & Siemens 3T Magnetom Verio). A T1-weighted 3D fast low angle shot (FLASH) sequence with fat suppression plus a 3D T2-weighted turbo spin echo (TSE) sequence were acquired on the Siemens 1.5T system. On the Siemens 3T an equivalent T1-weighted 3D FLASH sequence was acquired but the T2-weighted TSE was a 2D sequence. The MRI artifact of each SmartClip GPS technology was measured in 3 dimensions – transverse, AP and CC recon (mm).

Results: For all devices, the MRI artifacts are reported in Figure 1 below. The trend demonstrates considerably less artifact with novel Endomagnetic Magseed and Merit Medical Savi Scout versus of localisation technologies.

Conclusions: This is the first analysis of MRI artifacts across SmartClip GPS technologies currently used for clinically occult breast tumour localization. This demonstrates that only the novel paramagnetic Endomag Magseed and SAVI Scout can be placed at the time of biopsy, including those patients due to have NACT without detrimental impact on assessment of tumor response.

Table 1: The MRI artifact size of SmartClip GPS technologies - Elucent Medical SmartClip®, Sirius Pinuition Seed, Hologic LOCalizerTM, Endomag Magseed® Marker, Merit Medical Savi Scout®, and novel Endomag Magseed using Siemens 1.5T and 3T, T2 and T1 GRE sequences

MRI Sequences	Elucent Medical SmartClip®	Sirius Pinuition Seed	Hologic LOCalizerTM	Endomag Magseed®	Merit Medical SAVI Scout®	novel Endomag Magseed
1.5T - T2 (T x AP x CC mm)	26 x 26 x 44	68 x 70 x 78	38 x 39 x 53	56 x 56 x 64	5 x 14 x 9	7 x 11 x 15
1.5T - T1 GRE (T x AP x CC mm)	48 x 48 x 42	110 x 116 x 62	62 x 62 x 46	62 x 62 x 62	6 x 14 x 12	14 x 17 x 15
3T - T2 (T x AP x CC mm)	26 x 33 x 36	60 x 58 x 61	48 x 43 x 48	47 x 46 x 64	7 x 15 x 11	9 x 14 x 14
3T - T1 GRE (T x AP x CC mm)	40 x 41 x 47	64 x 86 x 70	62 x 55 x 58	64 x 66 x 66	8 x 15 x 15	11 x 10 x 16

1688698 - Intra-operative Ultrasound-guided Breast-conserving Surgery: A Performance Analysis Based on Breast Cancer Lesion Types Classification and Patient Satisfaction Assessment

Massimo Ferrucci[1], Francesco Milardi[2], Daniele Passeri[2], Matteo Cagol[1], Mariacristina Toffanin[1], Paola Del Bianco[1], Ugo Grossi[2], Alberto Marchet[1]

[1]Veneto Institute of Oncology IOV, Istituto di Ricovero e Cura a Carattere Scientifico (IRCCS), Padova, Veneto, Italy, [2]University of Padua, Padua, Veneto, Italy

Background/Objective: Intra-operative ultrasound (IOUS)-guided breast conserving surgery (BCS) guarantees real-time direct visualization of tumor and continuous control of resection margins during all excision phases. IOUS potentially achieves lower involved margin rates and reduced healthy tissue removal. We compared IOUS performance with traditional (palpation- or wire-guided) surgery (TS) for all breast cancer (BC) lesion types, and assessed patient satisfaction one year after surgery.

Methods: This was a prospective observational cohort study conducted at Veneto Institute of Oncology between January 2021 and October 2022. We recruited patients diagnosed with ductal carcinoma in situ or T1-2 primary invasive BC, who were considered suitable for BCS. We introduced a novel classification encompassing all BC lesion types: solid palpable (type A); solid non-palpable (type B); non-solid non-palpable (type C); post-neoadjuvant treatment residual lesions (type D). Eligible participants were randomly assigned to either IOUS or TS in a 1:1 ratio. Patient satisfaction was assessed using an 11-item questionnaire, derived from BREAST-Q Breast-Conserving Therapy Module, resulting in a RASCH transformed score. The main outcomes were: involved margin rates; excess healthy tissue removal (defined as tumor volume to excision volumes ratio); calculated resection ratio (CRR), meant as specimen volume related to an optimal resection volume; excision time; and patient satisfaction. IOUS performance was evaluated in relation to these main outcomes and compared across all BC lesion types.

Results: We enrolled 206 patients, 103 allocated to TS and 103 to IOUS. Median excision time was nearly 7 minutes shorter after TS ($p< 0.001$). IOUS significantly reduced excised volumes ($p=0.026$) and improved tumor volume to specimens volumes ratios ($p=0.002$), as well as the CRR ($p< 0.001$). The IOUS group achieved significantly lower involved margin and re-operation rates ($p=0.002$ and $p=0.01$, respectively), in addition to wider closest margin width ($p< 0.001$). One-year follow-up patient satisfaction was significantly higher after IOUS ($p< 0.001$) and strongly associated with the amount of excised volumes ($p< 0.001$). Among the IOUS group, there were no significant differences in any of the main outcomes based on different BC lesion type groups. Despite a shorter excision time after TS for any BC lesion type, IOUS yielded global improvements. It significantly achieved: wider closest margin width in type A, B and C lesions ($p=0.016$; $p=0.028$ and $p=0.002$, respectively); better tumor volume to specimens volumes ratios in type B, C and D lesions ($p=0.025$; $p=0.011$ and $p=0.006$, respectively); improved CRR in type C and D lesions ($p=0.013$ and $p=0.004$); higher patient satisfaction in type A, B, C and D lesions ($p=0.075$; $p=0.054$; $p=0.063$ and $p=0.008$, respectively). Type C lesions also showed lower involved margin and re-operations rates after IOUS, despite having larger tumor volumes.

Conclusions: IOUS confirmed a clear superiority over TS in oncological and surgical outcomes. IOUS also guaranteed lower excised volumes, resulting in higher patient satisfaction and, potentially, better cosmetic outcome. It proved to be highly effective for all BC lesion types, with the best results achieved in the most challenging ones, namely Type C and Type D. Our findings strongly suggest to consider IOUS as the new gold standard for BCS.

1685219 - Does Mastectomy Abrogate the Elevated Risk of Local Recurrence Associated with Multifocal Regression After Neoadjuvant Chemotherapy?

Sruthi Jaishankar[1], Phillip Pifer[2], Diane Ling[3], Emilia Diego[4], Atilla Soran[5], Jennifer Steiman[6], Kristin Lupinacci[7], Qurat Ul Ain Sabih[7], Michael Cowher[8], Priscilla McAuliffe[7], Ronald Johnson[7], Rohit Bhargava[9], John Vargo[10]

[1]University of Pittsburgh School of Medicine, Pittsburgh, PA, [2]West Virginia University School of Medicine, Morgantown, WV, [3]University of Southern California, Los Angeles, CA, [4]University of Pittsburgh, Pittsburgh, PA, [5]UPMC Magee Women's Hospital, Pittsburgh, PA, [6]Breast Surgical Oncology at UPMC, Pittsburgh, PA, [7]UPMC Division of Surgical Oncology, Pittsburgh, PA, [8]Division of Surgical Oncology, UPMC, Pittsburgh, PA, [9]Magee Women's Hospital, Pittsburgh, PA, [10]UPMC, Pittsburgh, PA

Background/Objective: Increasingly, patients with breast cancer are receiving neoadjuvant systemic therapy to improve downstaging prior to surgery and to guide response-adaptive intensification of adjuvant systemic therapy. Patients with multifocal regression after neoadjuvant therapy, especially those with hormone-receptor negative phenotypes, are at increased risk of local failure after breast conservation therapy (BCT) and radiotherapy (PMID: 30885777). It is unclear if intensification of local therapy with mastectomy and post-mastectomy radiotherapy will decrease local failure in all cases or if a subtype-specific approach is needed.

Methods: 653 patients treated with neoadjuvant systemic therapy and adjuvant radiation therapy between May 2006 and June 2017 were retrospectively reviewed. Pattern of regression was categorized as pathologic complete response (pCR), unifocal (tumor present as a cohesive mass), limited multifocal (single cells or clusters of cells concentrated in 1 portion of the fibrotic area), or diffuse multifocal (cells spread over entire fibrotic area). Tumor control and survival were calculated using Kaplan Meier and Cox Regression methods, and compared by primary surgical type (BCT versus mastectomy).

Results: 47% of patients in the cohort received mastectomy followed by radiotherapy and 53% received BCT and radiotherapy. Median follow-up was 53 months (IQR: 25-83). Patterns of regression were: 31% pCR, 37% unifocal, 8% limited multifocal, and 24% diffuse multifocal. Multifocal regression was more common in luminal (45%) and triple positive (40%), compared to ER/PR negative HER2+ (20%) and triple negative (19%) phenotypes ($p< 0.01$). The 5-year local control rate was 91% (95% CI: 89-94%). The 5-year local control by response patterns by surgical type are shown in Table 1 ($p< 0.01$). On univariable analysis, significant predictors of local recurrence were phenotype, lymphovascular space invasion (LVSI), patterns of regression, nodal pCR, and primary pCR. There were no significant differences due to age, clinical stage, margin status, or surgical type. On multivariable analysis, nodal pCR, LVSI, and phenotype remained significant predictors of local recurrence with no differences noted by pattern of regression in the overall cohort or the mastectomy subgroup. On multivariable analysis, higher rates of local failure were noted in the breast conservation subgroup for patients with diffuse multifocal regression (HR 11.2, 95% CI 2.6-49.2, $p< 0.01$ compared to pCR). A previously identified 3-factor system (diffuse multifocal regression, hormone-negative phenotype, and lack of nodal pCR) remained predictive of local failure in the entire cohort ($p< 0.01$) and in the breast conservation subgroup ($p< 0.01$), but no difference was noted in the mastectomy subgroup ($p=0.21$).

Conclusions: Intensification of local therapy with mastectomy may mitigate the elevated risk of local failure seen in patients with diffuse multifocal regression treated with neoadjuvant systemic therapy and BCT. This is supported by the results showing that multifocal regression did not seem to influence outcomes in patients treated with mastectomy, whereas patients treated with lumpectomy who had diffuse multifocal regression had poor outcomes (consistent with our prior work).

Table 1. 5-year local control rates by pattern of regression according to primary surgical type

	pCR	Unifocal	Limited multifocal	Diffuse multifocal
BCT [5-year local control (95% CI)]	96% (92-100%)	92% (87-97%)	96% (89-100%)	88% (79-87%)
Mastectomy [5-year local control (95% CI)]	98% (93-100%)	83% (74-92%)	92% (76-100%)	94% (89-99%)

1686622 - Axillary Management Patterns in Patients with Ipsilateral Breast Tumor Recurrence

Gabi Barmettler[1], Ko Park[2], Tari King[2], Jacob Jasper[3], Elizabeth Mittendorf[2], Brigid Killelea[2], Olga Kantor[2]

[1]Massachusetts General Hospital/Dana Farber Cancer Institute Brigham, Boston, MA, [2]Brigham and Women's Hospital, Boston, MA, [3]Dana Farber Cancer Institute, Boston, MA

Background/Objective: Ipsilateral breast tumor recurrence (IBTR) approaches 10-15% at 20 years. Guidelines regarding axillary management for IBTR patients are vague but suggest that axillary staging with repeat sentinel lymph node biopsy (SLNB) attempt is reasonable. The aim of this study was to identify patterns of axillary management and predictors of axillary surgery for IBTR patients in a large, population-based cohort.

Methods: The SEER database was used to identify patients with non-metastatic breast cancer who underwent breast conserving surgery (BCS) at first cancer diagnosis between 2000-2020. IBTR was defined as a second ipsilateral breast cancer event in a later year. Removal of 1-9 lymph nodes was used as a surrogate for SLNB and removal of ≥10 lymph nodes was considered an axillary lymph node dissection (ALND). Descriptive statistics and multivariate regression were used to examine rates and predictors of axillary surgery at IBTR.

Results: Of 9,970 patients with IBTR, median age at first cancer was 57 (range 21-90) and median age at IBTR was 67 (range 27-90). At IBTR, most patients presented with T1 (51.8%) or T2 (17.7%) disease, were N0 (78.3%), M0 (94.7%), grade 2 (43.7%), estrogen-receptor positive (73.1%), and HER2-negative or unknown (77.5%). Of the 8,506 (85.4%) IBTR patients that had breast surgery, 2,078 (24.4%) had repeat BCS, 4,666 (55.2%) had unilateral mastectomy and 1,729 (20.3%) had bilateral mastectomy. Axillary surgery at first cancer diagnosis was performed in 8,821 (88.5%) patients and omitted in 1,018 (10.2%) patients (n=132, 1.3% unknown). Axillary surgery for IBTR included no axillary surgery in 41.4%, SLNB in 49.8% and ALND in 8.8%; this varied based on extent of axillary surgery at first cancer (Table). At IBTR, 56.5% of patients without prior axillary surgery, 69.7% of patients with prior SLNB, and 29.4% of patients with prior ALND underwent axillary surgery. Axillary surgery at IBTR was impacted by age: (60.3% of patients age < 50 vs 53.6% of patients age ≥70, p< 0.001), type of previous breast surgery (41.8% of BCS patients vs 63.2% of unilateral and 66.4% of bilateral mastectomy patients, p< 0.001), and prior RT (56.4% of patients with no prior RT vs 59.7% with prior RT, p=0.007). Multivariable analysis adjusting for factors at first cancer and IBTR found the following to be associated with increased likelihood of axillary surgery at IBTR: prior SLNB (OR 1.46, 95% CI 1.22-1.76, p< 0.001), N+ at IBTR (OR 16.76, CI 12.30-22.85, p< 0.001), RT at first cancer (OR 2.18, CI 1.81-2.63, p< 0.001), and mastectomy at IBTR (OR 3.50 for unilateral, OR 4.20 for bilateral, both p < 0.001). Factors associated with not performing axillary surgery included age ≥70 (OR 0.65, 95% CI 0.53-0.79, p< 0.001), prior ALND (OR 0.27, CI 0.22-0.34, p< 0.001) and N+ at first cancer (OR 0.43, 95% CI 0.37-0.49, p< 0.001).

Conclusions: Axillary surgery at IBTR was driven mainly by prior axillary surgical management, N stage at IBTR, and surgical treatment of the breast, with SLNB being the axillary staging method of choice. ALND was the least common choice for axillary management in patients with IBTR.

Table 1: Axillary surgery patterns for IBTR (in n=8,221 patients with known axillary surgery)

	Axillary Surgery for IBTR No. (%)		
	None	SLNB	ALND
Axillary Surgery for 1st Cancer	3,305 (40.2)	4,185 (50.1)	731 (8.9)
None (n=771)	335 (43.5)	345 (44.7)	91 (11.8)
SLNB (n=5,675)	1,717 (30.3)	3,374 (59.4)	584 (10.3)
ALND (n=1,775)	1,253 (70.6)	466 (26.2)	56 (3.2)

1749298 - Risk Assessment, Prevention and Early Detection of Breast Cancer-related Lymphedema – Objective Measurements and Patient-reported Outcomes

Anshumi Desai[1], Orli Friedman-Eldar[2], Gili Halfteck[2], Christina Layton[2], Areej Al-Humaid[2], Eliezer Ponce De Leon[3], Mecker Moller[2], Dido Franceschi[2], Susan Kesmodel[4], Neha Goel[4], Jessica Crystal[4], Laura Huang[2], Diana Molinares[2], Jennifer Hu[2], Tulay Koru-Sengal[2], Wei Zhao[2], Alexis Narvaez-Rojas[2], Eli Avisar[2]

[1]University of Miami Medical School, Miami, FL [2]University of Miami, Miami, FL, [3]Florida International University, Miami, FL, [4]UMiami, Sylvester Comprehensive Cancer Ctr, Miami, FL

Background/Objective: Breast cancer-related lymphedema (BCRL) detrimentally affects the quality of life of breast cancer survivors yet monitoring and detection lack standardized consensus. Patient-reported outcomes (PROs) are crucial for evaluating survivorship, with various lymphedemaLE)-specific tools offering targeted assessments. We employ preventative surgical techniques such as Axillary Reverse Mapping (ARM), Lymphatic Microsurgical Preventive Healing Approach (LYMPHA), and Simplified LYMPHA (SLYMPHA) as standard procedures in private academic, and safety net medical settings. The objective of this study is to compare LE incidence following these surgeries and correlate it with PROs to evaluate their effectiveness.

Methods: 100 patients scheduled for possible Axillary Lymph Node Dissection (ALND) or Sentinel Lymph Node Biopsy (SLNB) with radiation were recruited. Baseline data including arm circumference, L-Dex (Bio-impedance spectroscopy) measurements, and LE-specific questionnaires (PROs)-Lymphedema Quality-of-Life Inventory (LYQLI); Lymphedema Quality of Life (LYMQOL), and Functional Assessment of Cancer Therapy-LE (FACT-B4+) were collected. An L-Dex score outside the normal range (±10 L-Dex unit) or ≥10 L-Dex unit increase above the baseline was considered LE. Higher FACT-B4+ indicates better quality of life while higher LYMQOL and LYQLI score indicates poor quality of life. Demographics, tumor specifics, and treatment approaches, including surgical details of ALND, LYMPHA, or SLYMPHA, and medical and radiation therapies were collected. Post-operative 6-month objective measures and PROs were compared for assessment.

Results: We analyzed 67 patients who completed all three PROs and received an L-Dex. Almost half of the patients recruited from the community hospital did not have insurance to cover the L-Dex; three patients were deceased, resulting in a 73.6% (67/91) response rate with the three PROs. The participants were predominantly over 50 years (59.7%). Postmenopausal women had a higher incidence of LE compared to premenopausal women (41.7% vs 10.3%, p=0.005). 76.1% were white, with 82.4% without LE. African Americans had a higher LE (60.0%) compared to white patients (17.6%). 49.3% of cases had breast reconstruction, with a significant 90.9% without LE (p=0.001). Of the 67 patients, 46 received ALND with either LYMPHA or SLYMPHA (23.9% with LE), 15 had ALND without LYMPHA or SLYMPHA (46.7% with LE), and 6 received only SLNB with radiation (none with LE). 76.5% of patients without LE had a FACT-B4+ score above the median, however this was not significant. Table 1 displays the correlations between PRO measures LYMQOL and LYQLI with the post-operative L-Dex and FACT-B4+. PROs had a weak correlation with post-operative L-Dex. The LYMQOL Function domain had a strong negative correlation with post-operative FACT-B4+ ($p< 0.0001$), while the LYMQOL Appearance, Symptom, and Emotion domains showed moderate to strong negative correlations with post-operative FACT-B4+ (coefficients range: -0.46 to -0.49, $p< 0.0001$). LYQLI domains followed a similar pattern, with strong negative correlations with post-operative. FACT-B4+ (coefficients range: -0.59 to -0.71, $p< 0.0001$).

Conclusions: These preliminary results validate using PROs alongside objective measurements to assess BCRL. In addition, LYMPHA and S-LYMPHA reduce lymphedema rates. When cost-containment is an issue appropriate PRO can be used as a surrogate for L-dex measurements. Larger numbers will be necessary to reach statistical significance and to identify the best PRO.

Table 1: Correlation between PRO (LYMQOL and LYQLI) with LDEX and FACT-B4+

Difference between post-operative and pre-operative score	Post-operative L-DEX score (Correlation coefficient)	p-value	Post operative FACT-B4+ score (Correlation coefficient)	p-value
LYMQOL Function	0.04486	0.7185	-0.52973	<0.0001
LYMQOL Appearance	-0.16386	0.1852	-0.47842	<0.0001
LYMQOL Symptom	0.07408	0.5513	-0.49299	<0.0001
LYMQOL Emotion	0.08122	0.5135	-0.45848	<0.0001
LYQLI physical	0.0687	0.5807	-0.59047	<0.0001
LYQLI Psychological	0.0166	0.8939	-0.70516	<0.0001
LYQLI Practical	-0.03671	0.7680	-0.62493	<0.0001

1683889 - Utility of Axillary Reverse Mapping in Ethnically Diverse Patients: An Approach to Reduce Breast Cancer-related Lymphedema

Fardeen Bhimani[1], Sheldon Feldman[1], Arianna Cavalli[2], Yu Chen[1], Liane Obaid[2], Carolyn Rachofsky[2], Kelly Johnson[1], Anjuli Gupta[1], Jessica Pastoriza[1], Maureen McEvoy[1]

[1]Montefiore Medical Center, Bronx, NY, [2]Albert Einstein College of Medicine, Bronx, NY

Background/Objective: Breast Cancer-Related Lymphedema (BCRL) is a persistent complication that impacts a patient's quality of life following lymph node surgery. Traditionally, BCRL has been observed in 3-8% of patients who undergo sentinel lymph node biopsy (SLNB) and in 13-60% of those undergoing Axillary Lymph Node Dissection (ALND). This risk increases twofold among low-income and ethnic minority populations. Axillary Reverse Mapping (ARM) is a novel technique for distinguishing arm and breast drainage pathways; prior studies using the ARM technique have demonstrated significantly reduced rates of BCRL. However, there is a paucity of literature highlighting the utility of ARM in ethnic minority groups. Therefore, the study's primary aim was to investigate ARM's utility and outcomes on BCRL in an ethnically diverse group at our institution.

Methods: A retrospective chart review was carried out of patients who underwent axillary surgery with ARM from January 2019 to July 2022. Demographic information such as age, body mass index (BMI), gender, and ethnicity was recorded. Patients who underwent mastectomy vs. breast conservation with SLNB ± ALND associated with ARM were monitored for lymphedema for 24 months at 3-month intervals using SOZO® scores. At each follow-up, SOZO® scores were computed using bioimpedance spectroscopy (BIS) and compared to pre-operative baseline scores.

Results: A total of 212 patients' data was evaluated, of which 83% belonged to the ethnic minority group (African-American=72, Hispanic=96, Asian=8). Mean BMI was 29.5+5.7 kg/m2. SLNB and ALND were performed on 83.5% (n=177) and 16.5% (n=35) of the patients, respectively. Furthermore, 62.3% (n=132) of the patients underwent radiation therapy. Positive lymph nodes were identified in 31.6% (n=67) of patients. Blue nodes and blue lymphatics were encountered in 22.2% (n=47) and 25.9% (n=55) of patients, respectively. Out of the blue nodes identified (n=47), 68.1% (n=32) were excised, and 53.1% (n=17) were diagnosed as crossover nodes. Of all the crossover nodes that were resected, 1 patient contributed to the development of lymphedema. Of the 212 patients, 18 patients developed lymphedema, of which 15 patients had a resolution on their respective 3-month follow-up indicating transient lymphedema. Among the 3 patients (1.4%) that developed persistent lymphedema, 2 underwent ALND, and 1 underwent SLNB, which was diagnosed via SOZO®. All the patients, transient or persistent, were treated with a compression sleeve. Additionally, compared to the historical incidence of BCRL, which accounts for up to 40.4% in ethnic minorities, we found a significantly lower incidence of lymphedema ($p< 0.001$) in our patient population.

Conclusions: ARM procedure can significantly lower BCRL, even in ethnic minority groups. The combination of ARM and BIS led to a remarkably low BCRL rate of 1.4%, following SLNB and ALND. Furthermore, in our study, 1 patient with a crossover node and 2 patients undergoing adjuvant radiation therapy developed lymphedema, demonstrating the effectiveness of the ARM technique. However, in our study, 15 patients were diagnosed early with transient lymphedema via BIS and were promptly treated to prevent persistent lymphedema. Nevertheless, future studies with larger sample sizes and longer follow-up duration are necessary to bolster our findings.

Table 1: Demographic, axillary reverse mapping, and lymphedema data

Total Patients	212
Age, mean (SD)	57.4 (11.3)
Race/Ethnicity	
Asian	8 (3.8%)
African American	72 (34%)
White	23 (10.8%)
Hispanic	96 (45.3%)
Unknown	13 (6.1%)
BMI, mean (SD)	29.5 (5.7)
Laterality	
Left	98 (46.2%)
Right	114 (53.8 %)
Pathology	
DCIS	9 (4.2%)
IDC	174 (82.1%)
DCIS, IDC	3 (1.4%)
ILC / Mixed Pathology	26 (12.3%)
Stages	
0	9 (4.2%)
1	115 (54.2%)
2	56 (26.4%)
3	16 (7.5%)
4	5 (2.4%)
Unknown	11 (5.2%)
Receptor Status	
ER+	159 (75%)
PR+	135 (63.7%)
HER2+	44 (20.8%)
Triple Positive (ER+/PR+/HER2+)	22 (10.4%)
Triple Negative (ER-/PR-/HER2-)	34 (16%)
SLNB	177 (83.5%)
ALND	35 (16.5%)
Adjuvant Radiation Therapy (Median dose = 52.4 Gy)	132 (62.3%)
Nodal Radiation Therapy (Median dose = 50 Gy)	54 (40.9%)
Intraoperative Radiation Therapy (IORT) (Median dose = 20 Gy)	33 (15.6%)
Positive Nodes (Total)	67
1 – 4	55 (82.1%)
5 – 9	8 (11.9%)
10 +	4 (6%)
Blue Nodes Identified	47 (22.2%)
Blue Nodes Excised	32 (68.1%)
Crossover Nodes	17 (53.1%)
Number of Crossover Nodes that were Positive	7 (41.2%)
Blue Lymphatics Present	55 (25.9%)
Patient(s) with Persistent Lymphedema	3 (1.4%)
Patient(s) with Transient Lymphedema	15 (7%)
Lymphedema diagnoses on follow-up	**Number of patients (n=18)**
3-month	7 (38.9%)
6-month	4 (22.2%)
9-month	3 (16.7%)
15-month	1 (5.6%)
18-month	1 (5.6%)
21-month	1 (5.6%)
24-month	1 (5.6%)

1688210 - Timing of Breast Cancer-related Lymphedema Development Over Three Years: Observations from a Large, Prospective Randomized Screening Trial

Chirag Shah[1], John Boyages[2], Louise Koelmeyer[2], Steven Chen[3], Frank Vicini[4]

[1]Taussig Cancer Institute, Cleveland Clinic, Cleveland, OH, [2]Australian Lymphoedema Education, Research, and Treatment Program, Macquarie University, Sydney, New South Wales, Australia, [3]OasisMD, San Diego, CA, [4]Michigan Healthcare Partners, Farmington Hills, MI

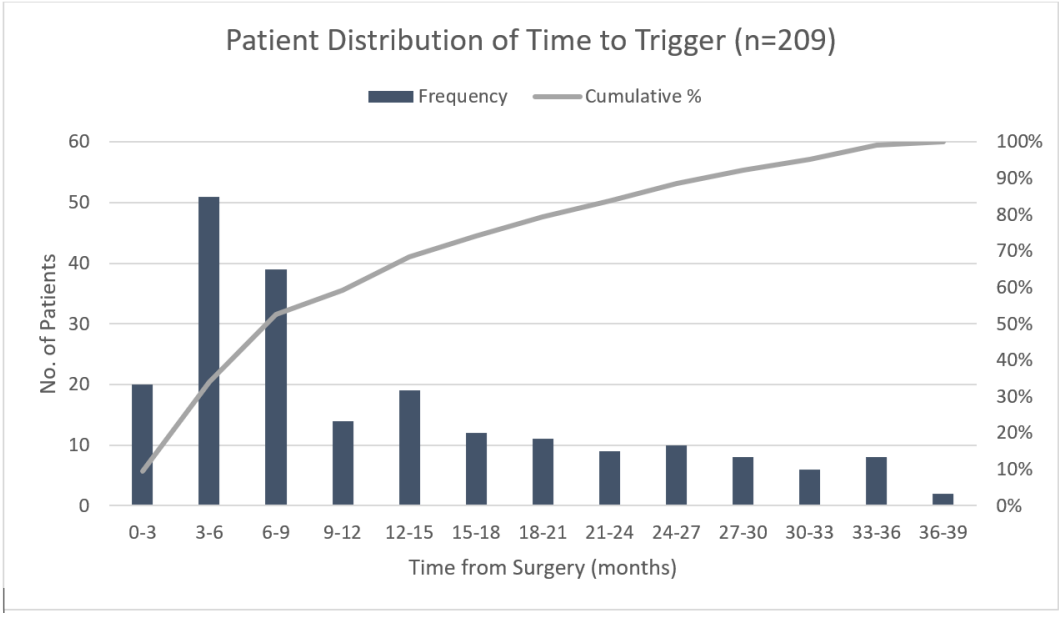
Background/Objective: The PREVENT randomized control trial monitored progression to chronic breast cancer-related lymphedema (cBCRL) following intervention for subclinical breast cancer-related lymphedema (sBCRL) assessed by both bioimpedance spectroscopy (BIS) or tape measure (TM). This secondary analysis reviews the timing of sBCRL triggering early intervention in the three years following breast cancer treatment.

Methods: As part of the PREVENT trial, 918 women at risk of developing cBCRL were evaluated at regular intervals including at baseline and then again at 3, 6, 12, 18, 24, 30 and 36 months after breast cancer treatment using either BIS (n=461) or TM (n=457) with optional visits at 15 and 18 months. sBCRL was defined as an increase in ≥6.5 L-Dex units from baseline for the BIS group or ≥5% and < 10% increase in volume difference from baseline for the TM group. Following diagnosis of sBCRL, patients underwent a four-week compression sleeve intervention. cBCRL was defined as ≥10% change in volume difference from baseline and resulted in referral to complex decongestive physiotherapy (CDP). The time in months from breast cancer treatment to lymphedema detection was calculated and reviewed at 3-month intervals.

Results: Median follow-up time was 35.6 months (IQR: 27.2 – 36.9). Over the duration of the study, 209 (22.8%) patients developed sBCRL with 89 patients in the BIS cohort (19.3%) and 120 in the TM cohort (26.3%) eligible for intervention. Of these, 30 patients progressed to cBCRL (BIS: 7 (7.9% of 89), TM: 23 (19.2% of 120)) post-intervention. In addition, 39 (4.2%) patients progressed to cBCRL without previously being identified with sBCRL between visits without receiving intervention and were subsequently referred directly to CDP. More than half of patients triggered (110 of 209 (52.6%)) within 9 months of breast cancer treatment. Patients continued to have sBCRL triggers regardless of screening method used for detection, out to 3 years post-surgery with rates remaining consistent in year two and three ($p>0.242$). Patients who progressed to cBCRL prior to intervention did so across the entire 3-year monitoring period.

Conclusions: The timing of sBCRL detection demonstrates that patients continue to be at risk for developing sBCRL years after treatment and thus may continue to progress to cBCRL even years after surgery. Early detection of sBCRL allows for early intervention for lymphedema that decreases the likelihood of progression to cBCRL. As such, patients should continue to be monitored for three years minimum following the completion of treatment. Over 50% of sBCRL detection occurred in the first 9 months after treatment suggesting the importance of careful targeted monitoring over this initial period.

Figure 1: Time to trigger



1684169 - An Insight into the Management and Follow-up of Male Breast Cancer Patients in the UK and Ireland

Daire Goodman[1], Laura Arthur[2], Sarah Barker[2], Michael Rees[3], Natalie Allen[4], Brendan Skelly[5], Alison Lannigan[6], Edel Quinn[7], Rajiv Dave[8], Daniel Glassman[9], Zahid Bahli[5], Michael Boland[10], Claire Rutherford[1]

[1]St Vincent's University Hospital, Dublin, Ireland, [2]Royal Alexandra Hospital, Paisley, Scotland, United Kingdom, [3]Cwm Taf Morgannwg University Health Board, Pontypridd, Wales, United Kingdom, [4]Bart's Health NHS Trust, London, England, United Kingdom, [5]Western Health and Social Care Trust, Derry, Northern Ireland, United Kingdom, [6]University Hospital Wishaw, Wishaw, Scotland, United Kingdom, [7]Cork University Hospital, Cork, Ireland, [8]Manchester University NHS Foundation Trust, Manchester, England, United Kingdom, [9]Mid Yorkshire Hospitals NHS Trust, Wakefield, England, United Kingdom, [10]St Vincent's University Hospital, Dublin, Ireland

Background/Objective: Male breast cancer (MBC) remains rare, accounting for < 1% of all breast cancers, < 1% of all new male cancer cases and 0.1% of male cancer deaths in the UK. Although overall incidence has not dramatically increased, men are still diagnosed at later stages and have a worse prognosis compared to women. The lifetime risk of breast cancer is roughly 1:8 for females while being much less frequent at 1:1000 for males with an average age of presentation at 62 years for women compared to 67 years for men. The mainstay of treatment for female breast cancer is surgical management which has evolved over the last 50 years from radical mastectomy to breast conserving surgeries including oncoplastic techniques and nipple-sparing mastectomy leading to improved cosmesis and patient satisfaction. However, despite these advances in the surgical management of female breast cancer there has not been the same trend towards breast conservation in MBC.

Methods: We conducted a cross-sectional study looking at MBC management amongst breast surgeons in the UK and Ireland to look for similarities and any regional variations in practice. This survey aimed to gain a better understanding of management and follow-up of this patient cohort. These questionnaires were disseminated online via the social media to members of the Mammary Fold, Association of Breast Surgeons and Society of Irish Breast Surgeons.

Results: We received responses from trainees and consultants from ten units across the UK and Ireland. 72.7% of responders reported managing 6 or fewer cases of MBC per year. 81.8% surgically managed MBC using mastectomy and axillary surgery (SLNB or ANC depending on staging) as standard, while only 18.2% offered breast conserving surgery where possible. 81.8% offered genetic testing to all MBC patients. In terms of follow-up, 36.4% followed MBC patients with annual clinical review only, 36.4% offered annual mammogram follow up only and 27.2% offered both annual clinical review with mammogram. 54.6% of respondents said their MBC patients were not offered MBC-specific information leaflets or reading materials. Only 27.3% of units offered or directed MBC patients to MBC-specific support groups.

Conclusions: There is considerable regional and national variation in the management of MBC. From a surgical perspective, the majority of MBC patients are offered mastectomy only despite emerging evidence that breast conserving surgery can be feasible within this group. With regards to genetic testing, this should be offered to all MBC patients due to the potential for genetic mutations. There is still a lack of consensus regarding follow-up as demonstrated in our survey results. There is evidence that MBC patients do not have access to the emotional or psychosocial support groups that are established for female breast cancer patients which is further evidenced by this survey. There is a need for standardisation of care and follow-up for MBC patients.

1683111 - Cutting It Close: Does Resident Involvement or PGY Level Impact Margin Status When Performing Lumpectomies

Kristina Fraser[1], Patty Tenofsky[2], Jared Reyes[2]

[1]University of Kansas School of Medicine-Wichita, Wichita, KS, [2]University of Kansas School of Medicine-Wichita, Wichita, KS; Ascension Via Christi Clinic, Wichita, KS

Background/Objective: In the practice of breast surgery, positive margins is a troublesome pathologic finding which has been associated with an increased risk of local recurrence, and the recommendation of further surgery that can lead to lower patient satisfaction and cosmetic outcomes and increased costs. Previous studies have looked into resident involvement and surgical outcomes; however, inconsistent results when it comes to resident involvement and margin status on breast cancer operations indicate there is need for further evaluation of resident involvement in these specific procedures.

Methods: After institutional review board (IRB) approval, a retrospective study was completed of adult female patients who underwent a lumpectomy by a single surgeon. The surgeries were categorized by whether a resident was involved or was not involved in the surgical procedure. Other variables including cancer type, grade, size, neoadjuvant chemotherapy use, and oncoplastic surgery were also assessed. Variables were evaluated to determine what contributed to a positive margin status.

Results: When comparing cases that involved a resident versus those that did not involve a resident, no statistically significant differences were noted in patient age (65.46 ± 1.76 years vs. 66.14 ± 9.31years, p=.560), neoadjuvant therapy (11.8% vs. 8.0%, p=.273), and tumor size (13mm vs. 13mm, p=.821). The number of cases with positive margins did not differ statistically when a resident was involved and when no resident was involved (20.3% vs. 16.7%, p=.420). PGY year was not found to be associated with margin status (P = 0.566). The only variables that were associated with increased positive margins was ductal adenocarcinoma mixed with DCIS and pure DCIS. Pure DCIS was associated with the greatest proportion of the positive margins.

Conclusions: The involvement of resident physicians in breast cancer surgery does not compromise the oncologic safety of partial mastectomies. Specifically , PG year did not significantly impact margin status. Unlike previous studies, our data showed that It was safe to involve all levels of residents in the surgical care of these patients. Surgical training can continue to involve surgical residents in breast surgery without fear of providing suboptimal care.

Table 1: Operative information and pathology findings by margin status

	Negative Margins (N=247)	Positive Margins (N=56)	p-value
Neoadjuvant Therapy (Y)	11.3% (28)	3.6% (2)	.079
Tumor Size			.029
T1	79.7% (185)$_a$	66.1% (37)$_b$	
>T1	20.3% (47)$_a$	33.9% (19)$_b$	
Reduction Lumpectomy	11.7% (29)	5.4% (3)	.160
Completion Mastectomy (Y)	0.8% (2)	19.6% (11)	<.001
Type of Tumor			<.001
Ductal	59.8% (147)$_a$	17.9% (10)$_b$	
Lobular	4.9% (12)	7.1% (4)	
Mixed Ductal and DCIS	17.1% (42)	26.8% (15)	
DCIS with LCIS	1.2% (3)	1.8% (1)	
Mixed Ductal and Lobular	2.0% (5)	5.4% (3)	
Pure DCIS	15.0% (37)$_a$	41.1% (23)$_b$	
ER Status			.608
Positive	82.6% (204)	85.5% (47)	
Negative	17.4% (43)	14.5% (8)	
PR Status			.796
Positive	70.9% (175)	69.1% (38)	
Negative	29.1% (72)	30.9% (17)	
Her2 Status			.695
Positive	6.9% (17)	3.6% (2)	
Negative	92.3% (227)	96.4% (53)	
Equivocal	0.8% (2)	0.0% (0)	
Resident Involved	49.4% (122)	55.4% (31)	.420
Tumor Grade			.925
1	29.9% (72)	30.8% (16)	
2	39.4% (95)	36.5% (19)	
3	30.7% (74)	32.7% (17)	
Ductal tumor	59.8% (147)	17.9% (10)	<.001
Pure DCIS tumor	15.0% (37)	41.1% (23)	<.001

1678913 - Evaluating the Effect of MarginProbe Use on Partial Mastectomy Re-excision Rates: A Single Institution Analysis

Victoria Haney[1], Margaret Klein[2], Brittany Pearson[3], Anita McSwain[1], Christine Teal[1]

[1]The George Washington University Hospital, Washington, DC, [2]The George Washington University School of Medicine, Washington, DC, [3]The George Washington University, Washington, DC

Background/Objective: Breast conservation therapy is a well-established standard of care in the management of breast cancer. Despite advancements in breast cancer surgery, partial mastectomy re-excision rates for positive margins on final pathology are approximately 20%. MarginProbe is an FDA-approved radiofrequency spectroscopy device used for intraoperative margin assessment, which has been shown in some studies to decrease partial mastectomy re-excision rates. A pilot study we conducted from 2019-2021 showed promising results with decreased re-excision rates with MarginProbe use. This study aimed to expand on the pilot study and compare re-excision rates between groups with and without MarginProbe use.

Methods: Patients from a single institution with newly diagnosed breast cancer undergoing partial mastectomy without neoadjuvant chemotherapy were identified. Patients in the prospective cohort, in which MarginProbe was used during partial mastectomy, were enrolled from June 2019 to July 2023. A retrospective control group of patients undergoing partial mastectomy without MarginProbe use from January 2015 to May 2019 was identified. All procedures in both cohorts were performed by the same two breast surgeons. Efficacy of the MarginProbe device was evaluated by comparing re-excision rates in the control group, which received standard of care (SOC) intra-operative margin assessment with specimen radiographs or gross sectioning at the time of surgery, to the re-excision rates in the MarginProbe group. Positive margins were defined as tumor on ink for invasive cancer and within 2mm of the margin for ductal carcinoma in situ (DCIS).

Results: 152 patients, including one requiring bilateral excisions for a total of 153 cases, were enrolled in the prospective MarginProbe device group. 300 patients were included in the retrospective control group. 41 (27%) of the 153 cases in the MarginProbe device group underwent re-excisions, while 113 (38%) of the 300 patients in the control group required re-excision based on SOC. Implementation of the MarginProbe was associated with a 10.7% absolute reduction in re-excision rate and a 28.4% relative reduction in re-excision rate (p=0.0214). MarginProbe had a 70.1% sensitivity for detection of all positive margins. In 47 shavings from 29 patients, the use of MarginProbe led to detection of malignant tissue for which the main specimen was pathologically clear. MarginProbe use added an average of 13.9cc additional tissue removed during partial mastectomy.

Conclusions: MarginProbe use was associated with a statistically significant decrease in re-excision rate following partial mastectomy, while only removing a small amount of additional tissue. Our results demonstrate that MarginProbe is an effective intraoperative adjunct to help surgeons identify areas that might require re-excision, ultimately reducing the number of operations patients require given the inherent risk of surgery. Further, in 29 patients, MarginProbe use led to malignant tissue removal in shave margins that would have otherwise remained in situ due to negative pathologic margins on the main specimen. As with any medical device, there are limitations to its use, particularly in cases with dense breast tissue. Future studies are necessary to continue to improve the sensitivity of MarginProbe and to refine its clinical application.

1688255 - A Systematic Review and Meta-analysis of Intraoperative Margin Detection Systems in Breast-conserving Surgery

Christos Costa[1], Yi Ting Yu[2], Alessandro Olivo[3], Andreas Papazoglou[4], Mehran Habibi[5], James S Michaelson[6], Daniel Leff[1], James C Weaver[7]

[1]Imperial College London, London, England, United Kingdom, [2]Queen Mary University of London, London, England, United Kingdom, [3]University College London, London, England, United Kingdom, [4]Athens Naval Hospital, Kamatero, Attiki, Greece, [5]Staten Island University Uospital, Northwell Health, Staten Island, NY, [6]Harvard Medical School and Massachusetts General Hospital, Massachusetts, MA, [7]Wyss Institute of Biology, Harvard University, Cambridge, MA

Background/Objective: Imprecision in breast conserving surgery (BCS) results in high national average rates of re-operative intervention due to close positive resection margins. Internationally, re-operative intervention for failed BCS range between 9% to 36%(1). Re-operative intervention increases the risk of perioperative complications, imposes a substantial economic burden on patients and providers(2). Intraoperative margin detection systems may reduce re-

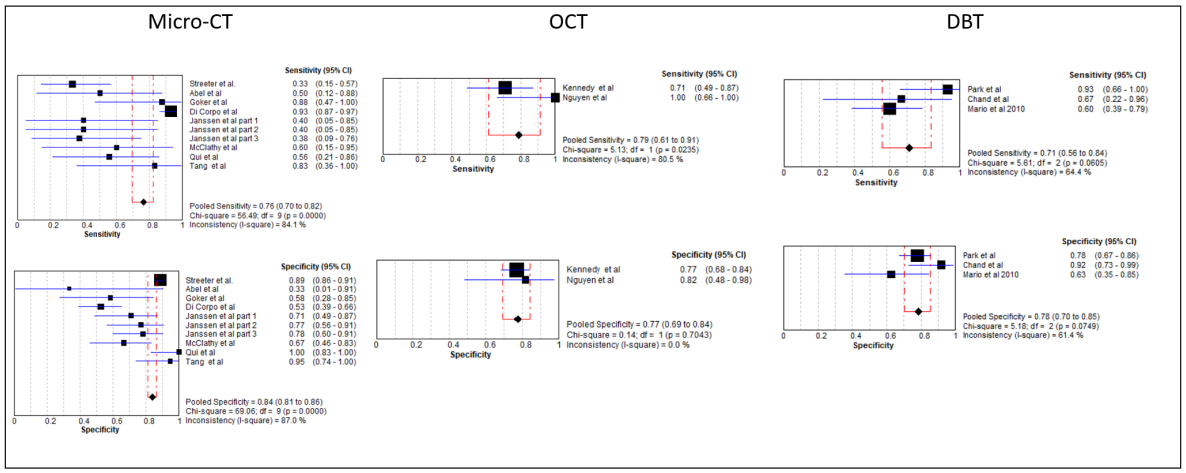
operative intervention. Conventional techniques such as frozen section analysis and cytology are both labour intensive and time-consuming. Specimen imaging techniques offer an alternative, permitting real-time assessment of tissue during surgery to confirm positive margins. Several modalities have been explored in the literature, including conventional X-ray, micro-CT, Digital Breast Tomosynthesis (DBT), micro MRI, and PET scans(3,4). The study objective was to conduct a systematic review / meta-analysis of the diagnostic accuracy of specimen imaging modalities.

Methods: A systematic review was undertaken in accordance with PRISMA guidelines, encompassing original research articles that utilized specimen imaging modalities: MRI, microCT, PET, and DBT for intraoperative assessment of oncological margin status in breast cancer conserving surgery and subsequently compared their findings with the established histological gold standard. The systematic literature search was conducted using COVIDENCE® software (Melbourne, Australia). The primary endpoints of interest included the evaluation of sensitivity, specificity, and positive predictive value (PPV) of imaging techniques in comparison to the established gold standard, histology. A pooled meta-analysis was conducted using SPSS® software (IBM version 29, Chicago, USA) and the results were depicted using forest plots produced using Meta- DiSC (version 2.0 Nijmegen, Netherland.) Positive margin rate was also calculated using the calculation (true positive + false negative) divided by the total sample size.

Results: A total of 15 studies was included, encompassing 1419 patients undergoing BCS using specimen imaging for margin assessment. In total, 8 studies used micro CT portraying: pooled sensitivity 76% (70%-80%), I2=84.1% , pooled specificity 84% (81%-86%) I2=84%, PPV μ=49.1% (+/- 29.8%), PMR μ=29.9% (+/- 21.4%). For micro CT Area Under the Curve (AUC) was 0.78. Regarding OCT: pooled sensitivity 79% (61%-91%), I2=81%, pooled specificity 77% (69%-84%), PPV μ=60.0% (+/- 31.1%), PMR μ=25.5% (+/- 1.7%). Three studies used DBT results with mean results: pooled sensitivity 71% (56%-84%) I2=64.4%, pooled specificity 78% (70%-85%) I2 =61.4%, PPV μ=59.7% (+/-16.3%), PMR μ=39.8% (+/- 20.9%).

Conclusions: The evidence supports the notion that imaging modalities are highly accurate for detection of intraoperative positive margins. Randomised trial data is required before it can be certain that the systems are able to mitigate re-operative procedures. Prospective studies that concentrate on distinct tumour types and patient demographics, along with the exploration of advanced imaging devices, should be pursued to fortify the existing evidence base. References: 1. Brouwer de Koning SG et al. Tumor Resection Margin Definitions in Breast-Conserving Surgery. Clin Breast Cancer. 2018 Aug;18 2. Grant Y, Al-Khudairi R et al. Patient-level costs in margin re-excision for breast-conserving surgery. British Journal of Surgery. 2019 Feb 27 3. Ha R et al. OCT: Novel Imagin method post lampectomy. Acad Radiol. 2018 Mar 4. Göker et al. Micro-PET/CT for intra-operative margin assessment during BCS Acta Chir Belg. 2020 Oct

Figure 1: Forest plots of sensitivity and specificity of imaging modalities compared to gold standard histopathology



1688542 - Relationship Between Margin Width and Local Recurrence Following Breast-conserving Surgery for Invasive Breast Cancer – A Meta-analysis

Ahmed Ezzat[1], Dhurka Shanthakumar[2], Naomi Laskar[2], Ramsey I Cutress[3], Michael Boland[2], Meera Joshi[2], Ronak Patel[2], Yasmin Grant[2], Ravi Naik[2], Nur A Che Bakri[2], Saur Hajev[2], Hussein Elghazaly[4], Josephine Holt[5], Dimitri Hadjiminas[6], Ara Darzi[2], Hutan Ashrafian[2], Daniel Leff[2]

[1]Imperial College, London, England, United Kingdom, [2]Imperial College London, London, England, United Kingdom, [3]University of Southampton and University Hospital Southampton, Southampton, England, United Kingdom, [4]Imperial College NHS Trust, London, England, United Kingdom, [5]Royal Free London NHS Trust, London, England, United Kingdom, [6]Imperial NHS Trust, London, England, United Kingdom

Background/Objective: Defining an adequate margin width following breast conserving surgery (BCS) remains controversial without international consensus. The Association of Breast Surgery in the United Kingdom recommends a minimum clearance of 1mm from invasive disease to resection margin, whereas the American Society of Clinical Oncology (ASCO), accepts "no tumour on ink". Both recommend adjuvant breast radiotherapy following BCS. With a hazard meta-analysis, Bundred 2022 suggests 'no tumour on ink' is insufficient for excision, and a minimum 1 mm clear margin was recommended. Hazard ratios are difficult to clinically interpret and communicate to patients in quantifying the level of risk for local recurrence (LR). Our aim was to systematically review and meta-analyse all the evidence to date for odds ratio (OR), relative risk (RR) and hazard ratio (HR) outcomes of LR based on varying margin widths.

Methods: The systematic review was registered on PROSPERO (CRD42022308524). An electronic search using Medline and Embase was performed on 28/9/23 using search terms including "ductal", "breast", "carcinoma/tumour/neoplasm", "margin". Covidence software (Veritas Health Innovation, Melbourne, Australia) was used to screen 2644 abstracts. Inclusion criteria were a clear definition of margin width; minimum of 48 months follow up; and adjuvant whole breast radiotherapy. Demographics, tumour characteristics and systemic therapy were included. Raw LR data were used to compute adjusted odds ratio (OR) and relative risk (RR). Where possible, data was adjusted for neoadjuvant and adjuvant chemotherapy, and boost radiotherapy. A hazard ratio (HR) meta-analysis was performed. A direct inference of LR between 0.1-1mm vs >2mm margin was not possible due to insufficient data.

Results: Overall 99,390 patients from 75 studies were systematically reviewed. 34 of the 75 studies (57,864 patients) presented sufficient data to calculate pooled OR and RR of local recurrence across different margin widths. Pooled HR of LR could be calculated from 23 primary studies of 60,058 patients. Overall 5 year local recurrence was 2150/57,864 (3.72%).. Overall, 'tumour on ink' vs any margin width was associated with the highest risk of LR, compared with 0.1-1mm vs >1mm (HR=0.69 95%CI (0.45, 0.93), OR= 1.51 95%CI (0.85,2.68),RR=0.99 95%CI (0.80,1.18) and 0.1-2mm vs >2mm margin clearance (HR=1.41 95%CI (0.93,1.90),OR=1.80 95%CI (1.24,2.60),RR=0.75 95%CI (0.64, 0.87)) Tumour on ink vs >1mm negative margin showed the largest risk of LR(HR= 3.01 95%CI (1.31, 4.71), OR=4.32 95%CI (3.40,5.49), RR=3.73 95%CI (2.89, 4.58). Data is presented in Table 1.

Conclusions: The current analysis suggests a trend towards lower risk of LR with wider negative margin clearance. In the worst case, a patient with a margin clearance within 0.1-1mm from tumour may have up to 2.68 times the LR risk, compared with a negative margin wider than 1 mm. Therefore, this analysis calls into question universal acceptability of no tumour on ink during BCS for complete excision of invasive disease. The analysis may be confounded by variability in boost radiotherapy use and dosage, especially within narrower margins: no tumour on ink and 0.1-1mm margins.

Table 1: Summary of pooled risk scores for ipsilateral locally recurrent breast cancer based on varying threshold of resection margin width

Margin Width	Pooled HR 95%CI (IQ range)	Pooled OR 95%CI (IQ range)	Pooled RR 95%CI (IQ range)
	23 studies, 60,058 patients	**34 studies, 57,864 patients**	
Tumour on ink vs No tumour on ink	1.42 (1.07, 1.77) p= <0.0005 I^2=59.2%	2.56 (1.39,4.73) p=0.003 I^2 =95.8%	1.44 (1.16,1.72) p= <0.0005 I^2 =86.2%
Tumour on ink vs >1mm	3.01 (1.31, 4.71) p=0.001 I^2 =80.1%	4.32 (3.40,5.49) p= <0.0005 I^2 =46.8%	3.73 (2.89, 4.58) p= <0.0005 I^2 =72.0%
Tumour on ink vs >2 mm	2.53 (1.44,3.63) p p= <0.0005 I^2 =80.1%	1.81 (0.99,3.34) p=0.055 I^2 =96.6%	0.46 (0.35,0.56) p= <0.0005 I^2 =98.4%
0.1-1mm vs >1mm	0.69 (0.45, 0.93) p= <0.0005 I^2 =94%	1.51 (0.85,2.68) p=0.165 I^2 =95.3%	0.99 (0.80, 1.18) p= <0.0005 I^2 =83.2%
0.1-2mm vs >2 mm	1.41 (0.93,1.90) p= <0.0005 I^2 =64.1%	1.80 (1.24,2.60) p=0.002 I^2 =93.4%	0.75 (0.64, 0.87) p= <0.0005 I^2 =89.7%

Table 1 Legend. I^2 =sample heterogeneity score, p= probability sig. <0.05, HR=hazard ratio (Total studies=23, total study patients=60,058), OR=odds ratio and RR=relative risk (Total studies=34, total study patients=57,864).

1641682 - Nipple-sparing Mastectomy and Adequate Margins for Patients with DCIS

Kristina Shaffer[1], Lilian Harris[2], Stephanie Ng[3], Judy Tjoe[4]

[1]Novant Health, University of North Carolina School of Medicine, Charlotte, NC, [2]Novant Health, Charlotte, NC, [3]Women and Infants Hospital of Rhode Island, Program in Women's Oncology, Gynecologic Oncology and Breast Surgery, The Warren Alpert Medical School of Brown University, Providence, RI, [4]Novant Health, Greensboro, NC

Background/Objective: In contrast to breast conservation surgery (BCS) margin recommendations, there are currently no specific margin guidelines in patients undergoing mastectomy. For BCS patients with ductal carcinoma in situ (DCIS), existing guidelines advise a margin width of at least 2mm, with studies demonstrating a decreased risk of recurrence compared to a more narrow margin. However, limited data exist to establish if this margin is also appropriate in the mastectomy setting, and specifically in patients undergoing nipple-sparing mastectomy (NSM). Consequently, we evaluated the margin status of patients undergoing NSM for DCIS, adjuvant therapies, and resulting oncologic outcomes.

Methods: A single-institution retrospective review was performed in patients who underwent NSM for a diagnosis of DCIS or DCIS with microinvasion (DCIS+MI) from April 2010 to December 2021. Patient and tumor characteristics, margin status, treatment, and outcomes information were collected. The association between margin status and local-regional (LRR) and distant recurrence (DR) were examined.

Results: 161 patients were included, comprising 284 NSM, 164 of which were therapeutic and 120 prophylactic. 153 patients had DCIS and 8 had DCIS+MI. Most patients had estrogen-receptor positive (ER+) disease, 124 (77%), and were nuclear grade 2, 70 (43.5%). A total of 35 patients had a positive or < 2mm margin. Of these, 20 (57.1%) involved the anterior margin. At a median follow-up of 45 months (range 0-151), 2.5% (n=4) had a LRR and 0.6% (n=1) had a DR. Of patients with a recurrence, only 2 had a positive or < 2mm margin, 1 had received endocrine therapy, and neither had received adjuvant radiation.

Conclusions: No specific margin status was found to correlate with recurrence risk for patients with DCIS or DCIS+MI undergoing NSM, with an altogether low recurrence risk. Overall, this suggests that recommended DCIS margins for patients undergoing BCS does not necessarily apply in patients undergoing NSM, where margins of < 2mm may be acceptable.

1683561 - Nodal Imaging and Pathologic Response After Neoadjuvant Immunotherapy for Node-positive Breast Cancer

Jennifer Carroll, Tanya Hoskin, Tina Hieken

Mayo Clinic, Rochester, MN

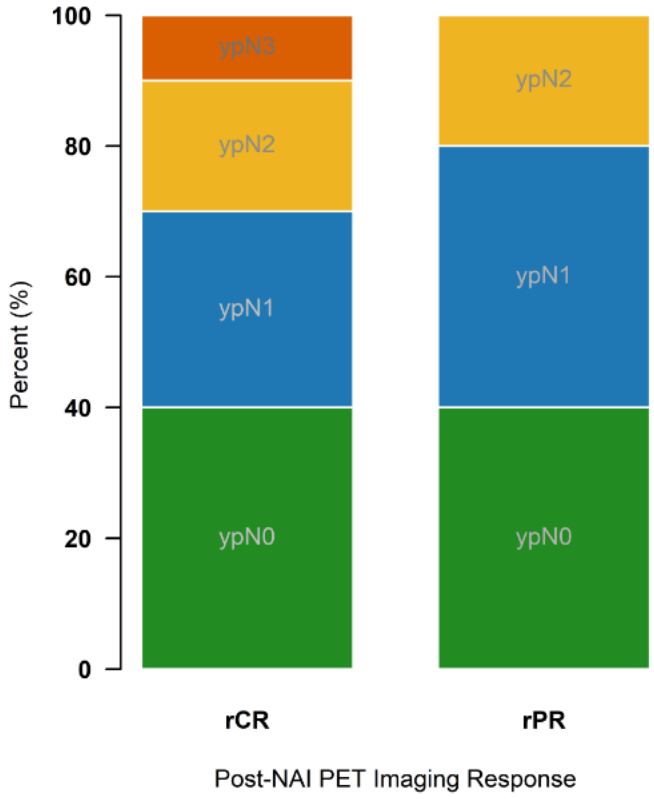
Background/Objective: Patients with node-positive ER/PR/HER2-negative breast cancer generally are treated with neoadjuvant systemic therapy. Recent clinical trials adding neoadjuvant immunotherapy (NAI) to the systemic regimen for these patients has led to FDA approvals based on a higher pathologic complete response (pCR) rate compared to chemotherapy without immunotherapy. PET-CT is frequently used for staging at diagnosis and to re-stage and assess response after neoadjuvant treatment. However, NAI, given to boost anti-tumor immunity, may drive a proliferative T cell response in lymph nodes which may be confused with progression, particularly in the setting of node-positive disease. A lack of concordance between PET-CT nodal imaging findings and pathologic response to NAI has been reported for other tumors, however no data yet exist for NAI-treated node-positive breast cancer patients. Thus we evaluated pre- and post-NAI PET-CT findings to determine whether imaging findings accurately represent postoperative pathologic nodal status.

Methods: With IRB approval, from our prospective surgery database, we identified node-positive breast cancer patients treated with NAI, operated on 1/2020-10/2023, and evaluated with PET-CT before and after NAI. Statistical analysis was performed using Fisher's exact and Wilcoxon rank-sum tests.

Results: Fifteen patients, median age 51 years (range: 36-85 years), met inclusion criteria. At presentation 7 patients had cN1 (47%), 1 cN2 (7%) and 7 (47%) cN3 disease. The median pre-treatment SUVmax of the most FDG-avid lymph node was 11.0 (range: 4.2-24.1). After NAI 10 patients (67%) had a radiographic complete response (rCR) and 5 (33%) a radiographic partial response (rPR). Hilar adenopathy developed post-NAI in 3 (20%) patients, 2 of whom had a nodal pCR. Post-NAI median SUVmax of the most FDG-avid lymph node was 1.7 (range: 1.0-4.2). At operation 6 patients (40%) had a nodal pCR, whereas 5 (33%) had ypN1, 3 (20%) ypN2 and 1 (7%) ypN3 residual disease. There was no difference in nodal pCR rates between patients with a rCR (4/10, 40%) versus rPR (2/5, 40%), p=1.0, detailed in Figure). Post-NAI SUVmax also was not associated with pathologic nodal status (median 1.7 for those with versus 1.6 for those without a nodal pCR, p=0.82). Among all ypN+ patients, the median number of positive nodes was 4 (range: 1-17) and the median greatest linear extent of nodal disease was 9.0 mm (range: 1.2-22.0 mm). Stratified by radiographic response, the median number of positive nodes was 6 (range: 1-17) for patients with rCR and median 2 (range: 1-4) for patients with rPR (p=0.33) while the median greatest linear nodal metastasis size was 9.5 mm (range: 1.2-22.0 mm) for patients with rCR versus 6.0 mm (range: 4.0-9.0 mm) for patients with rPR (p=0.46).

Conclusions: We found no correlation between nodal PET-CT findings post-NAI and pathologic nodal status at operation. While this restaging is valuable for detecting clinically occult distant metastatic disease, it is of limited utility for predicting pathologic nodal status. While larger prospective studies and imaging response criteria specific for assessment of operable nodal disease are both warranted, surgical nodal staging with pathologic evaluation remains important to assess treatment response and guide care.

Figure 1: Pathologic nodal status by radiographic nodal response to neoadjuvant immunotherapy



1688823 - The Role of Tumor-associated Macrophages in the Response to Neoadjuvant Chemotherapy for Hormone-positive Breast Cancer

Gizem Oner[1], Christophe Van Berckelaer[1], Marleen Praet[1], Karen Zwaenepoel[1], Nuh Zafer Canturk[2], Sevilay Altintas[1], Wiebren Tjalma[1], Zwi Berneman[1], Marc Peeters[1], Patrick Pauwels[1], Peter A van Dam[1]

[1]Antwerpen University Hospital, Antwerpen, Belgium, [2]Kocaeli University School of Medicine, Kocaeli, Turkey

Background/Objective: Tumor-associated macrophages (TAMs) constitute an important part of the tumor microenvironment of breast cancer and they play an essential role in tumor progression and metastasis. However, the role of TAMs in neoadjuvant chemotherapy (NAC) is unclear and need to be identified in estrogen receptor positive (ER+) / HER-2 negative breast cancer (BC). The aim of this study is to investigate the role of TAMs in the response to NAC in ER+/HER-2 negative BC.

Methods: Expression of TAMs was examined immunohistochemically, pre- and post- NAC in a cohort of 50 ER+/ HER-2 negative BC patients. All the patients received 4 to 8 cycles of NAC and the treatment consisted of anthracycline- and taxane-based regimens. Following NAC, mastectomy or breast conserving surgery were performed. Immunohistochemical staining with monoclonal antibodies for CD68 and CD163 were performed. All staining procedures were done according to validated protocols and scoring was done by a pathologist specialised in breast cancer. Positivity was defined as staining > 1% in stromal tissue compartments. Response to NAC was evaluated according to tumour size change on imaging and Ki-67 change.

Results: Results: The median age was 57.2 (31–73) years. Diameter of tumour size decreased with a mean of 7.3 mm (-76mm- 37mm) ($p< 0.001$) during NAC and the value of Ki-67 value decreased with a median of 12 after NET ($p< 0.001$). CD68 expression decreased after NAC, but this was not statistically significant. On the other hand, CD163 expression after NAC significantly decreased ($p< 0.001$) and a decrease in tumour size was found to correlate with the change in CD163 expression. Additionally, expression of CD163 tumor-associated macrophages before NAC were positively correlated with better NAC responses. No correlation was detected between CD68, CD163 and Ki-67.

Conclusions: TAMs may play an important role in the NAC response in ER+/HER-2 negative BC. Further research is imperative to improve our understanding of the clinical usefulness of TAMs particularly in the ER+/ HER-2 negative BC subtype.

Table 1: Patient and tumor characteristics of the study population

Patients Characteristics (N=50)		BEFORE – NAC n (%)	AFTER- NAC n (%)
Median age	57.2 years (31–73 years)		
Menopausal status	*Premenopausal*	19 (38)	
	Postmenopausal	31 (62)	
Tumour size (TNM – cT- ypT)	*T0*	-	3 (6)
	T1	-	20 (40)
	T2	26 (52)	16 (32)
	T3	19 (38)	10 (20)
	T4	5 (10)	1 (2)
Nodal status (TNM – cN- ypN)	*N0*	20 (40)	25 (50)
	N1	23 (46)	23 (46)
	N2	6 (12)	2 (4)
	N3	1 (2)	-
Nuclear Grade	*G1*	13 (26)	
	G2	24 (48)	
	G3	7 (14)	
	Unknown	6 (12)	
sTIL	<10% (category 1)	36 (72)	41 (82)
	≥10–40% (category 2)	9 (18)	6 (12)
	≥ 40% (category 3)	5 (10)	-
Residual Cancer Burden Category	RCB-pCR		3(6)
	RCB-I		4 (8)
	RCB-II		26 (52)
	RCB-III		15 (30)

1688548 - Effect of NET Duration on Residual Cellularity of HR-positive Breast Cancer

Amanda Sutherland Beck[1], Jacqueline Tsai[2], Megan Troxell[2], Irene Wapnir[2]

[1]Stanford University, Sunnyvale, CA, [2]Stanford University, Stanford, CA

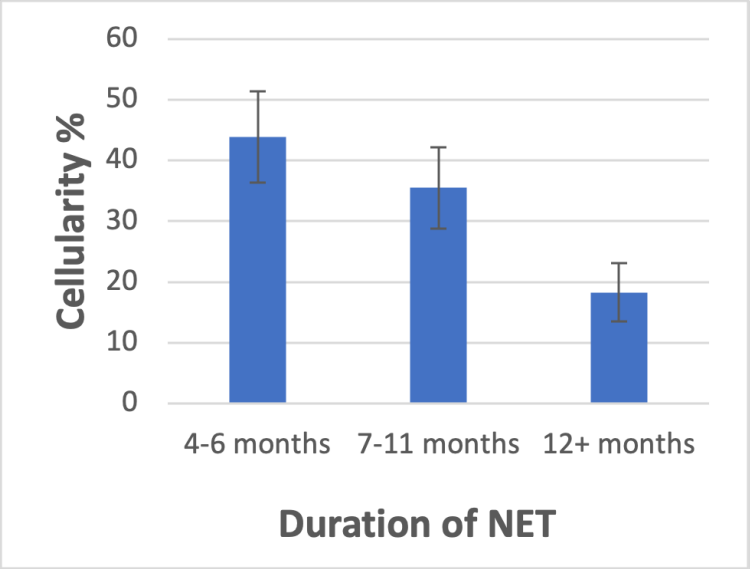
Background/Objective: Neoadjuvant endocrine therapy (NET) for the treatment of hormone receptor (HR) positive breast cancer is a viable option to downstage tumors prior to surgical intervention. Previous studies have shown potential benefit with increased duration of treatment. However, the ideal duration of treatment has yet to be defined. We hypothesized that greater duration time would result in decreased residual tumor cellularity at the time of surgery.

Methods: A retrospective review was performed of patients who received NET for HR positive disease between 2012 and 2023. Patients were excluded if they were treated with NET for less than two months. Patients were grouped by duration of NET; 4-6 months, 7-11 months, and 12 months or greater. Statistical analysis was performed using GraphPad Prism software. A P value of < 0.05 was considered significant.

Results: 46 patients who received NET were included. The average age of the cohort was 65.3 years (43-83), the average treatment duration was 9.7 months (4-37), and the average residual cellularity was 33.5% (1-99). 14 patients received NET for 4-6 months, 20 patients received NET for 7-11 months and 12 patients received NET for 12 months or greater. Patients treated with NET for 12 months or greater had an average residual cellularity of 18.3% □ 4.8% while those treated for less than 6 months had average residual cellularity of 43.9%□7.5% and those treated for 7-11 months had 35.5%□6.7% (p=0.05) (Figure 1). There was an approximately 2.4 times decrease in cellularity in patients treater for greater than 12 months compared to those treated for 4-6 months. All patients treated for 12 months or greater underwent breast conserving therapy (BCT) compared to 79% and 70% of those treated for less than 6 months or for 7-11 months respectively.

Conclusions: Greater duration of NET resulted in decreased residual cellularity and higher rates of BCT. When treating patients with NET the duration of treatment should be at least 12 months for the greatest benefit. Further investigation with larger sample size is warranted in the future.

Figure 1.



1684746 - Comparing Outcomes of Neoadjuvant Chemotherapy versus Surgery First in Patients with HER2-positive Breast Cancer: A National Cancer Database Study

Bobby May[1], Tyler Jones[1], Samantha Thomas[2], Jessica Limberg[1], Astrid Botty van den Bruele[1], Jennifer Plichta[1], Gayle DiLalla[3], Shelley Hwang[1], Akiko Chiba[1]

[1]Duke University Medical Center, Durham, NC, [2]Duke Cancer Institute, Durham, NC, [3]Duke University Medical Center, Raleigh, NC

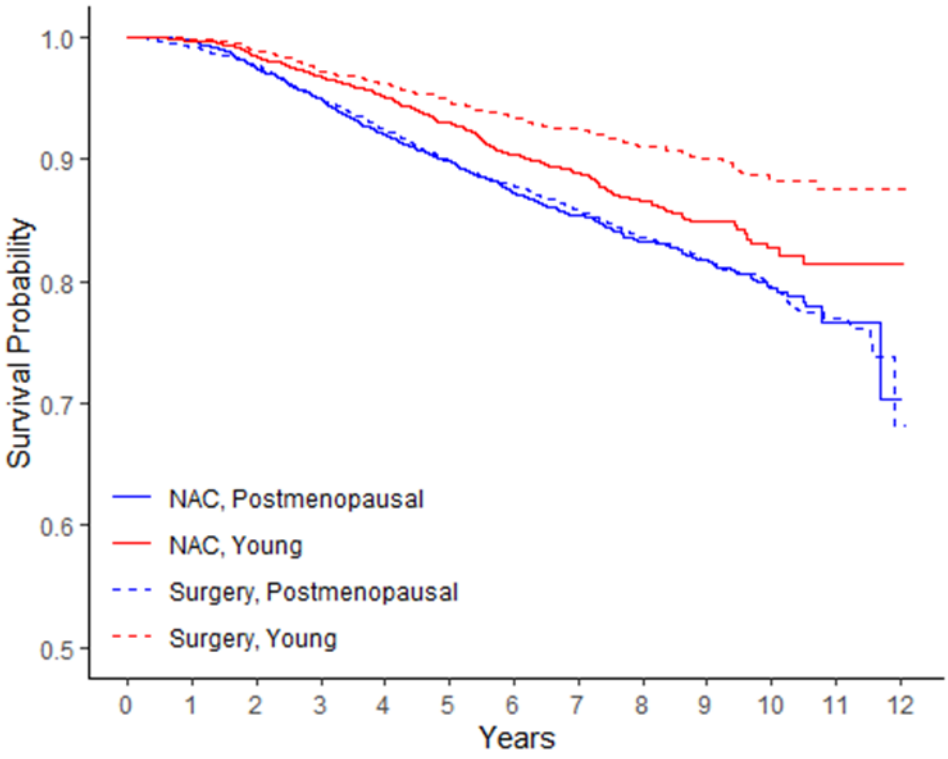
Background/Objective: Historical studies have demonstrated equivalent overall survival (OS) and breast cancer-specific survival between patients who underwent neoadjuvant chemotherapy (NAC) followed by surgery and those who underwent surgery first followed by adjuvant chemotherapy. Contemporary treatment for HER2+ disease has evolved, including the implementation of dual anti-HER2 therapy, with an improvement in rates of pathologic complete response (pCR). There is little contemporary data comparing survival outcomes of the treatment sequence (NAC vs upfront surgery) among young, premenopausal (18-40 years of age) and older, postmenopausal (55-65 years of age) patients. We explored potential differences in outcomes among young vs. postmenopausal patients when comparing NAC versus surgery first in operable, non-metastatic HER2+ invasive breast cancer.

Methods: Patients aged 18-40 (young) and 55-65 (postmenopausal) with clinical stages >cT2 and/or >cN1 HER2+ invasive, non-metastatic breast cancer who underwent surgery and received chemotherapy were selected from the National Cancer Database between 2010-2019. Patients were stratified by age group and treatment sequence. Unadjusted OS was estimated using the Kaplan-Meier method. Univariate Cox proportional hazards models were used to identify factors associated with OS, and an adjusted Cox proportional hazards model was used to estimate the association between OS and NAC vs surgery first and age after adjustment for available covariates.

Results: The study included 18,770 patients with >cT2 and/or >cN1 HER2+ breast cancer (32% young, 38% postmenopausal). 34% (n=6408) of cancers were estrogen receptor (ER) and progesterone receptor (PR) negative, and 46% (n=8598) were ER/PR positive. 2.5% (n=403) of cancers were identified as low grade, 65% (n=10,625) as high grade, and 13% (n=2530) as not being identified. Among young patients, approximately 50% (n=2973) received NAC and 50% (n=3019) received surgery first. Among postmenopausal patients, 42% (n=5397) received NAC and 58% (n=7381) received surgery first. Postmenopausal patients had a worse 5-year OS (95% CI) than young patients, regardless if they received NAC (89.8%, 95% CI 0.890, 0.907) or surgery first (89.8%, 95% CI 0.891, 0.906) (overall log-rank p-value < 0.001). Young patients who received surgery first had a greater 5-year OS at 94.8% (95% CI 0.939, 0.956) than young patients who received NAC (92.9%, 95% CI 0.920, 0.939) (Figure). Patients who received NAC followed by mastectomy had a worse OS compared to those who underwent mastectomy first (5y OS rates 88.7% vs 90.3%; log-rank p< 0.001). Patients who received NAC followed by breast conservation (BCT) had a slightly improved OS compared to those who underwent BCT followed by chemotherapy (5y OS rates 94.3% vs 92.8%; log-rank p< 0.001). After adjustment for demographic and tumor characteristics, a worse OS remained associated with NAC receipt compared to surgery first (HR 1.65, 95% CI 1.47-1.85, p< 0.001) and postmenopausal compared to young (HR 1.40, 95% CI 1.25-1.58, p=0.001).

Conclusions: The findings from this study suggest a difference in OS among young and postmenopausal patients with HER2+ invasive breast cancer, with younger patients having better survival outcomes compared to postmenopausal patients, regardless of treatment sequence. This study also suggests a difference in survival within the young patient cohort, with surgery first having a higher OS.

Figure 1: Overall survival stratified by treatment sequence and patient age group



1686395 - Breast Conservation Rate in Patients with Early-stage Triple-negative Breast Cancer Following Neoadjuvant KEYNOTE-522 Regimen

Casey Connors[1], Ayat ElSherif[2], Lauren Kopicky[3], Paula Escobar[3], Erin Roesch[3], Patrick McIntire[3], Julie Ritner[3], Tu Chao[3], Stephanie Valente[3], Julie Lang[3]

[1]Cleveland Clinic, Fairlawn, OH, [2]Cleveland Clinic Foundation, Cleveland, OH, [3]Cleveland Clinic, Cleveland, OH

Background/Objective: Patients with triple-negative breast cancer (TNBC) undergoing chemoimmunotherapy with the KEYNOTE-522 regimen are expected to have a pathologic complete response (pCR) rate of 65%. With the exceptional pCR rates in these patients, one would anticipate an improved clinical response thus increasing the rate of breast conservation therapy (BCT). The aim of our study was to determine if KEYNOTE-522 regimen has led to an increased rate of BCT in patients with TNBC compared to those who underwent neoadjuvant therapy (NAT) with non-KEYNOTE-522 regimen.

Methods: Data was retrospectively extracted from a prospectively maintained tumor registry database. All female patients with Stage II-III TNBC diagnosed between 2019-2022 who underwent NAT and subsequent surgical intervention were included. Univariate analysis was performed using two-tailed chi-squared test.

Results: A total of 241 patients were identified. The median age at diagnosis was 56 years (range 30-87). Racial groups included Caucasian (n=182), African American (n=48), Hispanic (n=6), Asian (n=3) and American Indian or Alaskan native (n=2). There were 85 patients identified as having undergone KEYNOTE-522 NAT and 156 who underwent alternative non-KEYNOTE NAT. In the KEYNOTE-522 cohort, the pCR rate was significantly higher at 57% (48/85) compared to that of the non-KEYNOTE group pCR rate of 33% (52/156) (p= 0.0006). There was no significant difference in the BCT rate of 27% (23/85) and 32% (50/156) in the KEYNOTE-522 and non-KEYNOTE groups, respectively (p= 0.47). Median overall survival (OS) in the KEYNOTE-522 group at 1.53 years was 95.3% and in the non-KEYNOTE group OS at 2.28 years was 85.3%. Genetic testing was performed on 198 patients of which 20.2% (40/198) were found to harbor genetic mutations including BRCA1, BRCA2, PALB2, CHEK2, ATM, RAD51D and RNF43. In the subset of patients with a BRCA1 mutation, a pCR rate of 75% was identified in both NAT groups. This pCR rate was higher when compared to the non-BRCA1 carrier group undergoing non-KEYNOTE (9/12) (p= 0.006) and KEYNOTE-522 (3/4) (p= 0.63) regimens.

Conclusions: The KEYNOTE-522 regimen produced a statistically significant improvement in pCR rate compared to non-KEYNOTE regimen, however, there was no improvement in BCT. Further evaluation of pre-operative imaging status-post NAT may help determine patient eligibility for BCT in those treated with KEYNOTE-522 regimen. Lastly, TNBC patients with BRCA1 mutation may be spared more aggressive NAT given an excellent response rate with both regimens. Although patients achieve exceptional response rates with KEYNOTE-522 NAT, it has not led to correspondingly higher rates of BCT.

1684041 - Time for a PRECEDENT - Surgical Outcome Reporting in Neoadjuvant Systemic Anticancer Therapy Breast Cancer Studies Is Inadequate, Inconsistent, and Needs to be Improved

Michael Jiang[1], Stuart McIntosh[2], Shelley Potter[1], On Behalf of The PRECEDENT Steering Group[3]

[1]Bristol Medical School, Bristol, England, United Kingdom, [2]Patrick G Johnston Centre for Cancer Research, Queen's University Belfast, Belfast, Northern Ireland, United Kingdom, [3]PRECEDENT Steering Group, England, United Kingdom

Background/Objective: Neoadjuvant systemic anticancer therapy (neoSACT) is increasingly used in early breast cancer. Response to treatment is highly prognostic for individual patients, may allow tailoring of subsequent adjuvant therapies and offers the ability to perform response-adjusted surgery, thus optimising oncological outcomes, reducing morbidity and improving patients' quality of life. However, robust information about locoregional treatment following neoSACT is vital to meaningfully interpret long-term oncological outcomes (such as locoregional recurrence) in neoSACT clinical trials. Furthermore, such information is required to ensure the benefits of neoSACT, particularly reductions in the extent of breast and axillary surgery, can be translated into practice. Issues relating to the quality of locoregional treatment reporting in neoSACT studies have recently been highlighted. This systematic review aimed to explore the current quality of outcome reporting as the first stage of the international PRECEDENT project.

Methods: A systematic search of PubMed identified primary research studies published in English between 01/01/2018-08/09/2023 reporting outcomes in patients receiving neoSACT of any modality for breast cancer with curative intent followed by locoregional treatment. Included were randomised controlled trials (RCTs) and non-randomised studies (NRS) with >250 participants reporting at least one outcome related to locoregional treatment. 'Surgical outcomes' were defined as details of surgery performed, surgical complications and factors related to surgical decision-making hypothesised to impact long-term oncological outcome. Outcomes were extracted verbatim and categorised using content analysis. Descriptive statistics were used to summarise results.

Results: Of 3,111 abstracts screened, 144 papers describing 138 studies (22 RCTs and 116 NRS) which reported at least one surgical outcome in 575,639 patients receiving neoSACT were included. A total of 516 outcomes relating to surgery or surgical decision-making were extracted. The median number of surgical outcomes per study was 3 (range 1-12). No single outcome was reported in all 138 studies. Most commonly reported outcomes included the type of breast (n=130, 94.2%) and axillary (n=87, 63.0%) surgery performed. Only a third of studies (n=47, 34.1%) reported how response to neoSACT was assessed following treatment, with fewer studies reporting how this informed surgical decision-making. Only 28 (20.3%) studies reported at least one outcome related to surgical de-escalation of either breast (n=21) and/or axillary (n=9) surgery - such as the number of patients downstaged from mastectomy to breast conserving surgery (BCS) or from axillary node clearance to sentinel lymph node biopsy following neoSACT. Furthermore, reporting of surgical downstaging was extremely heterogenous with 59 different de-escalation related outcomes reported across the 28 studies. The term 'BCS eligibility' was frequently used, but few studies defined how this was assessed. Surgical outcomes such as complication rates were only reported in a minority of studies (n=9, 6.5%).

Conclusions: Current reporting of surgery, surgical outcomes and factors impacting surgical decision-making in neoSACT studies is poor, inconsistent and urgently needs to be improved. The BIG-NCTN PRECEDENT project aims to develop a core outcome set and reporting guidelines for locoregional treatments in neoSACT studies. It will ensure consistent, standardised reporting of key locoregional outcomes, supporting clinicians and patients to make informed decisions about treatment options.

1687624 - Real-world Oncology Experience of Neoadjuvant Pembrolizumab for Triple-negative Breast Cancer: Surgery Outcomes and Pathological Responses

Sara Cartwright[1], Heng Jiang[2], Shivani Modi[3], Samia Asif[1], Meghana Kesireddy[1], Amulya Yellala[1], Daphne Ly[1], Andrew Wahl[1], Jessica Maxwell[1], Jairam Krishnamurthy[1], Juan Santamaria-Barria[4]

[1]University of Nebraska Medical Center, Omaha, NE, [2]Women and Children's Hospital of Hubei Province, Wuhan, Hubei, China (People's Republic), [3]Einstein Healthcare Network, Jefferson Health, Philadelphia, PA, [4]University of Nebraska Medical Center, Elkhorn, NE

Background/Objective: The KEYNOTE-522 phase III randomized trial demonstrated that adding pembrolizumab to neoadjuvant chemotherapy improved triple-negative breast cancer (TNBC) pathological complete response (pCR) rates (64.8% vs 51.2%) and outcomes (36-month event-free survival 84.5% vs 76.8%; HR: 0.63). Real-world experience data on the KEYNOTE-522 regimen are lacking.

Methods: After regulatory FDA approval in July 2021, we prospectively analyzed our first consecutive patients treated with the KEYNOTE-522 neoadjuvant regimen (carboplatin, paclitaxel, doxorubicin, cyclophosphamide, and pembrolizumab). Data analyzed included demographics, clinical history, staging, pathology, adverse events (AEs), surgical pathology, and outcomes. The primary focus was pCR rate with the secondary analysis being clinical and surgical variables.

Results: From 08/2021 to 04/2023, 31 consecutive women received the KEYNOTE-522 neoadjuvant regimen for TNBC (last surgery 09/2023). Demographic, clinical, and pathological data are shown in Table 1. The average age was 53 years old and average BMI 30.3 kg/m2. There were 26 White non-Hispanic, 4 Black, and 1 Hispanic patients. Five (16%) patients had pathogenic germline mutations (BRCA1, BRCA2, CHEK2, PALB2, and MUTYH). Dose reductions and discontinuations occurred in 17 (55%) patients; immune-related AEs occurred in 6 (19%) patients, leading to pembrolizumab discontinuation in 4 (13%) patients (1 grade IV pneumonitis, 1 grade III pneumonitis, and 2 grade III colitis). Neutropenic fevers requiring hospitalization occurred in 15 (48%) patients and no treatment-related mortalities occurred. Overall, responses were poorer than anticipated: 15 (48.4%) patients achieved pCR, and the residual cancer burden (RCB) class of the 16 non-pCR patients were 5 with RCB-1, 6 with RCB-2, and 5 with RCB-3. Dose reductions and treatment discontinuations were similar between pCR and non-pCR (p=0.38). Among pCR patients (n=15), all were ycT0 ycN0 on post-treatment physical exam, but 7 were ycT1-2 and 1 was ycN1 on post-treatment imaging. Five underwent mastectomy and 10 had breast conservation; 11 underwent sentinel lymph node biopsy, 3 sentinel and targeted axillary dissection with removal of the clipped node, and 1 axillary lymph node dissection (ALND; cN3 on presentation). There were no surgery or post-operative complications and 12 patients completed adjuvant radiation (10 whole breast, 2 chest wall/regional nodes). Among non-pCR patients (n=16), 8 were ycT1-4 on post-treatment physical exam, and 9 were ycT1-4 and 3 ycN1 on post-treatment imaging. Six underwent mastectomy and 10 had breast conservation; 5 underwent ALND (3 IBC and 2 residual nodal disease), of which 3 developed arm lymphedema. In this group, there were 2 patients with surgical site infections and 12 patients completed adjuvant radiation (9 whole breast, 4 chest wall/regional nodes). Among non-pCR patients, 3 had cT4d triple-negative IBC and 3 had metaplastic TNBC; when excluding these, the pCR rate improved (15/25, 60%). No pCR patients exhibited recurrences, but two non-pCR IBC patients recurred distantly, resulting in one mortality.

Conclusions: Our initial real-world experience with the KEYNOTE-522 neoadjuvant regimen revealed poor tolerability, frequent dose reductions/discontinuations, notable immune AEs, overall safe surgical outcomes, and lower than expected pCR rate. This approach yielded unfavorable results for cT4d IBC or metaplastic TNBC, highlighting the unmet oncological need in these breast cancer subtypes.

Table 1: Demographic, pathological, and clinical characteristics of 31 women treated with KN-522

	Total (n=31)	pCR (n=15, 48.4%)	Non-pCR (n=16, 51.6%)	P value
Age at diagnosis (mean)	53	50	55	0.26
Race/Ethnicity				
White non-Hispanic	26	12	14	0.57
African American	4	2	2	
Hispanic	1	1	0	
Body mass index (kg/m^2)	30.3	29	32	0.29
Performance status				
0	27	14	13	0.60
1	4	1	3	
Pathogenic germline mutation				
BRCA1	1	1		
BRCA2	1		1	
PALB2	1	1		
CHEK2	1		1	
MUTYH	1	1		
AJCC 8th edition TNM (anatomic stage)				
T1	2	2	0	0.11
T2	16	8	8	
T3	9	5	4	
T4	4	0	4	
N0	19	9	10	0.89
N+	12	6	6	
AJCC 8th edition (prognostic stage)				
IIA	4	2	2	0.99
IIB	12	6	6	
IIIB	9	4	5	
IIIC	6	3	3	
Pathology characteristics				
Metaplastic carcinoma	3	0	3	
Nottingham grade 2	5	3	2	
Nottingham grade 3	26	12	14	
HER2-low (%)	12	5 (33%)	7 (44%)	
Ki-67 % (median)		67	75	0.84
LVSI	5	2	3	
Dose reductions/discontinuations				
Yes (%)	17 (56%)	7 (47%)	10 (63%)	0.38
No (%)	14 (44%)	8 (53%)	6 (37%)	
Pembrolizumab discontinuation	4	2	2	
Clinical response on physical exam				
ycT0	23	15	8	0.002
ycT1-4	8	0	8	
ycN0	31	15	16	
ycN1	0	0	0	
Clinical response on imaging				
ycT0	15	8	7	0.60
ycT1-4	16	7	9	
ycN0	27	14	13	
ycN1	4	1	3	
Median interval from last chemotherapy to surgery (days)	29	29	29	
Surgery performed				
Breast conservation	20	10	10	
Mastectomy	11	5	6	
SLNB	21	11	10	
TAD/SLNB	4	3	1	
ALND	6	1	5	
Residual cancer burden (RCB) class				
RCB-1	5	0	5	
RCB-2	6	0	6	
RCB-3	5	0	5	
Adjuvant radiation				
Whole breast	19	10	9	
Chest wall/RNI	6	2	4	
Post-treatment outcomes				
Arm lymphedema	3	0	3	
Surgical site infection	2	0	2	
Recurrence (distant)	2	0	2	
Death	1	0	1	

pCR: pathological complete response; HER2-low: IHC 1+ or 2+ with non-amplified FISH; LVSI: lymph-vascular invasion; ycTxNx: clinical response staging after systemic therapy; SLNB: sentinel lymph node biopsy; TAD: targeted axillary dissection; ALND: axillary lymph node dissection; RNI: regional nodal irradiation

1688353 - Detailed Smoking History and Association with Nipple Necrosis Following Nipple-sparing Mastectomy

Korene Gbozah[1], Blair Wormer[2], Lilian Thomas-Harris[2], Judy Tjoe[3], Kristina Shaffer[4]

[1]University of North Carolina School of Medicine, Chapel Hill, NC, [2]Novant Health, Charlotte, NC, [3]Novant Health, Greensboro, NC, [4]Novant Health Cancer Institute, Charlotte, NC

Background/Objective: Nipple necrosis is a major complication following nipple-sparing mastectomy (NSM). Smoking is a known risk factor for this complication, but the relationship between extent of smoking history and peri-operative timeframe of smoking cessation on the incidence of nipple necrosis is not well characterized. This study aimed to assess the association between extent of smoking history and timing of smoking cessation on the risk of nipple necrosis following NSM.

Methods: A retrospective chart review was performed on consecutive patients undergoing NSM for a breast cancer diagnosis at multiple facilities throughout our hospital system between 1998 and 2021. Patients were categorized into groups based on their smoking history: never smokers, former smokers, and current smokers. Time from quitting smoking to surgery and extent of smoking history, such as packs-per-day (PPD) and pack-years (PY), were also reviewed. Nipple necrosis was defined as complete or partial loss of the nipple areolar complex requiring treatment. Associated patient and surgical factors were also examined, and outcomes information collected. A descriptive analysis was performed, and the incidence of nipple necrosis was evaluated.

Results: Of 619 total patients who underwent NSM, 608 with complete data regarding nipple necrosis were included, accounting for 1066 NSMs. The average age was 48.1 years (range: 24.0-80.0) and the average BMI was 22.1 (range: 16.4-44.2). There were 29 patients who experienced nipple necrosis for a total of 36 NSMs (3.4%). Most patients underwent immediate prosthetic reconstruction, while 2 had immediate autologous reconstruction, and 3 did not undergo immediate reconstruction. Most patients were never smokers, 449 (73.8%), compared to 140 (23.0%) who were former smokers, and 18 (3.0%) who were current smokers. Twenty-one (4.7%) never smokers experienced nipple necrosis, while 8 (5.7%) former smokers, and 0 current smokers experienced this. Of former smokers specifically, those who quit < 1 month prior to surgery had the highest rate of nipple necrosis, 33.3% (p=0.003). There was no significant difference in rates of nipple necrosis for PPD or PY history. Larger native breast size >600 mL compared to < 600 mL was associated with an increased risk for nipple necrosis (6.6% vs 2.4%; p=0.002), as was implant/tissue expander volume >300 mL compared to < 300 mL (5.6% vs 2.9%; p= 0.04), and radial incisions compared to inframammary (5.4% vs 2.3%; p=0.01).

Conclusions: This study suggests that patients undergoing NSM with a smoking history, regardless of duration or intensity, may not be at significantly increased risk for nipple necrosis. However, the observed incidence of nipple necrosis was highest in patients who quit within the month leading up to surgery. This is likely in part due to appropriate selection of patients for NSM and indicates consideration for smoking cessation at least one month prior to surgery.

1672486 - Early Post-operative Complication Rates in Women with Large Breasts (600+ grams) Undergoing Extreme Skin-sparing and Extreme Nipple-sparing Mastectomy with Immediate Reconstruction

Adam Johnson[1], Andrea Moreira[2], Vaishali Purohit[1], Tara Lamb[3], Jasmine Dywer[1], Jenna Li[4], Emil Fernando[5], Janette Gomez[1], Jennifer Saldanha[1], Thomas Jullian[5], Suzanne Coopey[5]

[1]Allegheny Health Network, Pittsburgh, PA, [2]University of Pittsburgh Medical Centers; University of Pittsburgh Medical School, Pittsburgh, PA, [3]Drexel University College of Medicine, Philadelphia, PA, [4]Allegheny Health Network Research Institute, Pittsburgh, PA, [5]Allegheny Health Network; Drexel University College of Medicine, Pittsburgh, PA

Background/Objective: There is a paucity of data on complication rates of women with large-volume breasts (≥ 600g) undergoing Skin-Sparing Mastectomy (SSM) and Nipple-Sparing Mastectomy (NSM) with immediate reconstruction. The objective of our study was to compare complication rates in patients with large-volume breasts after SSM versus NSM.

Methods: After obtaining IRB approval, we identified patients within our health network who underwent extreme Skin-Sparing Mastectomy (eSSM) or extreme Nipple-Sparing Mastectomy (eNSM) (with immediate reconstruction from January 2020 through June 2022. We conducted a comprehensive analysis, comparing patient demographics, treatments, and incidence of complications between the two groups. Two-sided t tests were used for comparison of continuous variables, and chi-squared tests or Fisher's Exact tests were used to compare categorical variables.

Results: A total of 100 patients underwent eSSM and 43 patients underwent eNSM during this time frame. Patient undergoing eSSM were significantly older (mean age 51.76 vs 47.67 years, p=0.026), had larger mean breast weights (1015.57 vs 879.22 grams, p=0.0047), and had smaller implants placed (544.79 vs 608.93 cc, p=0.0038) compared to eNSM patients. There were no significant differences in mean BMI, diabetes, or hypertension. There were no significant differences in proportion of prophylactic cases, bilateral cases, reconstruction type, or adjuvant treatments received [Table]. Major complications occurred in 23.00% of eSSM patients compared to 27.91% of eNSM patients, and minor complications occurred in 32.00% of eSSM versus 13.95% of eNSM patients (p=0.067). eSSM patients experienced more skin flap necrosis (15.00% vs 6.98%) and wound infections (11.00% vs 4.65%). Total nipple necrosis occurred in 4.65% of eNSM patients.

Conclusions: In our study, we found no significant difference in complication rates between NSM and SSM in patients with large-volume breasts who underwent immediate reconstruction. Our findings suggest that NSM with immediate reconstruction in women with large-volume breasts is a safe option and equivalent to SSM.

Table 1: Patient characteristics, treatments, and complications of extreme (>600g) SSM vs extreme (>600g) NSM

Variable	Extreme (>600g) SSM (n=100)	Extreme (>600g) NSM (n=43)	p-value
Mean Age	51.76	47.67	0.026
Mean BMI	32.77	32.02	0.46
Mean Breast Weight	1015.57 grams	879.22 grams	0.0047
Mean Implant Size	544.79 cc	608.93 cc	0.0038
Diabetes	8 (8%)	3 (6.98%)	1
HTN	39 (39%)	14 (32.56%)	0.57
Prophylactic	7 (7%)	5 (11.63%)	0.35
Bilateral	59 (59%)	30 (69.77%)	0.22
Reconstruction Type			
Expander	24 (24%)	12 (27.90%)	0.598
Direct Implant	63 (63%)	23 (53.49%)	
DIEP flap	12 (12%)	8 (18.60%)	
Latissimus flap	1 (1%)	0 (0%)	
Chemotherapy	44 (44%)	18 (41.86%)	0.81
Endocrine Therapy	62 (62%)	20 (46.51%)	0.125
Radiation			
Yes, PMRT	22 (22%)	5 (11.63%)	0.31
Yes, Prior	5 (5%)	3 (6.98%)	
No	73 (73%)	35 (81.39%)	
Complications			
Minor	32 (32%)	6 (13.95%)	0.067
Major	23 (23%)	12 (27.91%)	
None	45 (45%)	25 (58.13%)	
Type of Complication			
Seroma	17 (17%)	7 (16.27%)	
Hematoma	8 (8%)	3 (6.98%)	
Skin flap necrosis	15 (15%)	3 (6.98%)	
Nipple necrosis	0 (0%)	2 (4.65%)	
Wound dehiscence	6 (6%)	2 (4.65%)	
Cellulitis	6 (6%)	3 (6.98%)	
Wound Infection	11 (11%)	2 (4.65%)	
Partial flap necrosis	1 (1%)	1 (2.33%)	
Total flap necrosis	0 (0%)	0 (0%)	
Implant extrusion	0 (0%)	3 (6.98%)	

1674185 - Predictors of Cosmetic Satisfaction and Psychosocial Well-being After Nipple-sparing Mastectomy

Kate Pawloski, Jonas Nelson, Varadan Sevilimedu, Tiana Le, Audree Tadros, Monica Morrow, Virgilio Sacchini, Tracy-Ann Moo

Memorial Sloan Kettering Cancer Center, New York, NY

Background/Objective: Nipple-sparing mastectomy (NSM) is increasingly performed for prophylactic and therapeutic indications. The extent to which surgical factors including incision placement, reconstruction technique and complications affect long term satisfaction after NSM is unclear. We evaluated associations between patient and treatment-related variables and patient-reported outcomes (PROs) including cosmetic satisfaction with breasts (SABTR) and psychosocial well-being (PSWB) following NSM.

Methods: We identified consecutive patients treated with NSM between 4/2018 and 7/2021 at a single institution. The BREAST-Q survey was routinely collected prior to surgery and longitudinally including at 1 and 2 years postoperatively. SABTR and PSWB scores were rated on scale of 1-100. In this patient-level analysis, we evaluated associations between demographic and treatment-related factors (predictors) and SABTR and PSWB at 1 and 2 years after NSM, respectively, with univariable and multivariable linear regression models.

Results: Of the 333 patients who underwent NSM, the median age was 43 (interquartile range [IQR] 37, 49) and the median (IQR) body mass index was 22.3 (20.6, 24.6). Bilateral surgery was performed in 72% of the cohort (n=240) and most patients (86%, n=280) had immediate reconstruction with tissue expanders (TEs). Additional cohort characteristics are shown in Table 1. Median (IQR) SATBR scores were 64 (52, 82) preoperatively, 56 (39, 71) at 1 year, and 64 (50, 73) at 2 years. Median (IQR) PSWB scores were 69 (61, 87) preoperatively, 56 (39, 71) at 1 year, and 66 (55, 85) at 2 years (response rates for both domains: 55% [n=182], 67% [n=224], and 45% [n=151], respectively). On multivariable analysis, receipt of adjuvant radiation (β, -32; 95% confidence interval [CI], -42, -21; $p< 0.001$) and immediate reconstruction with pre-pectoral or subpectoral TEs (referent: autologous; β, -21; 95% CI, -35, -7.1, $p=0.004$) were associated with decreased SABTR at 1 year postoperatively. At 2 years, history of cosmetic breast surgery was associated with decreased SABTR (β, -16; 95% CI, -27, -4.4; $p=0.007$). Multivariable analysis of PSWB at 1 year demonstrated that receipt of adjuvant radiation (β, -44, 95% CI, -57, -31; $p< 0.001$), and TE reconstruction (β, -35; -62, -8.6; $p=0.011$) were associated with decreased well-being, whereas higher preoperative PSWB was independently associated with higher PSWB (β, 0.52; 95% CI, 0.23, 0.81; $p< 0.001$). No statistically significant predictors of 2-year PSWB were identified. Postoperative complications including skin flap and nipple necrosis were not associated with either BREAST-Q domain at 1 or 2 years.

Conclusions: In patients undergoing NSM, receipt of adjuvant radiation and implant-based reconstruction were associated with lower scores in the SABTR and PSWB domains at 1-year postoperatively. At the 2-year timepoint, history of cosmetic breast surgery was the only variable associated with lower SABTR, suggesting potentially different cosmetic expectations in this population, though further research is warranted. These data suggest that most treatment-related factors including the development of complications do not appear to affect long-term satisfaction following NSM.

Table 1: Cohort characteristics

Characteristic	N = 333
Age, median (IQR*)	43 (37, 49)
Race, n (%)	
White	236 (78%)
Asian/Indian	38 (13%)
Black	17 (5.6%)
Other race	10 (3.0%)
Unknown	32
Ethnicity, n (%)	
Hispanic	20 (7.1%)
Non-Hispanic	263 (93%)
Unknown	50
BMI, median (IQR)	22.3 (20.6, 24.6)
Current smoker, n (%)	7 (2.1%)
Grade ptosis, n (%)	
0	40 (14%)
1	110 (39%)
2	117 (41%)
3	16 (5.7%)
Unknown	50
Indication, n (%)	
Prophylactic	80 (24%)
Therapeutic	253 (76%)
Adjuvant radiation, n (%)	39 (15%)
Unknown	80
Prior breast surgery, n (%)	89 (27%)
Prior cosmetic breast surgery, n (%)	31 (9.3%)
History of breast radiation, n (%)	11 (3.3%)
Laterality of NSM, n (%)	
Bilateral	240 (72%)
Unilateral	93 (28%)
Incision location, n (%)	
Inframammary	172 (56%)
Radial +/- periareolar extension	137 (44%)
Unknown	24
Expander placement, n (%)	
Prepectoral	138 (49%)
Subpectoral	144 (51%)
Expander fill volume (ml), median (IQR)	200 (150, 295)
Weight of specimen (g), median (IQR)	317 (223, 427)
Unknown	25
Reconstruction type, n (%)	
Autologous	30 (9.2%)
Direct implant	16 (4.9%)
TE placement	280 (86%)
Unknown	7
Postoperative complication, n (%)	94 (28%)
Skin flap or nipple necrosis, n (%)	
Bilateral	45 (14%)
Unilateral	45 (14%)
None	243 (73%)
Degree of necrosis (n=90), n (%)	
Full-thickness necrosis	18 (21%)
Partial-thickness necrosis	46 (54%)
Superficial necrosis	21 (25%)
Office wound debridement, n (%)	7 (2.1%)
Return to OR for debridement, n (%)	8 (2.4%)
Nipple loss, n (%)	
Bilateral	6 (1.8%)
Unilateral	4 (1.2%)
None	323 (97%)
Implant Loss, n (%)	
Bilateral	5 (1.5%)
Unilateral	2 (0.6%)
None	326 (98%)

1688418 - Nipple-areolar Complex Cancer After Nipple-sparing Mastectomy

Mary Mrdutt, Tanya Hoskin, Tina Hieken

Mayo Clinic Rochester, Rochester, MN

Background/Objective: Preservation of the nipple-areolar complex (NAC) following nipple sparing mastectomy (NSM) retains epithelial cells with the potential for malignant transformation and may result in subsequent cancer development in the conserved NAC. With the number of risk-reducing and therapeutic NSMs increasing significantly over time, the population at risk for cancer of the NAC itself is increasing, but the frequency and outcomes of such an event remain undefined. Here we report on NAC malignancies arising after NSM.

Methods: With IRB approval, patients operated on for a post-NSM NAC malignancy were identified from a prospectively maintained institutional database; patient demographics, tumor characteristics, treatment patterns and outcomes were assessed. To estimate the risk of post-NSM NAC malignancy, all patients with NSM at our institution (01/2009 to 12/2018) were assessed for events during follow-up. The incidence of NAC malignancy as the first event after NSM was estimated accounting for competing risks of other oncologic events (non-NAC local recurrence, regional recurrence, distant recurrence). Patients with NAC excision for reasons such as ischemia, symmetry, or index surgery final pathology were censored at the date of NAC excision; all other patients were censored at the date of last clinical follow-up or death not related to cancer. The cumulative incidence estimate with 95% confidence interval was reported; comparisons were performed using Cox regression models with the robust sandwich estimator to account for the within-patient correlation for patients with bilateral NSM.

Results: We identified 17 patients presenting with a post-NSM NAC malignancy 2013-2023. Index NSM was performed for cancer in 16 and risk reduction in 1. Among the patients with NSM for cancer, the time from NSM to NAC malignancy was a median 45 months (range: 11-143 months). These NAC malignancies were Paget's disease in 8 (one with underlying ER/PR/HER2- invasive cancer), DCIS in 5 (3 ER+, 1 ER-, 1 unknown), and ER+/PR+/HER2- invasive cancer in 4 (3 ductal, 1 lobular). The patient with a post-risk-reducing NSM NAC malignancy, a BRCA2 pathogenic variant carrier, presented 58 months post-NSM, with T1N1 ER+/HER2- IDC in the NAC. With a median 24 months follow up, no subsequent oncologic events were observed in the 17 patients with post-NSM NAC malignancy. We then examined the cohort of 1481 NSMs performed at our institution (608 for cancer, 873 for risk reduction) in 888 unique patients 2009-2018 permitting minimum 5-years follow-up to estimate the risk of a post-NAC NSM malignancy. With 80 months median follow-up, the cumulative incidence of NAC-malignancy after NSM was 0.4% (95% CI: 0.2-0.9%) overall at 5 years but differed by indication for index NSM (0.8% after therapeutic NSM for cancer and 0.2% after risk-reducing NSM, $p< 0.01$). The competing risk of non-NAC cancer recurrence (local, regional, or distant) was 5.3% at 5 years in patients undergoing NSM for cancer.

Conclusions: Here we show that the risk of NAC malignancy following therapeutic or risk-reducing NSM is both low and treatable. These data help address a clinical knowledge gap that may be useful in counseling patients contemplating NSM and to design appropriate follow-up recommendations.

1688894 - Patient-reported Sensation and Satisfaction After Sensation-preserving Mastectomy

Anne Peled[1], Ziv Peled[2]

[1]Sutter Health California Pacific Medical Center, San Francisco, CA, [2]Peled Plastic Surgery, San Francisco, CA

Background/Objective: Preserving sensation and avoiding chronic pain due to intercostal nerve injury are the next frontiers in the ongoing evolution of mastectomy techniques. More recent advances to optimize sensory outcomes include a dual approach of carefully preserving intercostal nerves that can be safely saved from an oncologic standpoint and reconstructing those that can't with nerve allograft or autograft. Previously published results from this technique have demonstrated excellent sensory return on quantitative analysis. This current study describes patient-reported outcomes on sensation and satisfaction.

Methods: Patients underwent either therapeutic or prophylactic nipple-sparing mastectomy with the described approach in conjunction with immediate implant-based breast reconstruction. Modified BREAST-Q surveys focusing on sensation and nipple outcomes were administered to all patients pre-operatively and then again at 6 months, 1 year and 18 months. Scores from the latest post-operative time point were included in the analysis for patients who completed more than one survey.

Results: 151 patients were included in the analysis. Mean follow-up at the time of survey completion was 10 months (range 6 to 18 months). 60% of patients reported "a lot" or "some" nipple sensation and 83% reported "a lot" or "some" overall breast sensation. 2/3 of patients reported their nipples were responsive to touch. 75% of patients described satisfaction with the role that their breasts played in intimacy and sex. Over 90% of patients reported being satisfied with their breast appearance.

Conclusions: Immediate preservation and restoration of sensation at the time of nipple-sparing mastectomy is associated with high rates of patient-reported breast and nipple sensation. Patient-reported outcomes related to sexuality and intimacy are also very favorable and improved from historical data on traditional mastectomies. More widespread implementation of these sensation-preserving mastectomy techniques into breast surgical practices will allow for further refinement in technique and patient selection and better understanding of outcomes in more diverse patient populations.

1682158 – Nipple-sparing Mastectomy vs. Skin-sparing Mastectomy: No Difference in 10-year Outcomes

Kyle Anderman[1], Abigail Daly[1], Bridget Kelly[1], Michelle Specht[1], Francys Verdial[1], Tawakalitu Oseni[1], Tolga Ozmen[1], Rebecca Kwait[2], Michele Gadd[1], Barbara Smith[1]

[1]Massachusetts General Hospital, Boston, MA, [2]Massachusetts General Hospital, Danvers, MA

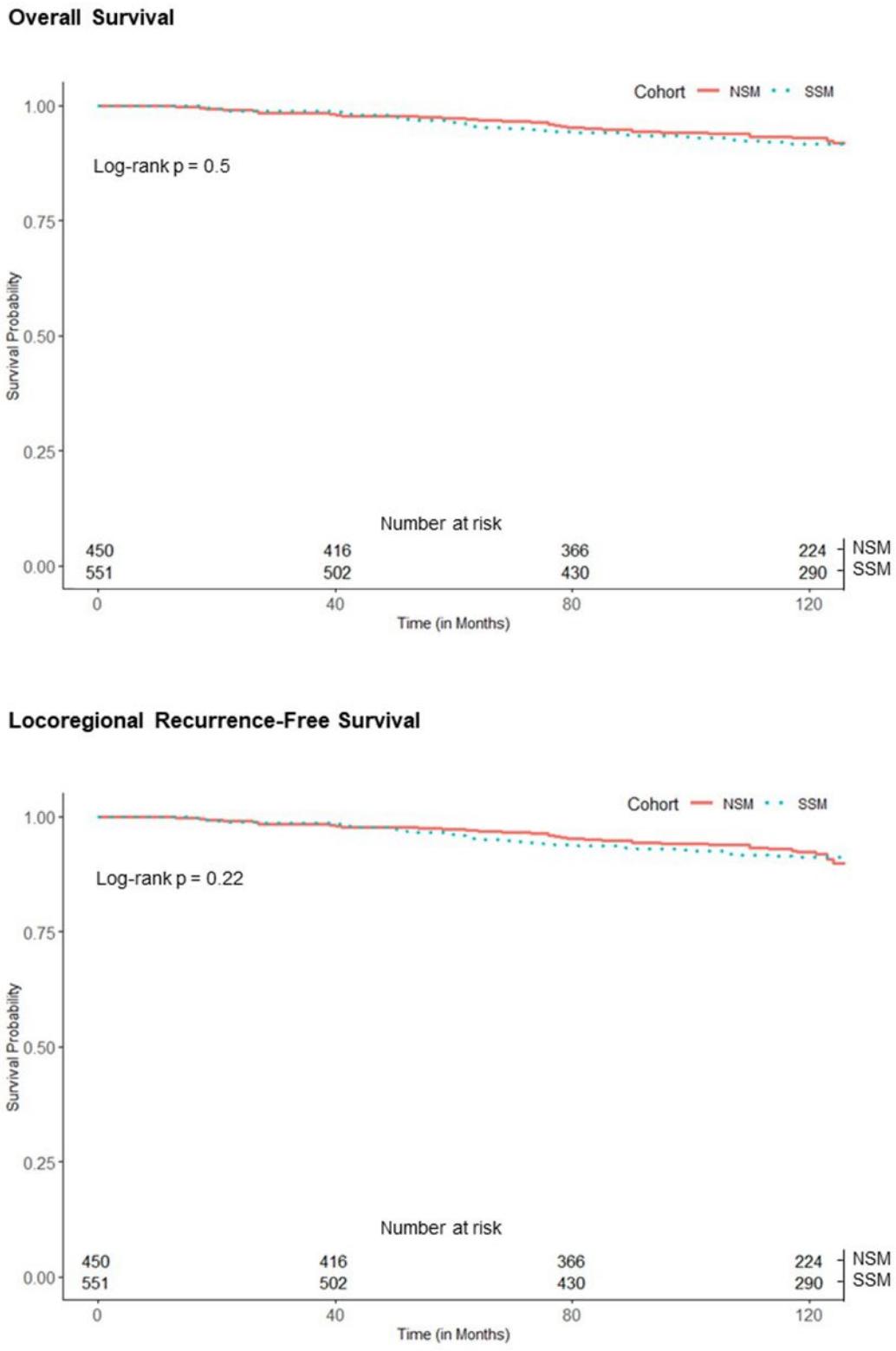
Background/Objective: There is little data directly comparing nipple sparing mastectomy (NSM) and skin sparing mastectomy (SSM) outcomes in breast cancer patients, and a randomized trial is not feasible. We reviewed 10-year outcomes in large cohorts of contemporaneous NSM and SSM treated and followed at a single institution. Uptake of NSM at this time varied by surgeon, with selection of NSM vs. SSM often determined by the surgeon to whom the patient was assigned, rather than by patient or tumor characteristics, roughly approximating randomization.

Methods: We performed an IRB-approved review of all NSM and SSM with immediate reconstruction performed for stage 0-III breast cancer from 1/2010 through 12/2013, excluding those with < 1 year of follow-up. Patients were ineligible for NSM only for direct nipple involvement on exam or imaging, or if breast size predicted an unacceptable nipple location. Patient and tumor characteristics, treatments, and outcomes were collected from the electronic medical record.

Results: We identified 499 NSM (median follow-up 119 months) and 608 SSM (median follow-up 121 months). The mean age of NSM patients was 48 years (range 23-72 years), with 31% postmenopausal. SSM patients were slightly older ($p< 0.001$), with a mean age 51 years (range 20-80 years), with 46% postmenopausal. SSM patients had higher average calculated breast volumes than NSM patients (874 cm3 vs. 506 cm3, respectively). There was no significant difference in the distribution of tumor histological types or hormone receptor status between NSM and SSM cohorts. 30% of NSM and 30% of SSM tumors were ductal carcinoma in situ (DCIS) ± microinvasion. Compared to NSM patients, SSM patients had larger tumors (SSM mean 2.42 cm (range 0.1-18.5 cm) vs. NSM mean 1.91 cm (range 0.05-9.5 cm), $p< 0.001$), higher rates of positive nodes (23.03% vs. 15.83%, $p=0.003$), and more postmastectomy radiation (32.12% vs. 22.04%, $p=0.008$). At 10-years median follow-up, there was no difference in locoregional recurrence-free survival (92.2% NSM, 91.1% SSM, $p=0.22$), disease-free survival (91.4% NSM, 90.6% SSM, $p=0.27$), or overall survival (92.8% NSM, 91.7% SSM, $p=0.5$) between NSM and SSM cohorts (Figure 1). Nipple recurrences were seen in 3 (0.67%) NSM patients. Locoregional-only recurrences outside the nipple were seen in 12 (2.7%) NSM patients and 10 (1.8%) SSM patients ($p = 0.36$). On multivariable analysis including patient and tumor characteristics, treatments, and mastectomy type, the use of NSM vs. SSM had no significant impact on the odds of locoregional recurrence, distant recurrence, any recurrence, or breast cancer-related death.

Conclusions: At 10 years median follow-up there was no significant difference in locoregional recurrence, distant recurrence, breast cancer-related death, or overall survival between patients undergoing NSM vs. SSM for breast cancer. These data support the routine use of NSM in women with breast cancer.

Figure 1. Kaplan-Meier survival curves: overall survival and locoregional recurrence-free survival



1688651 - Oncoplastic Breast Surgery Following Neoadjuvant Chemotherapy - A Systematic Review

Laith Alghazawi[1], Mohamed Attia[2], Daniel Leff[3], Michael Boland[4]

[1]Imperial College London, Ipswich, England, United Kingdom, [2]Imperial College Healthcare NHS Trust, London, England, United Kingdom, [3]Imperial College London, London, England, United Kingdom, [4]St Vincent's University Hospital, Dublin, Ireland

Background/Objective: Oncoplastic Breast Surgery (OBS) reduces the need for mastectomy whilst achieving satisfactory oncological and aesthetic outcomes for breast cancer patients. The role of OBS is well established but its use in patients who have undergone Neoadjuvant Chemotherapy (NACT) remains unclear. The aim was to systematically review the current available literature that describes OBS following NACT in comparison with patients not receiving NACT or those undergoing non-OBS breast surgical procedures.

Methods: The review was performed using PRISMA guidelines with studies identified from PubMed, MEDLINE and EMBASE databases. Studies including patients who received NACT that reported OBS outcomes alone or in comparison with other breast surgical procedures were included. Oncological outcome data included recurrence, re-operation, positive margin and mortality rates. Pathological outcome data included tumor size, specimen weight (g), resection margin width (mm) and finally aesthetic characteristics were also collected.

Results: Seventeen articles were included, involving 11,538 patients. The median (range) follow-up was 48 (30-118) months. The median (range) age of included patients was 52 (46–59) years old. The size of tumour had a median (range) of 29mm (14.2–43.7). Eight studies described OBS outcomes alone, with or without NACT. However, of those studies, only one article specifically reported outcomes for NACT and non-NACT patients. The remaining studies compared outcomes of OBS with either Breast Conservation Surgery (BCS) or Mastectomy, or both. Oncological outcomes were comparable between OBS and non-OBS procedures. 88.2% of studies reported rates of recurrence, re-operation and positive margins and found no difference in any of these outcome measures, however significant heterogeneity was observed between these studies, limiting direct comparison. Resection margin width (mm) was only described in 41.2% of the studies and 52.9% recorded the specimen weight. Similarities between the resection margin width and weight of specimen were observed when reported, but these outcomes were not specifically described for NACT and non-NACT patients. Six studies (35%) described aesthetic outcomes. Of these, 2/6 studies included patient reported aesthetic outcomes using BREAST-Q questionnaires. The first study showed significant advantages in physical well-being for OBS, compared to Mastectomy, while the other showed no significant results between OBS and BCS. The remaining four studies used non-validated scoring tools for aesthetic outcomes but did demonstrate improved aesthetic outcomes for OBS when compared with non-oncoplastic BCS. Studies reporting aesthetic outcomes did demonstrate high levels of heterogeneity.

Conclusions: OBS after NACT appears oncologically safe and is associated with improved aesthetic outcomes in patients that may otherwise have required a mastectomy. Similarities of outcomes were observed between the outcomes of OBS with NACT, but heterogeneity limited direct comparison. Larger longer-term prospective studies are required to fully elucidate the benefit of OBS after NACT.

1688758 - Comparing the Cost: Does Extreme Oncoplastic Breast-conserving Surgery Confer a Cost Benefit When Compared to Mastectomy and Reconstruction?

Janelle-Cheri Millen, Katherine Jackson, Stacey Stern, Crystal Fancher, Janie Grumley

Saint John's Cancer Institute, Santa Monica, CA

Background/Objective: Extreme oncoplastic breast conserving surgery (eOBCS) describes the application of oncoplastic breast conserving surgical techniques to patients who would otherwise need a mastectomy. The safety of this surgical approach has been previously described. This study aimed to compare the costs of eOBCS to mastectomy, its traditional alternative.

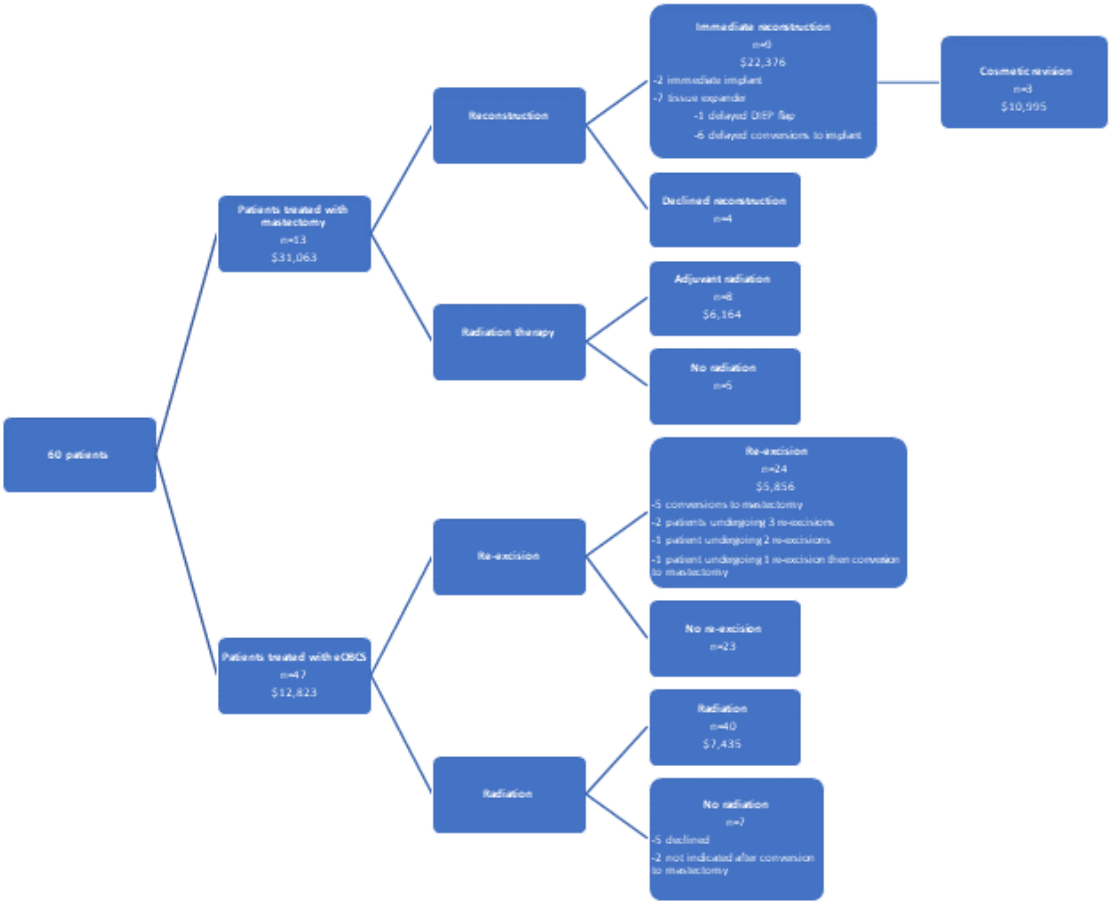
Methods: We reviewed our institutional prospectively maintained database identifying all breast cancer patients treated surgically since our introduction of oncoplastic surgery in 2018 who met inclusion criteria of large tumors (>5cm),

multifocal or multicentric disease at their preoperative assessment. Patients were grouped according to their surgical approach. The direct costs of their care inclusive of index surgical intervention, surgical re-excisions, immediate and delayed reconstructions and adjuvant radiation therapy were determined and compared. Indirect costs were not included.

Results: Between 2018 and 2023, 60 breast cancer patients meeting the inclusion criteria underwent curative intent surgical intervention at our institution. Of these patients, 13 (22%) were treated with mastectomy while 47 (78%) were treated with eOBCS. Of the patients who underwent mastectomy, 9 (70%) underwent subsequent reconstruction and 8 (62%) underwent adjuvant radiation therapy. The mean cost of the mastectomy index operation when immediate reconstruction was performed was $22,376. Of the patients undergoing reconstruction, 5 (55%) required a staged-second procedure at a mean cost of $13,398. Eight mastectomy patients (62%) received adjuvant radiation treatment at a mean cost of $6,164. Three mastectomy patients (23%) additional cosmetic revisions at a mean cost of $10,995. Of the patients who underwent eOBCS, 24 (51%) underwent subsequent re-excisions including 5 (11%) who underwent subsequent mastectomy. Forty (85%) of the eOBCS patients underwent adjuvant external beam radiation therapy (EBRT). Twenty-four eOBCS patients (51%) required 29 re-excisions at a mean cost of $5,856, and 40 eOBCS patients (85 %) received adjuvant radiation treatment at a mean cost of $7,435. The overall cost of care for eOBCS patients remained lower than the cost of care for those who underwent mastectomy ($12,823 vs. $31,063, $p<.01$).

Conclusions: eOBCS is a cost-effective alternative to mastectomy in patients with large, multifocal tumors, with a low conversion rate to mastectomy. Despite some patients needing re-excisions and mastectomy, eOBCS is associated with less financial toxicity.

Figure 1: Flow sheet of patient treatment and cost



1688605 - Which Outcomes Are Important to Patients After Therapeutic Mammoplasty?

Alice Lee[1], Daniel Leff[2]

[1]Mid and South Essex Trust, Hornchurch, England, United Kingdom, [2]Imperial College London, London, England, United Kingdom

Background/Objective: Therapeutic mammaplasty (TM) is an oncological procedure which combines tumour resection with breast reduction and mastopexy techniques. Symmetrising surgery is sometimes performed to 'balance' the appearance of the contralateral breast, either as an immediate or delayed procedure. In the literature, there are various ways of evaluating success of this procedure, e.g., oncological clearance, cosmetic outcomes (examples of 'outcomes'). At present, nobody knows which outcomes matter most to patients or healthcare professionals. This makes it difficult to assess patient satisfaction after surgery. The aim of this study is to understand which outcomes matter most to patients after therapeutic mammoplasty, and to explore the differences (if any) between delayed and immediate symmetrisation surgery.

Methods: Twelve patients were recruited and interviewed from the authors' institution: 7 in one-to-one interviews and 5 in two group interview sessions. Four women underwent symmetrising surgery: 2 immediately and 2 as delayed procedures. The discussion was guided by researcher using a topic guide co-developed with an expert breast cancer patient. The interviews were audio-recorded, transcribed, and thematically analysed to identify important themes. Full ethical approval was granted.

Results: Several key themes were deduced. Regarding surgical decision making, most women identified oncological clearance as their priority but they also appreciated having a good cosmetic outcome (for most this came retrospectively). Important external factors which guided surgical decision making included the opinions of the surgical team and relatives. All women who had symmetrizing surgery expressed a preference for this to be done immediately, to reduce the number of general anaesthetics, shorten the patients' reconstructive journey, and to avoid feeling unbalanced in bras whilst awaiting surgery. Regarding breast appearance, participants wished to avoid significant deformity, particularly if they had relatives with negative experiences. Patients also highlighted a preference for minimal scarring, satisfactory symmetry, and size, and feeling comfortable in clothes, swimwear and in front of partners and family. All women felt that patients should assess aesthetic outcome first and foremost but appreciated feedback from the surgical team; satisfaction with cosmesis was deemed a personal judgement and the concept of objective measurements was disliked. The effect of surgery on quality-of-life was variable. Some patients described ongoing issues which negatively impacted their daily life with respect to pain, difficulty sleeping, returning to work and worry regarding recurrence and complications. Some found intimacy with partners challenging due to concerns with breast appearance and pain. However, in other instances quality-of-life was improved after surgery. For example, some women who had both breasts reduced in size described functional benefits (e.g., ease of exercising).

Conclusions: All women highlighted oncological clearance as their main priority. Concern for cosmesis was often retrospective; all women were satisfied with their breast appearance and decision to have TM. Immediate symmetrisation was preferred over delayed symmetrisation for the reasons above.

1688283 - Development and Validation of a Level II Oncoplastic Simulator

Laith Alghazawi[1], Stella Mavroveli[2], Eleni Anastasiou[2], Mohamed Attia[3], Natalie Johnson[3], Daniel Campioni-Norman[2], Dimitri Amiras[2], Andreas Ladas[3], Michael Boland[4], Paul Thiruchelvam[5], Daniel Leff[6]

[1]Imperial College London, Ipswich, England, United Kingdom, [2]Imperial College London, London, England, United Kingdom, [3]Imperial College Healthcare NHS Trust, London, England, United Kingdom, [4]St Vincent's University Hospital, Dublin, Ireland, [5]Imperial College Healthcare NHS Trust, London, England, United Kingdom, [6]Imperial College London, London, England, United Kingdom

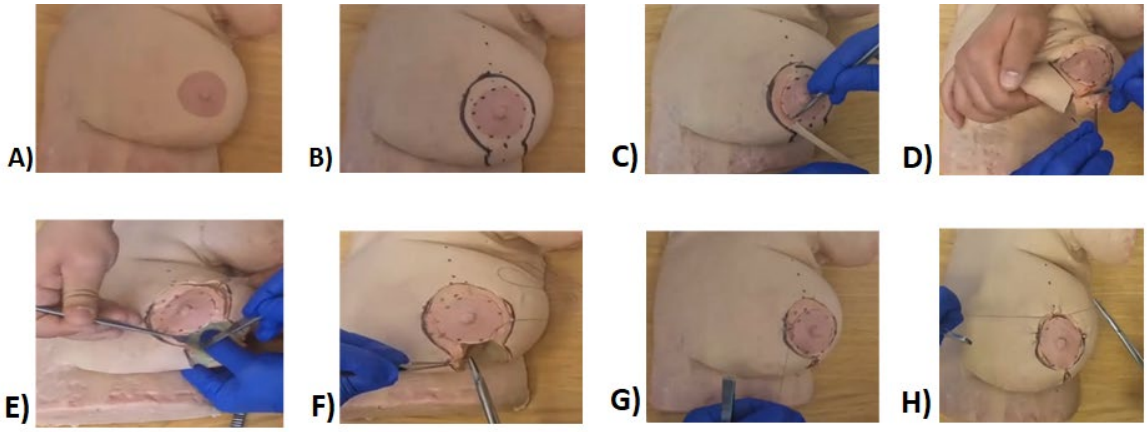
Background/Objective: As oncoplastic techniques are increasingly practiced by breast surgeons in the USA, systems for safe training are increasingly critical. Simulation enables safe procurement of skills for residents. Synthetic silicone-based simulations are considerably more cost-effective than cadavers. However, whilst simulations of oncologic breast surgery are limited, there have been no attempts to develop a validated oncoplastic simulator. We aimed to design and validate an oncoplastic simulator using a validated video-based competency assessment tool (CAT) and end-product assessments. Here, we present the results of face, content and construct validation.

Methods: A silicone based oncoplastic simulation was developed through multiple rounds of anatomical review, discussions with experts in the field, and casting / re-casting of a patient with ptotic breasts. IRB ethical approval was obtained prior to data collection (ICREC: 22IC7875). A modified Delphi protocol was utilised to create a validated CAT with expert oncoplastic breast surgeons. The final tool described performance across two domains of performance quality (i.e., execution and end-product assessment) and across five procedural subphases (i.e. mark-up, de-epithelialisation, tumor resection, nipple pedicle selection, and closure). For each subphase, descriptors reflecting performance (1-4 scale) helped guide assessment. Surgeons of varying operative experience performed a vertical scar therapeutic mammoplasty on the simulator. Procedures were videotaped (blinded, pseudo-anonymised), reviewed and independently rated against the CAT by three consultant oncoplastic surgeons. Specimen weights(g) were recorded. Computed Tomography of each specimen enabled volumetric analysis to determine estimated resection volume, resection volume to breast volume ratio, and the percentage of incomplete resection based on an "optimal" 10mm macroscopic margin. Face and content validity questionnaires were also administered.

Results: 30 surgeons were recruited (10 attendings, 10 senior residents and 10 junior residents). Attendings scored higher marks on the CAT (mean±StD=33.6±4.7/40), compared to senior (mean±StD=31.1 ± 4.0/40) and junior residents (mean±StD=26.9±5.0/40). Statistically significant differences were observed in video-based ratings of performance between operators ($p< 0.05$). Post hoc analysis demonstrated significant differences between attendings and junior residents, and similarly between senior and junior residents across all procedural subphases ($p< 0.05$). Attendings and senior residents were best discriminated on both the resection ($p=0.015$) and nipple pedicle development phases ($p=0.023$). Inter-rater reliability was excellent ($\alpha \geq 0.95$) with fair to moderate inter-rater agreement ($\kappa=0.215–0.552$). Compared to residents, attendings were significantly faster ($p< 0.05$) and resected specimens were of the greatest volume and weight ($p< 0.05$). Attendings demonstrated the least percentage missing tissue around optimal margins ($p< 0.05$) and the lowest proportion of macroscopically visible tumour at the margin of resected tissue ($X2=0.002$). The simulator was found to accurately reflect real life (84% scored ≥4/5), was useful (63.3%=5/5) with high transfer to real functionality (53.35%=5/5). Resident confidence increased after practicing on the simulator (pre:37%=5/5 confidence, post:60%=5/5 confidence).

Conclusions: An innovative oncoplastic level II breast simulator demonstrates excellent face and content validity. CAT video-based ratings and end product differentiates operator grade and is demonstrably construct valid. This tool can be used for training and objective assessment of residents to widely disseminate skills in oncoplastic surgery.

Figure 1: Simulation photographic illustration



Photographic illustrations of a vertical scar Therapeutic Mammoplasty procedure performed by an expert Oncoplastic Breast surgeon, obtained from video dataset. Each image represents the key steps and are subcategorized as: **A.** breast model simulator; **B.** skin markings; **C.** de-epithelialisation; **D.** Skin incision; **E.** Tumour resection; **F.** pedicle reconstruction; **G.** nipple relocation and **H.** closure.

1684582 - Minimizing Complications and Optimizing Adjuvant Therapy Timeliness After Oncoplastic Level II Surgery: A Crucial Imperative

Ashley DiPasquale[1], Megan Delisle[2], Krishna Clough[3], Guila Borgonovo[3], Isabelle Sarfati[3], Jenny Millochau[3], Claude Nos[3]

[1]Arizona Center for Cancer Care, Phoenix, AZ, [2]University of Manitoba, Winnipeg, MB, Canada, [3]The Paris Breast Center, Paris, Ile-de-France, France

Background/Objective: Oncoplastic surgery (OPS) techniques have revolutionized BCS, as previously patients with large resection volumes often required mastectomy. OPS allows patients to retain their natural breast shape, function, and sensation giving patients high satisfaction with breasts appearance and improved psychosocial wellbeing compared to those undergoing mastectomy. However, with these advantages, OPS Level II mammoplasties also bring an increased risk of complications, particularly fat necrosis. These complications may result in delays in receiving adjuvant therapy. This study aims to assess complication rates and adjuvant treatment delays in patients undergoing OPS Level II breast conserving surgery at a high-volume center with specialized surgeons trained extensively in advanced oncoplastic techniques.

Methods: This study included patients who underwent OPS level II mammoplasty at the Paris Breast Centre between 2004 and 2022. Patient, tumor, and treatment characteristics were collected using a prospectively collected database.

Results: Among the 374 patients, 46 (11%) experienced complications on the ipsilateral breast, with fat necrosis being the most common (44%). Fat necrosis often led to delayed wound healing and infection in affected patients. Immediate contralateral symmetrisation procedures were performed in 106 (28.3%) patients. Only 5 (4.7%) of these patients experienced complications on the contralateral breast. Median days to adjuvant radiotherapy (RT) were 54 days in patients with no complications and 64 days in patients with complications (p-value 0.007). Median days to adjuvant chemotherapy were 35 days in patients with no complications and 35.5 days in patients with complications (p-value 0.61).

Conclusions: OPS Level II mammoplasties carry considerable advantages for patients. But proper patient selection criteria and a high level of surgical expertise are crucial to minimize the risk of complications, including fat necrosis, when performing OPS Level II mammoplasties.

1688259 - Extreme Oncoplastic Breast-conserving Therapy Versus Mastectomy for Locally Advanced Breast Cancer

Katherine Jackson, Janelle-Cheri Millen, Stacey Stern, Crystal Fancher, Janie Grumley

Saint John's Cancer Institute, Santa Monica, CA

Background/Objective: Breast cancer patients with multiple tumors or large (>5cm) tumors are traditionally offered mastectomy as surgical treatment of their disease. Recently, extreme oncoplastic breast conservation surgery (eOBCS) has become an alternative approach in this patient population. Research regarding the safety and oncologic success has been promising, but there is a paucity of data comparing the outcomes of eOBCS to those of mastectomy patients at the same institution. We aimed to evaluate patients with multiple or large tumors and analyze outcomes based on subsequent surgical management.

Methods: We reviewed our prospectively maintained single institution database of patients with primary breast cancer inclusive of multiple ipsilateral breast tumors or single breast tumor >5cm identified pre-operatively who underwent either eOBCS or mastectomy. Patient demographics, pathologic features, and outcomes were evaluated. Patients with distant metastases at disease presentation were excluded.

Results: Between April 2018- October 2023, 60 patients underwent surgical treatment of large and/or multifocal/multicentric breast cancer. Forty-three (72%) patients had tumors greater than 5cm, 9 (15%) had multicentric tumors, and 3 (5%) had multifocal disease. Average maximum tumor size was 63mm for those with large tumors and 27mm for those with multifocal/multicentric disease. The median number of tumors in patients with multiple tumors was two. There were 47 patients who underwent eOBCS and 13 patients who underwent planned mastectomy as the initial oncologic operation. There was no significant difference in age, BMI, or genetic testing rates between cohorts. Patients who underwent mastectomy were less likely to have a history of hormone replacement therapy (p=0.06). Mastectomy patients had larger average maximum tumor diameter compared to eOCBS patients although this was not significant (61mm vs. 51mm, p=0.2). Of patients who underwent planned mastectomy, two (15%) required re-excision. Of the patients who underwent eOBCS, 51% of patients underwent a second surgery for close or positive margins and three patients underwent multiple subsequent surgeries to obtain negative margins. Six eOBCS patients (13%) ultimately underwent mastectomy. Mastectomy patients were less likely to undergo external beam radiation therapy but this did not reach statistical significance (62% mastectomy vs. 83% eOCBS, p=0.09). Cosmetic revision rates for mastectomy patients were 23% compared to 11% for eOCBS patients (p=0.24). There were two local recurrences in the eOBCS cohort with all patients alive at last follow up. There was one distant recurrence and subsequent death in the mastectomy cohort.

Conclusions: Although re-excision rates in our eOBCS patients were higher than reported for typical OBCS, breast conservation was successful in almost 90% of patients undergoing eOBCS who traditionally would have been recommended mastectomy. Disease recurrence rates were low in our study, and were not higher for the eOCBS patients compared to mastectomy patients.

1686451 - Is Oncoplastic Surgery Safe in High-risk Breast Cancer Phenotypes?

Gabriel De la Cruz Ku[1], Carly Wareham[2], Caroline King[2], Akash Koul[2], Anshumi Desai[3], Sarah Persing[2], Salvatore Nardello[2], Christopher Homsy[2], Abhishek Chatterjee[2]

[1]University of Massachusetts Medical School, Worcester, MA, [2]Tufts Medical Center, Boston, MA, [3]University of Miami Medical School, Miami, FL

Background/Objective: Oncoplastic surgery (OPS) has increased in popularity over the recent years and it has become a potential alternative to breast conserving surgery (BCS) for breast cancer due to the optimal surgical and oncological outcomes with better patient satisfaction. However, there is a lack of evidence on the effectiveness and safety of OPS+RT in high-risk breast cancer phenotypes, such as TNBC and HER2+ patients. Our aim was to compare the breast cancer specific survival (BCSS) in OPS with radiotherapy (+RT) compared to PM+RT and mastectomy without radiotherapy (-RT).

Methods: Patient data were analyzed from the Surveillance, Epidemiology, and End Results (SEER) cancer registries from January 1, 2012 to December 31, 2020. Patients were stratified according to the type of surgery. Cox Regression analysis was performed to assess prognostic factors of breast cancer specific survival (BCSS).

Results: From a total of 11,219 patients with breast cancer, 180 underwent OPS+RT; 13,402, PM+RT; and 11,039 MTX-RT. OPS+RT was more frequently performed in younger (mean age of 65.53 years, SD:9.29, $p< 0.001$), non-Hispanic White (90.5% vs. 77.7%, vs. 76.3%) and single women (17.9% vs.12.1% vs. 13.3%). MTX-RT was usually performed in patients with high histological grade, TNBC, and higher stages. Overall complication rates were higher in the MTX-RT, compared to OPS+RT and PM+RT, 2%, 1.1%, and 0.7%, respectively, $p< 0.001$. Rates of hematoma and surgical site infections were higher in the MTX-RT group. With a median follow-up of 46 months, OPS+RT had better BCSS rates at 5 years compared to BCS+RT and MTX-RT (97.1% vs. 94.7%, vs 89.8%, $p< 0.001$). MTX-RT was found to be an independent prognostic factor of worse BCSS compared to OPS+RT (HR=2.584; 95% CI:1.005-7.171), while BCS+RT had no difference compared to OPS+RT (HR=1.670, 95%CI: 0.624-4.469).

Conclusions: OPS is safe with respect to surgical and oncological outcomes among patients with HER2+ and TNBC. Patients with high-risk phenotypes who underwent OPS +RT and have similar BCSS and complication rates compared to PM +RT, while it has demonstrated to be superior to MTX -RT in both aspects. OPS may be a safe option to be offered to all patients with breast cancer regardless of the phenotype and encouraged over mastectomy when possible.

1685457 - Postoperative Infections in Patients Undergoing Lumpectomy With and Without Closure of Defect

Emily Palmquist[1], Risa Kiernan[2], Varadan Sevilimedu[3], Tiana Le[3], Monica Morrow[3], Mahmoud El-Tamer[3]

[1]University of Washington, Seattle, WA, [2]Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ, [3]Memorial Sloan Kettering Cancer Center, New York, NY

Background/Objective: Postoperative infection rates in breast cancer patients range from 3-19%, despite breast surgery being classified as a clean procedure. These infections may lead to hospitalizations, delays in adjuvant treatment, and increased psychological burden for patients. Following a lumpectomy, management of the tissue defect may include simple skin closure, or oncoplastic closure. Oncoplastic closure involves tissue rearrangements and closure of the defect, resulting in improved cosmetic results. However, the effect of lumpectomy defect repair on postoperative wound infection rates is not well understood. The aim of this study was to determine if closure of lumpectomy impacts postoperative wound infection rates.

Methods: This retrospective single-institution analysis included patients undergoing lumpectomy with or without closure of the defect treated between 2018-2020. Clinicopathologic and treatment data were collected from our institutional tumor registry and medical records. Surgical closure of defect, if performed, and technique were collected from operative reports. Antibiotic use was collected from medical records. Patients receiving antibiotics on postoperative days 5-30 were reviewed to confirm true wound infection and classify severity of infection. Patients who underwent re-excison were excluded from analysis because data on postoperative antibiotic use were recorded only from the time of the last procedure. Univariate and multivariable logistic regression analysis was conducted to study associations between risk factors and postoperative breast infections.

Results: A total of 3937 patients met study eligibility criteria, with 2273 patients (58%) having their partial mastectomy defect repaired by glandular displacement. The postoperative wound infection rate was 8.4% (332), with 213 (64%) breast infections and 132 (40%) axillary infections. A true surgical site infection as defined by the United States Centers for Disease Control and Prevention was seen in 70 (1.8%) patients. On univariate analysis, risk factors that were predictors of increased postoperative breast infection included age ≥60 years (odds ratio [OR] 1.48, p=0.007), diabetes (OR 1.78, p=0.009), hypertension (OR 1.48, p=0.019), and BMI ≥30 (OR 1.88, p=0.001). Repair of the lumpectomy defect was protective against developing a postoperative breast infection (OR 0.70, p=0.040), as compared to no closure of defect. On multivariable analysis, repair of defect appears to have a trend toward decreased breast infection rates, although this was not statistically significant (OR 0.71, p=0.053). Body mass index (BMI) ≥30 was the only risk factor that remained a significant predictor of increased breast infection rates (OR 1.62, p=0.021) on multivariable analysis (Table). In patients undergoing axillary surgery, there were lower rates of axillary infection in patients who had sentinel lymph node biopsies as compared to axillary node dissections (OR 0.46, p=0.012) on multivariable analysis.

Conclusions: In this study, oncoplastic closure of lumpectomy defects resulted in a trend toward lower rates of postoperative breast infections. This may be related to decreased rates or size of seroma development. As oncoplastic techniques continue to be adopted in breast-conserving surgery, it is important to further study the protective nature of lumpectomy defect closure on postoperative infection rates.

Table 1: Univariate and multivariable analyses of associated factors in postoperative breast infections following lumpectomy
Abbreviations: CI, confidence interval; BMI, body mass index

Variables	Univariate Analysis		Multivariable Analysis	
	OR (95% CI)	*p*	*OR (95% CI)*	*p*
Age ≥ 60 years	1.48 (1.11 -1.97)	0.007	1.29 (0.96-1.74)	0.090
Diabetes	1.78 (1.16-2.75)	0.009	1.42 (0.90-2.26)	0.130
Hypertension	1.48 (1.07-2.06)	0.019	1.19 (0.84-1.70)	0.300
BMI ≥ 30	1.88 (1.33-2.65)	0.001	1.62 (1.13-2.32)	0.021
Repair of defect	0.70 (0.50-0.98)	0.040	0.71 (0.51-1.00)	0.053

1687339 - Chest Wall Perforator Flaps - Oncological and Surgical Outcomes in a Tertiary Referral Center

Claire Keohane, Yareen Fattah Agha, Ruth Prichard, Michael Boland, Damian McCartan, Claire Rutherford

St Vincent's University Hospital, Dublin, Ireland

Background/Objective: Oncoplastic breast conserving surgery has evolved to allow for higher breast volume excision without compromising cosmesis. Volume replacement, involving the use of autologous tissue, aims to fill the excised defect thus eliminating deformity and maintaining breast appearance. There are a variety of chest wall perforator flaps (CWPF) including LICAP (lateral intercostal artery perforator), AICAP (anterior intercostal artery perforator), and (medial intercostal artery perforator) MICAP flaps. The aim of this study was to assess the oncological and surgical outcomes of patients undergoing chest wall perforator flaps in a single tertiary centre.

Methods: A retrospective database was created analysing all patients who underwent partial breast reconstruction using a CWPF in a single tertiary centre in Dublin. Data collected included patient demographics, tumour characteristics, type of perforator flap and complications. Re-excision was defined as a positive margin(s) requiring re-excision following inset of the CWPF. Descriptive analyses (mean, median and percentages) were used to analyse the data set.

Results: Between November 2017 and November 2023, twenty-three patients underwent partial breast reconstruction using a CWPF. Mean age was 53 years old (35-76). Fourteen patients presented symptomatically, with the remaining 9 patients diagnosed via the national breast screening programme. Median whole tumour size was 25mm (15-60) based on the maximum size on any imaging modality (mammogram, ultrasound, MRI). Median specimen weight was 60 grams (15.5-205). Invasive ductal carcinoma accounted for 69.5% (16/23) of invasive cancers followed by invasive lobular carcinoma 13% (3/23). DCIS accounted for 13% (3/23) of the patient cohort with one case of a borderline phyllodes tumour. The majority of patients underwent a single-stage procedure (17/23, 73.9%), with six patients undergoing a two-stage procedure whereby the excision cavity was filled with water pending pathology results. Of the 23 flaps, 15 were LICAP flaps (65.2%), 5 AICAP flaps (21.8%) and 3 MICAP flaps (13.0%). The re-excision rate was 8.7% (2/23), with a 13.0% (3/23) conversion to mastectomy rate. Overall complication rate was 13.0% (3/23) with all being post-operative infections. None required return to theatre. There were no flap losses.

Conclusions: Chest wall perforator flaps are a safe means of providing volume replacement in breast conserving surgery with acceptable oncological outcomes and post-operative complication rates. This study highlights the role for oncoplastic breast surgery techniques in the treatment of higher volume breast excision. Going forward, a larger prospective patient cohort and longer-term follow-up is required.

1687911 - Oncoplastic Surgery with Volume Replacement versus Mastectomy with Implant-based Breast Reconstruction: Early Post-operative Complications in Patients with Breast Cancer

Gabriel De la Cruz Ku[1], Carly Wareham[2], Anshumi Desai[3], Meera Singhal[2], Caroline King[2], Alexis Narvaez Rojas[3], Sarah Persing[2], Christopher Homsy[2], Salvatore Nardello[2], Abhishek Chatterjee[2]

[1]University of Massachusetts Medical School, Worcester, MA, [2]Tufts Medical Center, Boston, MA, [3]University of Miami Medical School, Miami, FL

Background/Objective: Two common surgical approaches for breast cancer are breast-conserving surgery and mastectomy with implant-based breast reconstruction (MIBR). However, in the context of a large tumor, an alternative approach may involve oncoplastic surgery with volume replacement (OPSVR). OPSVR aims to preserve breast tissue and shape by utilizing local/regional flaps to auto-augment the resection defect caused by the large tumor. OPSVR is typically indicated for moderate to large partial mastectomy defects. The literature comparing OPSVR with MIBR remains limited. To address this gap, we undertook a comprehensive analysis comparing OPSVR with MIBR focusing on the 30-day post operative complications among breast cancer patients.

Methods: A retrospective cohort study was conducted using data from the National Surgical Quality Improvement Program (NSQIP) database spanning from January 2010 to December 2020.The study population included only breast cancer patients categorized into two cohorts according to the surgical technique: OPSVR and MIBR. Demographic information, comorbidities, operative factors, and postoperative outcomes were analyzed using descriptive statistics. Logistic regression analysis was used to assess independent risk factors for total, surgical, and wound complications.

Results: Within a cohort of 27,549 breast cancer patients, 996 underwent OPSVR, while 26,553 underwent MIBR. From 2010 to 2020, the adoption of OPSVR gradually increased over the years ($p< 0.001$), whereas MIBR remained relatively constant. OPSVR patients were generally older (54.93 vs. 51.75 years, $p< 0.001$), exhibited higher BMI (29.00 vs. 27.08, $p< 0.001$), and had a greater prevalence of diabetes mellitus (8.5 vs. 5.3%, $p< 0.001$) and polypharmacy (32.7% vs. 24.4%, $p< 0.001$). However, smoking status, functional health status, COPD, CHF, renal failure, dialysis, diagnosis of distant cancer, previous wound infections, use of steroids, weight loss, bleeding disorders, transfusions, and preoperative sepsis displayed comparable frequencies across both groups. Patients undergoing OPSVR demonstrated higher ASA classification (2.19 vs. 2.14, $p=0.006$), shorter operative time (176.48 vs. 210.63 min, $p< 0.001$), and most of OPSVR were outpatient procedures (60% vs 29.6%, $p< 0.001$). Outcome analysis revealed a trend towards fewer total complications in OPSVR patients (4.2 vs. 5.6%, $p=0.064$), with similar rates observed for surgical (0.7 vs 1.1%, $p=0.23$) and wound complications (3.0 vs. 3.9%, $p=0.14$). OPSVR also tended to have lower frequency of deep surgical site infections (0.3 vs. 0.8%, $p=0.077$) and returns to the operating room (1.3 vs. 2.5%, $p=0.068$). No significant differences emerged in various other complications, including superficial skin infections, graft issues, and postoperative sepsis. Multivariate analysis, adjusted for baseline characteristics, indicated that the surgical approach was not an independent risk factor for total, surgical, or wound complications, however higher BMI, smoking status, and longer operative time were identified as risk factors for these complications.

Conclusions: OPSVR has become a popular technique throughout the years for patients with breast cancer. Despite treating a patient population with more significant health challenges, OPSVR demonstrates reasonable and safe outcomes when compared to MIBR. It should be considered an alternative breast surgical option to MIBR in the appropriate patient with larger breast cancers.

Other

1688579 - Low Rates of Endocrine Therapy Adherence Following Radiation Therapy Omission Lead to Under Treatment in Older Women with Early-stage Breast Cancer

Lena Turkheimer, Kara Romano, Maria Del Rocio Reyes, Fabian Camacho, Roger Anderson, Shayna Showalter

University of Virginia, Charlottesville, VA

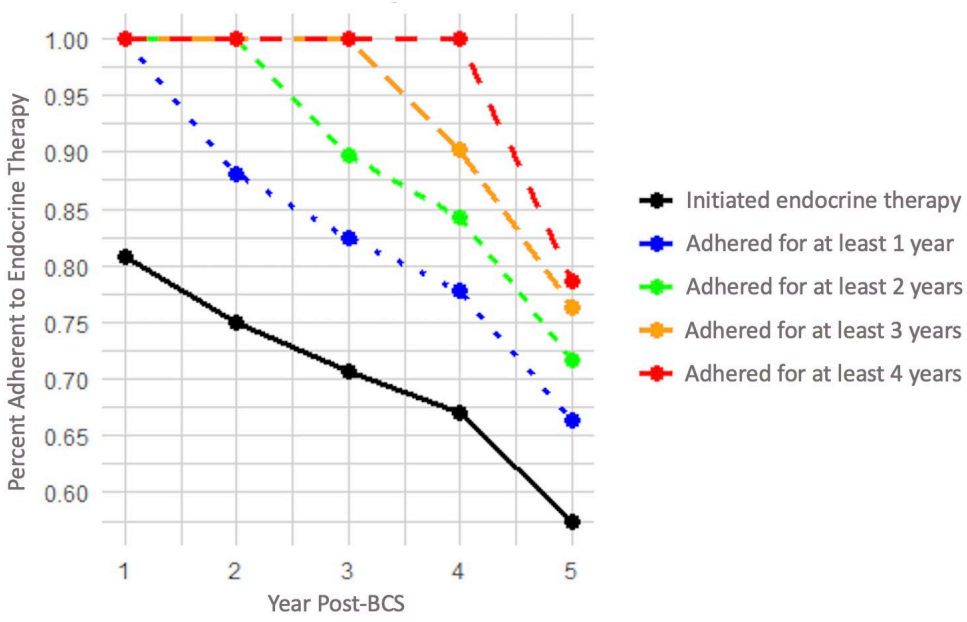
Background/Objective: Clinical trial data support the omission of radiation therapy (RT) in older women with early-stage breast cancer who take adjuvant endocrine therapy (AET). However, AET adherence is low, leading to possible under-treatment in those who omit RT. AET and RT provide a similar local control benefit, but RT is delivered and completed in the immediate post-operative window, whereas AET is prescribed for 5+ years. This study assessed modern treatment and AET adherence patterns to aid patient-provider decision-making.

Methods: The SEER-Medicare database was used to identify women aged ≥ 65 years diagnosed with ER+/HER2-, N0/Nx breast cancer who underwent breast-conserving surgery (BCS) from 2011-2019 with at least 12 months of Part D Medicare post-diagnosis. An annual medicine possession ratio (MPR) ≥0.8 was used as a surrogate for AET adherence. RT receipt was determined using Medicare billing data. Multivariate logistic regressions were performed to identify factors that predict treatment.

Results: The study cohort included 31,904 women: 71.6% received RT and 82.8% initiated AET. Of those treated with RT, 87.6% initiated AET. Of those who did not receive RT, 70.5% initiated AET. In addition to BCS, 62.8% had RT + AET, 20.0% had AET alone, 8.9% had RT alone, and 8.4% had no adjuvant therapy. When factoring in at least 1 or 2 years of AET adherence, the proportion of patients treated with BCS alone increased to 13.1% and 17.5%, respectively. For those who initiated AET, adherence decreased each year post-BCS. The likelihood of taking AET for five years increased with each completed year of therapy post-BCS (Figure 1). Predictors of being treated with BCS alone were: older age (aOR 8.84, 95% CI 7.74 - 10.09), tumors < 1 cm (aOR 1.50, 95% CI 1.32 - 1.70), and living in an area with few radiation facilities (aOR = 1.37, 95% CI 1.21 - 1.56). In patients who received either RT or AET following BCS, women over 80 (aOR .21, 95% CI .18 - .24) with more comorbidities (aOR .55, 95% CI .45 - .68) were less likely than younger and healthier patients to receive RT.

Conclusions: Although older women with early-stage ER+ breast cancer are still predominantly treated with RT and AET after BCS, the omission of RT in this population has increased. Importantly, this study highlights that less than 60% of those who start AET adhere for 5 years, leaving many patients under treated. Furthermore, women who omitted RT were older with more comorbidities and, therefore, may be less likely to adhere to AET long-term. This large US population-based study informs patient and provider decision-making and highlights the importance of considering AET adherence when omitting RT.

Figure 1: Increasing rates of five-year endocrine adherence with each completed year of therapy



1688451 - Feasibility of a Brief, Self-directed, Online Mindfulness Intervention in Newly Diagnosed Women with Breast Cancer: The Prepare Study

Marie Fefferman[1], David Victorson[2], Kristine Kuchta[3], Danielle Thompson[1], Catherine Pesce[3], Katherine Kopkash[3], Sandra Simovic[3], Katharine Yao[3]

[1]The University of Chicago, Chicago, IL, [2]Northwestern University, Evanston, IL, [3]NorthShore University HealthSystem, Evanston, IL

Background/Objective: After a new breast cancer diagnosis, many women experience fear, sadness, and anxiety. Mindfulness interventions have been shown to improve mental health for those who are diagnosed with cancer. The objective of this study was to assess the feasibility and potential benefit of a brief, self-directed online mindfulness intervention to reduce anxiety and depression for women with newly diagnosed breast cancer.

Methods: This was a single institution pilot study of women with newly diagnosed breast cancer who were randomized to one of two study arms: Arm 1 - watching four brief (< 2 minutes) breast cancer-focused mindfulness videos, listening to three or more mindfulness audio recordings (between 6 to 16 minutes), and reflecting on their observations in an online journal; Arm 2 - watching a selection general health videos that had nothing to do with mindfulness or breast cancer. The primary endpoint of the study was feasibility, with a secondary focus on patient anxiety. Videos were watched prior to surgery and audio recordings were listened to before and after surgery. Patient-reported outcomes of patient anxiety, depression, self-kindness, non-reactivity, psychosocial well-being, and fear of recurrence were measured using validated tools following enrollment prior to surgery (T1), one to two weeks after surgery (T2) and three months after surgery (T3). Paired t-tests and Wilcoxon rank-sum tests were used for comparisons.

Results: Forty-two women enrolled in the study out of 73 eligible women who were approached to participate. Fifteen women were randomized to the mindfulness arm (Arm 1) and 18 were randomized to general health videos (Arm 2). Eight women withdrew from the study, with most citing the time commitment as the primary reason for withdrawal. Mean age was 62 ± 9 years. There were no statistically significant differences in any patient-reported outcomes between the two arms except for a higher self-kindness score in the control arm compared to the intervention arm (p=0.01). Among mindfulness participants, most listened to between 2 and 5 audio recordings (n=12) or between 13 and 56 recordings (n=5). For mindfulness participants, anxiety levels improved from a score of 60.3 ± 6.5 at T1 to 53.5 ± 8.4 at T3 (p< 0.01). Self-kindness scores improved from 16.4 ± 4.2 at T1 to 18.6 ± 3.7 at T3 (p=0.01). Those who listened to 5 or fewer audio recordings had a larger decrease in anxiety from T1 to T3 compared to those who listened to 13 or more (p=0.03). For control participants, there were no statistically significant within group differences in patient-reported outcomes between any time point.

Conclusions: Overall, feasibility indicators were achieved (58% enrollment rate, < 20% attrition) for a multi-week, behavioral intervention. While the study was not sufficiently powered to detect between group differences, there was a significant within group decrease in patient anxiety and increase in self-compassion in the mindfulness arm. We are currently exploring alternative study designs to increase enrollment for a mindfulness intervention for patients with breast cancer.

Tables. Patient-reported outcomes (PROs) by arm at each time point

Table 1a. PRO Results Over Time, Arm 1 (Intervention)

	T1: Following Enrollment (N=15)	**T2: 1-2 Weeks Post-Surgery (N=13)**	**Change from T1 to T2**		**T3: 3 Months Post-Surgery (N=12)**	**Change from T1 to T3**	
				p-value			p-value
PROMIS Anxiety	60.3 ± 6.5	55.6 ± 8.4	-4.1 ± 7.7	0.1105	53.5 ± 8.4	-6.1 ± 7.5	**0.0029**
PROMIS Depression	50.1 ± 11.5	49.1 ± 6.9	0.9 ± 7.2	0.9397	48.9 ± 7.8	1.6 ± 9.0	0.9690
Self-Kindness Scale	16.4 ± 4.2	18.2 ± 3.7	1.2 ± 3.8	0.0963	18.6 ± 3.7	1.4 ± 2.3	**0.0144**
Non-Reactivity Scale	22.9 ± 4.4	23.6 ± 4.6	1.0 ± 1.7	0.0825	23.2 ± 4.2	0.4 ± 3.7	0.2197
BREAST-Q Psychosocial Well-Being	67.7 ± 17.6	70.2 ± 17.2	0.4 ± 17.1	0.7841	72.3 ± 17.5	0.4 ± 12.6	0.5273

Table 1b. PRO Results Over Time, Arm 2 (Control)

	T1: Following Enrollment (N=18)	**T2: 1-2 Weeks Post-Surgery (N=16)**	**Change from T1 to T2**		**T3: 3 Months Post-Surgery (N=15)**	**Change from T1 to T3**	
				p-value			p-value
PROMIS Anxiety	56.2 ± 6.3	56.9 ± 5.1	-0.2 ± 4.6	0.8652	52.2 ± 8.3	-3.6 ± 8.4	0.1166
PROMIS Depression	48.9 ± 8.0	49.3 ± 7.6	0.5 ± 5.6	0.7430	47.2 ± 7.9	-0.9 ± 7.3	0.6321
Self-Kindness Scale	19.5 ± 3.1	20.4 ± 3.3	1.0 ± 2.1	0.0628	20.4 ± 2.9	0.7 ± 2.2	0.2587
Non-Reactivity Scale	24.4 ± 4.4	24.9 ± 4.8	0.6 ± 2.4	0.3164	26.0 ± 4.3	1.2 ± 2.8	0.1152
BREAST-Q Psychosocial Well-Being	71.8 ± 16.9	68.4 ± 17.8	-2.1 ± 15.5	0.5806	74.4 ± 18.5	0.5 ± 18.0	0.9215

1688493 - Characteristics of Incident Breast Cancers Diagnosed After Benign Breast Disease

Monica Mazur[1], Tanya Hoskin[2], Bryan McCauley[2], Robert Vierkant[2], Denice Gehling[2], Jessica Fischer[2], Chris Schmelzer[2], Matt Jensen[2], Kush Lohani[2], Lisa Seymour[2], Laura Pacheco-Spann[1], Lori Denison[2], Celine Vachon[2], Stacey Winham[2], Derek Radisky[1], Mark Sherman[1], Amy Degnim[2]

[1]Mayo Clinic Florida, Jacksonville, FL, [2]Mayo Clinic, Rochester, MN

Background/Objective: Benign breast disease (BBD) is associated with a two- to four-fold increased breast cancer (BC) risk. BCs after BBD are perceived to be low stage with favorable and indolent behavior; however, data on the characteristics of BC that develop after a diagnosis of BBD in recent practice are limited. We analyzed features of BCs occurring among patients after benign biopsy in a large contemporary cohort of BBD.

Methods: We analyzed characteristics of incident BCs detected in a cohort of 4830 predominantly white women with pathologically confirmed BBD diagnosed from 2002 to 2013. BCs diagnosed within 6 months of BBD were consider prevalent and excluded. Data was extracted via retrospective chart review, follow up questionnaires, institutional databases, and Cancer Registry records. Breast cancer stage was classified according to AJCC 7th edition. Patients were classified as hormone-receptor positive (HR+) if estrogen and/or progesterone receptors were detected in ≥1% of BC cells. HER2-positive status was classified as an IHC score of 3+ or FISH amplified.

Results: 344 incident breast cancers [236 (69%) invasive, 101 (29%) DCIS, 7 unknown/other] were diagnosed at a median of 7 years (IQR: 4-10 years) after BBD biopsy. Prior BBD biopsies were classified as nonproliferative in 123 (36%), proliferative disease without atypia in 169 (49%), atypical hyperplasia in 52 (15%) based on panel review. The median age at breast cancer diagnosis was 63 years (IQR: 54-72 years), with 49 (14%) age < 50, 179 (52%) age 50-69, and 116 (34%) age ≥70 years. The majority (78%) were screen-detected, but 22% had palpable/symptomatic presentation. Among 101 DCIS cases, grade was high in 43%, intermediate in 29%, and low in 27%; 90% were HR+ and 10% were HR negative. Among the 236 invasive BCs, stage distribution was 68% stage I, 21% stage II, 10% stage III, and 1% stage IV. Nottingham grade was high in 13%, intermediate in 41%, and low in 46%; invasive tumor biologic subtypes were 89% HR+/HER2- (luminal), 8% HER2+, and 3% triple negative. Overall, 26% of invasive BCs were node positive.

Conclusions: In a modern BBD cohort including predominantly white women, the majority of subsequent BCs were invasive, diagnosed before age 70, and predominantly hormone receptor positive; 32% presented with Stage 2 or higher disease, 54% were grade 2-3, and 26% were node positive. BCs diagnosed among BBD patients include a substantial percentage of grade 2-3 and node positive tumors.

1683390 - Identifying Patients with Metastatic Breast Cancer in the Electronic Health Record via a Computational Phenotype

Sydney Record[1], Benjamin Neely[2], Michael Lee[1], Chuan Hong[3], Jennifer Plichta[1]

[1]Duke University Medical Center, Durham, NC, [2]Duke Cancer Institute, Durham, NC, [3]Duke University School of Medicine, Durham, NC

Background/Objective: Metastatic breast cancer (MBC) is a heterogenous disease. As more effective treatments become available, outcomes are improving, creating a greater need for granular data sets to better identify and stratify patients within this unique population. However, the standard method for data collection relies largely on manual chart review. Our group previously developed and evaluated a computational phenotype designed to identify patients with MBC. In the current study, we further refined this computational phenotype and developed a novel phenotype that stratifies patients with MBC into de novo and recurrent subgroups.

Methods: Patients diagnosed with breast cancer between 1/1/2022 and 1/1/2023 were identified in the electronic health record (EHR) using data from ICD codes and/or SNOMED concept identifiers. A random sample of 1,000 patients was included in this study. We developed and evaluated updated computational phenotypes, based on SNOMED concept IDs, which are downstream codes based on diagnosis names providers select during a patient encounter/visit. These phenotypes were applied to the EHR to identify patients with MBC. Contingency tables were used to aggregate and compare results.

Results: Chart review of all included patients identified 261 patients with MBC and 739 with non-MBC. Four computational phenotypes were tested. The first phenotype utilized the SNOMED code for "metastasis from malignant tumor of breast" and successfully classified 889 patients (88.9% accuracy; 92.3% sensitivity; 87.7% specificity). The next phenotype, which we previously published, builds off of the first but excludes patients with the code for "secondary malignant neoplasm of lymph nodes." It successfully classified 966 patients (96.6% accuracy; 92.3% sensitivity; 98.1% specificity). Our novel phenotype for MBC also builds off of the first, but using a more tailored approach that excludes the code for "secondary malignant neoplasm of axillary lymph nodes" and successfully classified 967 patients (96.7% accuracy; 93.9% sensitivity; 97.7% specificity). Finally, we also developed a computational phenotype that can differentiate between de novo and recurrent MBC. It successfully classified 877 patients (87.7% accuracy; 79.2% sensitive; 88.4% specificity).

Conclusions: We were able to successfully build a refined computational phenotype to identify patients with MBC. While it is slightly less specific than our previously published computational phenotype, this is our most sensitive computational phenotype for MBC yet, which is the most important performance measure for most purposes of identifying patients with MBC to create a research cohort. We also built a computational phenotype that can stratify patients with MBC into de novo and recurrent groups, though this model's performance measures require further optimization. Hospital systems whose EHRs have reliable mapping to SNOMED may be able to use these computational phenotypes for research and/or quality improvement purposes.

Table 1: Summary of naïve performance measures for each method of identifying patients with metastatic breast cancer

Performance Measure	*Accuracy (95% CI)*	*Sensitivity (95% CI)*	*Specificity (95% CI)*	*Positive Predictive Value (95% CI)*	*Negative Predictive Value (95% CI)*
SNOMED-CT Code 315004001 Only	88.9%	92.3%	87.7%	72.6%	97.0%
SNOMED-CT Code 315004001 + Removal of Code 94392001	96.6%	92.3%	98.1%	94.5%	97.3%
SNOMED-CT Code 315004001 + Removal of Code 94181007	96.7%	93.9%	97.7%	93.5%	97.3%
de novo MBC	87.7%	79.2%	88.4%	34.5%	98.2%

1682397 - Clinical-pathological Model for Optimal Selection of the 21-Gene Recurrence Score

Javier Orozco[1], Michael Simanonok[2], Nicketti Handy[1], Douglas Hanes[3], Roshanthi Weerasinghe[2], Janie Grumley[1]

[1]Saint John's Cancer Institute, Santa Monica, CA, [2]Providence Strategic and Management Services, Renton, WA, [3]Providence Portland Medical Center, Portland, OR

Background/Objective: The 21-gene recurrence score (RS), a prospectively validated multi-gene platform, is widely used to predict the benefit of adjuvant chemotherapy in patients with estrogen-receptor (ER)-positive, HER2-negative early-stage breast cancer. However, RS assay accessibility may be limited by its cost and availability, and the utilization of inexpensive models may help guide the judicious use of molecular testing and eliminate unnecessary costs. Here, we aimed to develop a clinical-pathological model to identify patients ≥50 years old who may not need 21-gene RS testing.

Methods: From 2018 to 2022, we retrospectively identified from the Providence Systemwide Cancer Registry Datamart, female patients ≥50 years old with histologically confirmed invasive breast carcinoma, pT1-T2, pN0-N1, ER-positive, and HER2-negative, who underwent primary surgical treatment. We used lasso regression for variable selection and prediction of 21-gene RS categories (low risk: RS< 18 vs. intermediate/high risk: RS ≥18). Variables included in modeling were age at diagnosis, pathological tumor size, histologic type, histologic grade, pathological regional lymph nodes (pN0 vs. pN1), progesterone receptor (PR, percent positive), HER2-IHC (0 vs. 1+), and Ki67 (percent positive). The dataset was randomly split into training (70%) and testing (30%) cohorts. We also calculated 95% confidence intervals for a threshold specificity of 90% with 2000 stratified bootstrap replicates.

Results: Of the 1,412 patients who met the study criteria, 424 patients (30%) were included in the testing cohort (Figure A). The median (IQR) age at diagnosis was 63 years (57 - 69). The median (IQR) pathologic tumor size was 1.5 cm (1.1 – 2.1), and most tumors were PR-positive (89%), invasive ductal (82%), histologic grade 2 (62%), and pN0 (81%). Variable selection demonstrated that pathological grade 3 was the most influential coefficient in the model (regression coefficient: 1.31), whereas tumor size and age at diagnosis were removed from the model. The model performance in the testing cohort revealed an area under the curve of 0.78 (95% CI: 0.73 – 0.82) at the threshold specificity of 0.9 (95% CI: 0.86 – 0.94) with a sensitivity of 0.52 (95% CI 0.44 – 0.59, Figure B). The false positive rate for identifying low-risk 21-gene RS was 8.1%, while the false negative rate for intermediate/high-risk scores was 54.8%. There was a good calibration of the model, with the prevalence of the 21-gene RS categories roughly mirroring increases in predicted probabilities (Figure C).

Conclusions: Our model showed a high specificity with a low false positive rate (8.1%) for identifying low-risk 21-gene RS. As a result, there is a possibility of minimizing the need for testing in low-risk patients. These findings suggest the potential utility of the developed clinical-pathological models in identifying a subset of patients aged 50 and above who may safely omit the 21-gene RS assay. Further validation and refinement of the model could enhance its clinical applicability.

Figures A-C.

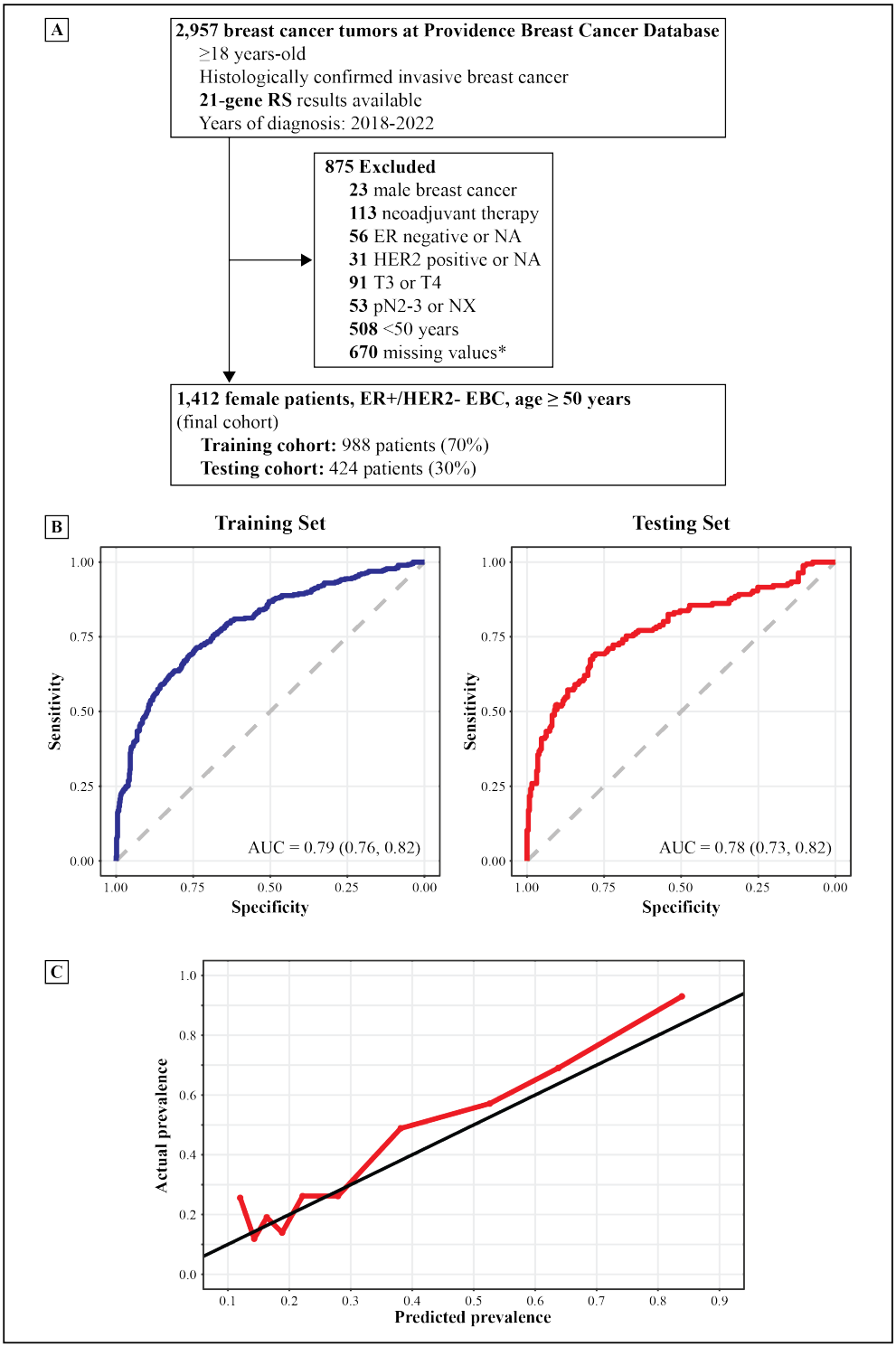


Figure. A. Patient selection criteria. **B.** ROC curves displaying the performance of the model in the training cohort (n = 988) and the testing cohort (n = 424). **C.** Calibration plot showing the model performance in the testing set.

1684709 - Can We Do More? A Pilot Study of Rhode Island Healthcare Providers Knowledge of Breast Cancer Screening Guidelines for TGD Patients

Sindi Diko[1], Julie Peck[1], Jamie Patterson[2], Stephanie Ng[1], Ashley Stuckey[1], Jennifer Gass[1], David Edmonson[1], Micaela Weaver[1]

[1]Women and Infants Hospital/Brown University, Providence, RI, [2]Women and Infants Hospital/Brown University, Warwick, RI

Background/Objective: The transgender and gender diverse (TGD) population in the United States is growing and continues to face disproportionate health issues (1). In 2021, the American College of Radiology (ACR) published guidelines for breast cancer screening in TGD patients (2). Despite this, many providers may be unaware, unfamiliar, or uncomfortable with these breast cancer screening guidelines. Additionally, TGD patients may be unaware of the need for breast cancer screening. In this pilot study, we aim to assess Rhode Island (RI) healthcare providers knowledge and implementation of, as well as barriers to, breast cancer screening and cancer risk assessment for TGD patients.

Methods: An Institutional Review Board-approved email survey was distributed using Qualtrics. Informed consent, 2 pre-screening questions, 7 non-identifying demographics questions, and 10 survey questions were included. Fully licensed or in-training RI healthcare providers (MD/DO, NP, PA) with at least 50% patient-facing clinical practice were included. Approximately 200 survey invitation emails were sent to providers (breast, gynecologic oncology, OB/GYN, plastic surgery, family medicine) as well as TGD care focused clinics. Incomplete surveys were excluded.

Results: We report on 26 respondents yielding a 13% response rate (Table 1). Most were aged 30-39 (54%) with 6-10 years in practice (42%). Fifty-four percent were fellowship-trained breast surgeons or OB/GYNs and 77% worked in an urban setting. Seventy-seven percent identified as cis-gendered female and 73% reported 1-25% of their practice identified as TGD. Sixty-five percent of participants reported providing mammographic screening for cisgender and TGD patients, while 23% reported screening cisgender but not TGD patients, with most of the latter group lacking a TGD patient population. Fifty-eight percent of participants report providing breast cancer risk assessment for cisgender and TGD patients. Regarding ACR guidelines for TGD screening, one participant reported reading the guidelines, while 65% of participants reported little familiarity with the guidelines. Lack of knowledge regarding the role of mammographic screening for TGD patients was reported by 38% participants. Additionally, 69% of responding providers believed TGD patients were unsure or unaware about their own need for breast cancer screening. Participants suggested professional society guidelines (69%), image screening locations focused on TGD patients (46%), and electronic medical record reminders/pop-ups (38%) would increase provider comfort with breast cancer assessments and screening for TGD patients. Patient barriers were reported to be perceived as unfamiliarity for screening (85%), an uncomfortable screening environment (69%), and previous discrimination in the mammographic screening setting (50%).

Conclusions: This study demonstrates the limited knowledge amongst RI healthcare providers of the current breast cancer screening guidelines for TGD patients. A nationwide initiative to deliver both provider and patient breast cancer screening and guidelines education may facilitate addressing this gap in care for a potentially marginalized population.

Table 1: Survey questions

Variable	Category	Count (n, %)
How familiar are you with transgender and gender diverse breast cancer screening guidelines as defined in the American College of Radiology ACR Appropriateness Criteria® Transgender Breast Cancer Screening?		
	Very familiar, I have read them	1 (4%)
	Somewhat familiar, I have heard about them	8 (31%)
	Not very familiar, I may have heard something about them	11 (42%)
	Not familiar at all, no idea these existed	6 (23%)
Do you discuss and/or recommend mammograms for transgender/gender diverse patients based on the above guidelines?		
	Yes	7 (27%)
	Yes, but I use different guidelines	1 (4%)
	No, I did not know they existed	10 (38%)
	No, I do not believe there is enough data to support those guidelines	0 (0%)
	No, I refer to another healthcare provider to order mammograms for these patients	3 (11.5%)
	No, I do not see any transgender/gender diverse patients	2 (8%)
	Other: Have not had transgender/gender diverse patients come to my office	3 (11.5%)
How aware do you believe the majority of your transgender/gender diverse patients are of current breast cancer screening recommendations ?		
	They are unsure whether they require breast cancer screening	12 (46%)
	I do not have any transgender/gender diverse patients	7 (27%)
	They are not aware they may need breast cancer screening	6 (23%)
	They are aware they may require breast cancer screening but are not doing so	1 (4%)
	They are aware of the recommended breast cancer screening appropriate for them and are actively undergoing screening or will undergo screening when recommended	0 (0%)
Is breast cancer screening part of your practice? *(This includes but is not limited to: clinical breast exams and/or ordering mammograms, breast cancer prevention and risk assessment conversations, referring patients to breast care specialists)*		
	Yes, for cisgender, transgender, and gender diverse patients	17 *(65%)*
	Yes, for cisgender patients because I do not see transgender/gender diverse patients	6 *(23%)*
	No, not for any patient, regardless of gender identity	2 *(8%)*
	Yes, for cisgender patients but not transgender or gender diverse patients	1 *(4%)*
Do you perform breast cancer risk assessment for transgender/gender diverse patients *(including but not limited to discussing family history of cancers, review hormone use, identify age of menarche and menopause for patients assigned female at birth? This may or may not include use of a formal tool such as Gail Model or Tyrer-Cuzick)*		
	Yes, for cisgender, transgender, and gender diverse patients	15 (58%)
	Yes, for cisgender patients because I do not see transgender/gender diverse patients	5 (19%)
	Yes, for cisgender patients but not transgender or gender diverse patients	3 (11.5%)
	No, not for any patient, regardless of gender identity	3 (11.5%)

1684217 - A Qualitative Study of Surgeon Perspectives on Axillary Management Following Neoadjuvant Endocrine Therapy – Results from the PELOPS Clinical Trial

Anna Weiss[1], Anna Revette[2], Brett Nava-Coulter[2], Elizabeth Mittendorf[3], Otto Metzger Filho[2], Tari King[3]

[1]University of Rochester, Fairport, NY, [2]Dana-Farber Cancer Institute, Boston, MA, [3]Brigham and Women's Hospital, Boston, MA

Background/Objective: There are no evidence-based guidelines for surgical management of the axilla following neoadjuvant endocrine therapy (NET). The aim of this study was to explore surgeon decision-making regarding axillary surgery after NET, specifically whether to perform or omit axillary lymph node dissection (ALND) for patients who were clinically node-negative at presentation, but were found to have pathologic nodal disease after NET.

Methods: We performed semi-structured interviews of surgeons (N=56) who practice at sites (N=11) that participated in the Palbociclib and Endocrine therapy for LObular breast cancer Preoperative Study (PELOPS). PELOPS was a multi-institution clinical trial that randomized patients to NET with or without palbociclib; the primary endpoint (rate of pathologic complete response) was previously reported. Axillary surgery was not prescribed, allowing for institution and surgeon variation. Interviews were performed until meaning saturation was reached. The interviews were recorded and transcribed verbatim and thematic analysis was conducted.

Results: Fifteen surgeons were interviewed from 4 institutions, a participation rate of 26.8% representing 36.4% of participating sites. Six self-reported their race/ethnicity as non-Hispanic White, 4 Asian, 2 Black, 1 Hispanic, 2 preferred not to say; all identified as female. Median years in practice were 4 (1.5-25), most considered their practice academic (93.3%), and all were breast-only. Five reported seeing 6-16 new patients per month, 6 seeing 17-25, and 4 seeing >25. Overall, participants noted that this population was rare, making the collection of data and development of guidelines difficult. While participants noted that their decisions pertaining to ALND were influenced by department-specific guidelines. Across all participants, two distinct groups emerged. One group extrapolated the results of upfront surgery clinical trials like Z0011 and AMAROS to the NET-treated population, and only performed ALND if there was a compelling reason. The other always performed ALND if there was pathologic nodal disease following NET, as they do after neoadjuvant chemotherapy. This latter group felt that because there is no level I evidence, NET-treated patients could not be treated as upfront surgery, and ALND could not be omitted at this point. The groups also differed in their beliefs regarding ALND as solely diagnostic, or as therapeutic. Despite their distinct approaches to ALND, all participants felt that multi-disciplinary considerations were critical, and that medical and radiation oncology should contribute to these surgical decisions. Participants also emphasized the importance of formal guidelines to standardize care. There was general agreement that more data is needed to create guidelines for the NET population; however, they noted a clinical trial specific to NET-treated patients would be difficult to accrue because it is a rare population.

Conclusions: In the absence of data or consensus guidelines, surgeons are making decisions about the omission of ALND after NET based on strongly held beliefs or extrapolation of clinical trial results from other patient populations. All agree that more data is needed to guide axillary surgical management following NET.

1683466 - Combined Risk-reducing Breast and Gynecologic Surgery: Efficient or Ill-advised?

Kathryn Eckert, Courtney Day, Carrie Langstraat, Tina Hieken

Mayo Clinic, Rochester, MN

Background/Objective: Patients with an elevated risk of future breast and gynecologic cancers, mainly due to a germline pathogenic variant mutation and/or strong family cancer history, are candidates for risk-reducing operations to decrease their lifetime cumulative risk of breast and ovarian cancer. While risk-reducing procedures are one standard of care option for these patients, there is limited data available regarding the outcomes of performing these operations as a combined procedure under one anesthetic event. We aimed to better characterize postoperative occurrences in patients undergoing breast and gynecologic operations under a single anesthetic.

Methods: We identified patients undergoing simultaneous breast and gynecologic procedures from 2009 to 2022. Patients were identified by diagnosis codes in association with breast and gynecologic procedure codes completed during the same anesthetic event. We evaluated 30- and 60-day postoperative occurrences, in addition to achievement of desired outcome at one year.

Results: 43 patients with a median age of 47.6 (range 24-77) years met our inclusion criteria of having combined breast and gynecologic procedures during the same anesthetic event. Of these patients, 35 (81.4%) had a strong family history of breast cancer and 23 (53.5%) had a documented genetic pathogenic variant. 16 patients (37.2%) underwent prophylactic gynecologic surgery concurrently with second stage breast reconstructive surgery, primarily tissue expander to implant exchange. Overall, 8 complications requiring intervention were observed within 60 days of surgery, most commonly seroma (37.5% of all complications observed) which required aspiration in all instances. Urinary tract infection, pulmonary embolism, flap ischemia, and ureteral injury were the other observed complications (Table). Complications were observed more often in patients undergoing prophylactic gynecologic surgery concurrently with primary breast surgery (including mastectomy and breast conservation) than with second stage breast reconstructive surgery (6/27 patients versus 2/16 patients, OR 2.1, 95% CI 0.37, 11.96, $p = 0.40$). 40 patients (93.02%) had achieved their desired outcome one year after surgery.

Conclusions: Patients at elevated risk of future breast cancer undergoing risk-reducing procedures can be offered these procedures during the same anesthetic event with an acceptable risk of morbidity. Those undergoing staged reconstructive breast surgery may benefit from the coordination of prophylactic gynecologic procedures at the time of their second stage breast surgery to minimize morbidity. Performing these surgeries concurrently is an efficient approach in the high-risk population who is seeking these procedures in a prophylactic setting. Concurrent surgeries may decrease risk attributable to anesthesia, time away from family, and time out of the workforce with potential to increase the patient's ability to achieve their desired outcome.

Table 1: Post-operative occurrences

Patient	Breast Procedure	Gynecologic Procedure	Post-Operative Occurrence	Intervention	Desired Outcome at One Year?
1	TE to Implant Exchange	Vaginal Hysterectomy, Laparoscopic BSO	Ureteral Injury	Return to OR for Stent Placement	Yes
2	TM	Robotic Assisted Hysterectomy, BSO, Appendectomy	Chest Wall Seroma	Aspiration	Yes
3	NSM	Robotic Assisted Hysterectomy, BSO	Flap Ischemia	Hyperbaric Oxygen Therapy	Yes
4	BCS	Vaginal Hysterectomy, Laparoscopic BSO, Suprapubic Catheter Placement	Urinary Tract Infection	Antibiotic Course	Lost to Follow-up
5	TM	Vaginal Hysterectomy, Laparoscopic BSO, Pelvic Lymphadenectomy	Pulmonary Embolism	Readmission & Anticoagulation	Yes
6	TM	Vaginal Hysterectomy, Laparoscopic BSO	Chest Wall Seroma	Aspiration	Yes
7	TM	TAH, BSO, Omentectomy, Pelvic Lymphadenectomy	Chest Wall Seroma	Aspiration, Drain Placement & IR Sclerotherapy	Yes
8	TE to Implant Exchange	Vaginal Hysterectomy, Laparoscopic BSO	Urinary Tract Infection	Antibiotic Course	Yes

TE = Tissue Expander, SSM = Skin Sparing Mastectomy, TM = Total Mastectomy, BCS = Breast Conserving Surgery, NSM = Nipple Sparing Mastectomy, BSO = Bilateral Salpingo-oophorectomy, TAH = Total Abdominal Hysterectomy

1688427 - De-escalation of Axillary Surgery Impacts Surgical Trainee Experience

Jenna Sturz, Courtney Day, Mara Piltin, Judy Boughey, Mary Mrdutt

Mayo Clinic, Rochester, MN

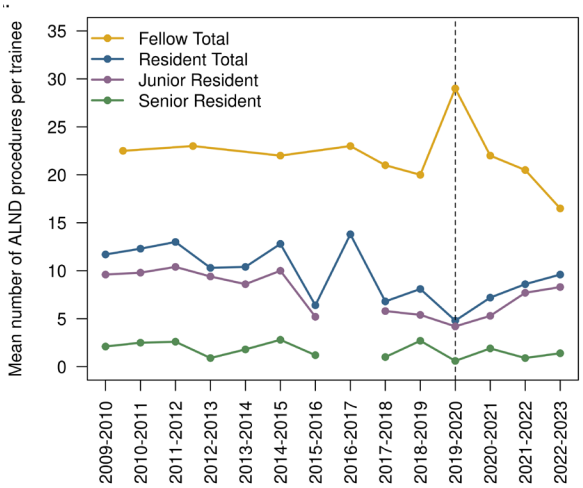
Background/Objective: Surgical management of the axilla in breast cancer has drastically evolved over the past two decades. With contemporary management, many patients having surgery for breast cancer upfront or post-neoadjuvant therapy no longer require an axillary lymph node dissection (ALND). The aim of this study was to determine how practice changes are impacting surgical residents and fellows operative experience, specifically the number of ALNDs and for residents the timing in training of ALNDs. Additionally, we explore if previous approaches with ACGME data adequately captures resident ALND exposure.

Methods: With institutional IRB review, Accreditation Council for Graduate Medicine Education (ACGME) and Society of Surgical Oncology (SSO) case logs for surgical trainees at our institution were reviewed and de-identified (graduating years GY 2010-2023). ALND for surgery resident included modified radical mastectomy (MRM), radical mastectomy and major lymphadenectomy categories from the ACGME Experience Report. Cases performed as surgeon junior (SJ), surgeon chief (SC) or teaching assistant (TA) were included with first assist cases excluded. ALND for breast surgical oncology fellow included ALND and MRM categories from the SSO case log. Trends in ALND performed were evaluated with univariate linear regression models. Percentage of ALND as a junior (SJ) versus senior resident (SC or TA) was evaluated. Lumpectomy with and without ALND is a combined category on the ACGME Experience Report. Use or omission of this category may over or under capture ALND experience. To address this limitation CPT Code Summary reports were reviewed for available years (GY 2019-2023) to identify the proportion of ALNDs not captured based on Experience Report data.

Results: Case logs from 133 graduating general surgery residents and 21 breast surgical oncology fellows were reviewed. Overall mean number of resident ALNDs was 9.5 (range:0-40); 82% were junior cases. Number of resident ALNDs decreased over time (estimate -0.41 per year; $p=0.010$, Fig1A) with a mean of 11.7 (range:2-23) per 2010 resident versus 9.6 (range:1-24) in 2023. Junior ALND cases decreased over time while senior cases remained stable, mean 1.7 (range:0-15). Variability in the number of ALNDs/resident within a graduating class is seen (Fig 1B). Fellows performed a mean of 22.0 (range:14-32) ALND/year, with a mean of ≥20 for all GY except 2023 ($p=0.16$). When evaluating case log reports differences for 41 residents over 4 years, 60% of ALNDs performed were not captured via the Experience Reports. On average 4.0 additional ALNDs per resident are identified with CPT level evaluation via the Code Summary format.

Conclusions: We demonstrate the number of ALNDs performed by surgical residents decreased overtime and that ALND experience occurs primarily as a junior resident. A decrease in fellow ALND was not observed which may be driven by specific fellowship ALND case requirements. We also found that ACGME Experience Reports did not capture 60% of resident ALNDs. Defining the impact of practice changes is paramount to ensure surgeons are appropriately trained. Rotation restructuring and educational adjuncts such as cadaveric and simulated models may be needed to ensure adequate training as ALND is decreasingly performed.

Figures: Number of axillary dissection cases performed by surgical trainees over time



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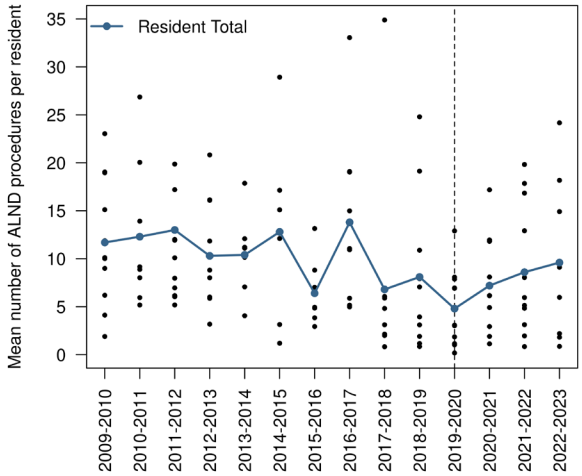


1679370 - Impact of Postpartum Diagnosis on Survival Outcomes in Inflammatory Breast Cancer

Jennifer Chen, Rebecca Slack Tidwell, Megumi Kai, Helen Johnson, Anthony Lucci, Wendy Woodward

The University of Texas MD Anderson Cancer Center, Houston, TX

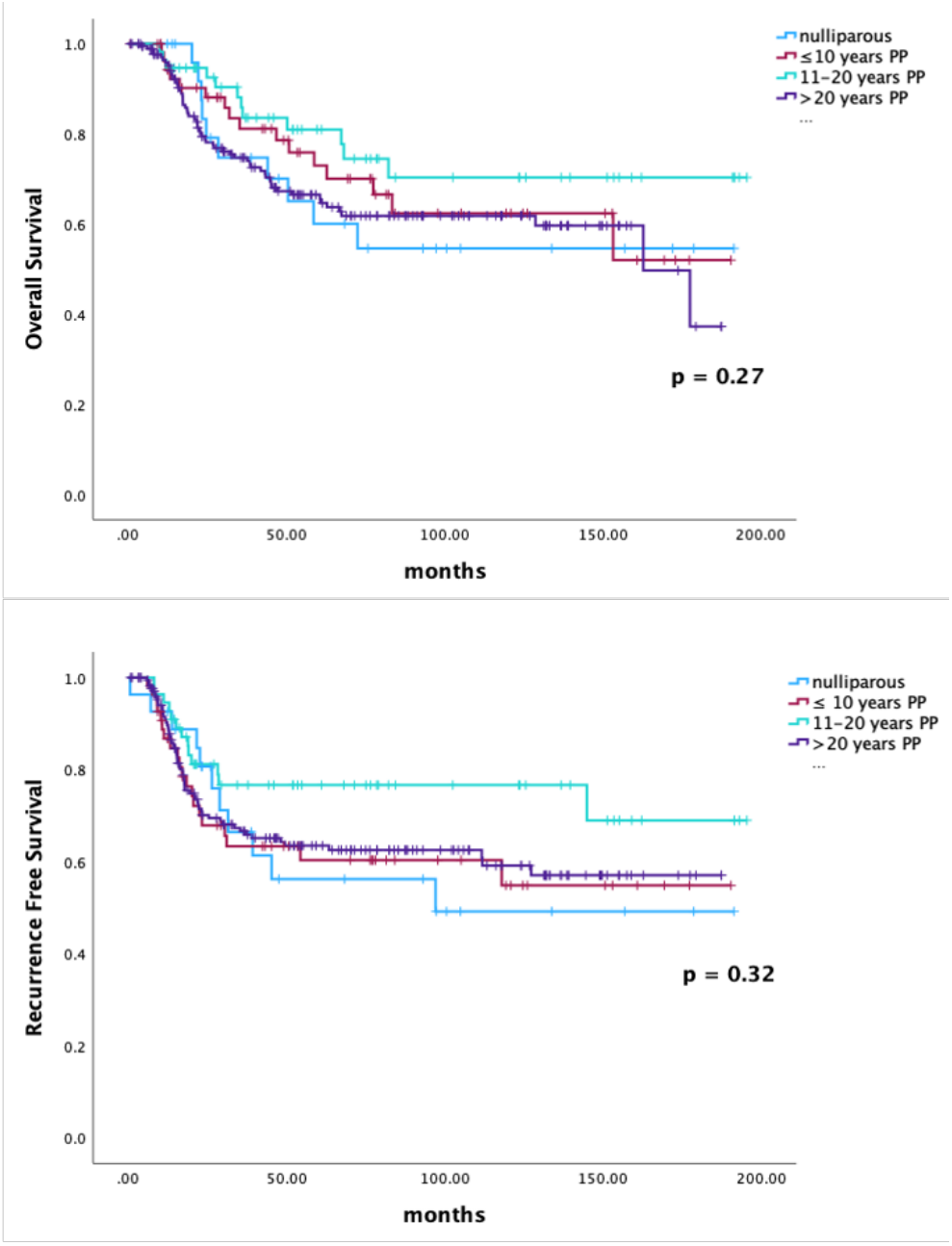
Background/Objective: Postpartum diagnosis of invasive breast cancer, defined as occurring within 5-10 years of childbirth, has been associated with poor prognosis. We sought to evaluate the impact of postpartum diagnosis on survival outcomes in patients with inflammatory breast cancer (IBC), a rare but aggressive breast cancer subtype.

Methods: This is a single-center retrospective analysis of patients in a prospectively maintained IBC database (2007-2023) with patient-completed questionnaires regarding pregnancy history. Patients with recurrent disease, stage IV disease, no survey data, and prior treatment were excluded. Chi-square and one-way ANOVA tests were used to compare differences between groups. Kaplan-Meier method and log-rank tests were performed for survival analyses. Exploratory univariate and multivariate classification and regression tree (CART) analyses were utilized for survival to identify a meaningful cutoff point in years postpartum (PP).

Results: A total of 320 patients were included, of which 27 (8.4%) were nulliparous, 56 (17.5%) ≤ 10 years PP, 56 (17.5%) between 11-20 years PP, and 181 (56.6%) > 20 years PP. The median age of diagnosis was 53 years (IQR 44-61) and patients predominantly had high grade (215, 67.2%) ductal (286, 89.4%) disease. Receptor subtypes consisted of 125 (39.1%) HR-positive/HER2-negative, 82 (25.6%) triple negative, 60 (18.8%) HR-negative/HER2-positive, and 54 (16.9%) HR-positive/HER2-positive. Majority of patients (278, 86.9%) received confirmed trimodality therapy – modified radical mastectomy (292, 91.3%), adjuvant radiotherapy (284, 88.8%), and systemic therapy (314, 98.1%). Overall pCR rate was 32.5% (104) and was highest in HR-negative/HER2-positive patients (36/57, 63.2%) and lowest in HR-positive/HER2-negative patients (24/116, 20.7%). Across the four parity groups, the ≤ 10 years PP group was significantly younger ($p = 0.003$). Groups were similar by race, ethnicity, BMI, tumor histology, grade, type of surgery received, and pCR rate. At a median follow-up of 76.6 months (95% CI: 68.0-85.1), 5-year and 10-year overall survival (OS) rates were 68% and 60%, respectively. There were no significant differences in OS and recurrence-free survival (RFS) by parity status ($p = 0.27$ and $p = 0.32$, respectively). At 5 years, nulliparous patients had the lowest OS at 60.1% while those 11-20 years PP had the highest at 81% (Figure 1). CART analyses revealed no cutoff point in PP years associated with OS or RFS. Receptor subtype significantly impacted OS and RFS ($p < 0.001$ each). Triple-negative subtype had significantly worse prognosis (median OS 59 months, 95% CI: 32-not reached [NR]) while HR-negative/HER2-positive subtype had the best prognosis (median OS 153 months, CI: 67-NR). Parity status did not impact OS and RFS within each receptor subtype.

Conclusions: In this cohort of IBC patients with a high proportion of childbearing (>90%), postpartum diagnosis did not impact OS or RFS. The aggressive nature of underlying IBC disease may override any additional risks imposed by a postpartum diagnosis. In patients with IBC, peri- or postpartum diagnosis may not necessarily portend a worse outcome compared to nulliparous cases.

Figure 1. Overall survival (top) and recurrence-free survival (bottom) in patients with inflammatory breast cancer, by parity status



1687985 - Distress at Breast Cancer Diagnosis Predicts Patient-reported Outcomes

Abigail Ludwigson[1], Laura Helmkamp[2], Monica Adams[2], Madeline Higgins[3], Erin Baurle[2], Sudheer Vemuru[3], Victoria Huynh[3], Kathryn Colborn[2], Simon Kim[3], Dan Matlock[3], Clara Lee[4], Ethan Cumbler[3], Sarah Tevis[3]

[1]University of Colorado School of Medicine, Lakewood, CO, [2]University of Colorado Anschutz Medical Center, Aurora, CO, [3]University of Colorado School of Medicine, Aurora, CO, [4]University of North Carolina School of Medicine, Chapel Hill, NC

Background/Objective: New breast cancer diagnoses can lead to heightened distress, which may impact patients' quality of life. Our study aims to evaluate how distress at diagnosis relates to patient reported outcomes (PROs) across the treatment course.

Methods: Patients with newly diagnosed breast cancer at an academic institution were offered a cancer distress screening tool measuring distress in the emotional, health, social, and practical domains. High distress in each domain was defined as a score greater than 5. Patients were invited to complete the BREAST-Q module, a validated patient reported outcome (PRO) scale which evaluates quality of life in several domains including psychosocial wellbeing (PsW) and physical wellbeing (PhW). Eligible participants had at least one distress measure at baseline and had at least one PRO at either baseline or 6 months. The study population was described with counts and percentages, for categorical variables, and medians and interquartile ranges, for continuous variables. Demographics were compared between groups using chi-squared tests or Fisher's exact tests of categorical variables and Wilcoxon-Mann-Whitney tests for continuous variables. Changes in PRO scores over time were compared between high and low distress using multivariable linear mixed models with an interaction between distress and time.

Results: The cohort included 227 patients. At baseline, a substantial proportion of patients reported high levels of distress in emotional (41%), health (31%), practical (18%), and social distress (13%). There was no significant association between high emotional, health, social, and practical distress and change in PsW from baseline to 6-months post-operatively (Table 1). While PhW scores declined over time for all groups, those with high emotional, health, and practical distress at baseline demonstrated a significantly lower decline in their PhW scores between the pre-operative and 6-month post-operative time points (Table 1). These relationships remained significant after adjusting for age, stage, and treatment received (surgery, axillary lymph node dissection, chemotherapy, radiation therapy, and endocrine therapy).

Conclusions: For patients with breast cancer, changes in wellbeing in the months after surgery was related to baseline distress at diagnosis. Future investigation should evaluate whether utilization of ancillary resources mediates the effect of high baseline distress on PRO outcomes over time.

Table 1: Relationship between baseline distress scores and PROs at pre-operative and 6-month post-operative time points

PRO (Y)	Distress scale (X)	Slope (95% CI), low distress	Slope (95% CI), high distress	p-value for interaction
Psychosocial Wellbeing (PsW)	Emotional	2.76(-1.35, 6.88)	4.82(-0.42, 10.06)	0.55
	Health	1.89(-2.05, 5.83)	7.67(1.90, 13.43)	0.11
	Social	3.23(-0.31, 6.76)	5.72(-3.18, 14.62)	0.61
	Practical	4.24(0.65, 7.83)	0.17(-7.69, 8.03)	0.36
Physical Wellbeing (PhW)	Emotional	-36.94(-43.10,-30.79)	-24.38(-32.15,-16.60)	0.01
	Health	-36.06(-41.90,-30.22)	-21.65(-30.21,-13.09)	<0.01
	Social	-32.14(-37.36,-26.93)	-30.10(-43.43,-16.77)	0.78
	Practical	-35.59(-40.85,-30.33)	-17.05(-28.44, -5.66)	<0.01

1688010 - Geographic Variation of Microbiome Among Patients with Breast Cancer

Jennifer Chen[1], Ashish Damania[1], Li Li[1], Maria Occena[1], Nancy Philip[1], Megumi Kai[1], Angela Alexander[1], Ann Klopp[1], Kelsey Kaiser[1], Danny Markabawi[2], Robert Somer[2], Generosa Grana[2], Ahmed Kamel Abou Hussein[2], Catherine Loveland Jones[2], Kahyun Yoon-Flannery[3], Upasana Joneja[4], Xinmin Zhang[2], William Klump[2], Shuyue Ren[2], Thomas Holdbrook[2], Alicia Bair[2], Thomas Buchholz[5], Sonia Ali[6], Ray Lin[5], Kiley Borchard[5], Jackie Dexter[6], Deja Eden[5], Laila Samiian[7], Dayra Avila-Lima[7], Jennifer Crozier[7], Cathryn Johnson[7], Lara Zuberi[7], Colleen Rosentraub[7], Seth Waller[7], Jillian S. Losh[1], Jennifer A. Wargo[1], Nadim J. Ajami[1], Wendy Woodward[1]

[1]The University of Texas MD Anderson Cancer Center, Houston, TX, [2]MD Anderson Cancer Center at Cooper, Camden, NJ, [3]Cooper University Hospital, Camden, NJ, [4]MD Anderson Cancer Center at Cooper, Houston, TX, [5]Scripps MD Anderson Cancer Center, San Diego, CA, [6]Scripps MD Anderson Cancer Center, La Jolla, CA, [7]Baptist MD Anderson Cancer Center, Jacksonville, FL

Background/Objective: Recent studies suggest variations in microbiome may mediate breast cancer pathogenesis and disease progression. We aimed to characterize geographic variations in skin and gut microbiome in breast cancer patients undergoing neoadjuvant systemic therapy (NST) prior to surgery.

Methods: This is a prospective multicenter study involving four comprehensive cancer centers in the U.S. Baseline breast skin and gut microbiome samples were collected from patients with invasive breast cancer prior to undergoing NST. Patients with history of malignancy in past year, inflammatory bowel disease, and antibiotic use within one week of sample collection were excluded. An additional prospective inflammatory breast cancer (IBC) patient cohort from a related study at the Houston site was included in the analysis. Breast skin and fecal microbiomes were profiled via 16S rRNA gene sequencing to derive alpha and beta diversity and taxonomic composition.

Results: A total of 134 enrolled patients had paired fecal and skin microbiome samples collected (Houston, n=53; Cooper, n=36; Baptist, n =29; Scripps, n=16). The median age was 53 years (20-83), and median body mass index (BMI) was 29 kg/m2 (17-60). Up to 50% (66) of patients had hormone receptor-positive and 68% (91) had HER2-negative disease. Tumor and nodal stages consisted of 14 (10.4%) T1, 43 (32.1%) T2, 17 (12.7%) T3, and 55 (41.0%) T4, with 34% (46) N1, 7.5% (10) N2, and 23% (31) N3. T4d patients were disproportionately enrolled at the Houston site. Within the non-IBC patients (n=81), microbial richness (alpha diversity) and community structure (beta-diversity) did not differ across geographic sites. BMI ($p = 0.008$) was a significant contributor to fecal microbiome beta-diversity, while race and age were not ($p = 0.129$ and 0.267, respectively). Additionally, there was a significant difference in skin microbiome beta diversity by BMI ($p = 0.032$) and age ($p = 0.011$), but not by race ($p = 0.237$). Among patients from the same site, no significant differences were observed in skin or stool alpha diversity by hormone and/or HER2 status. However, HER2 positivity was associated with differences in stool, but not skin, beta diversity ($p = 0.026$). Within the IBC cohort, there were significant differences in skin and stool beta diversity by HER2 status ($p = 0.049$ and 0.041, respectively). When comparing between the IBC and the non-IBC cohort, race ($p < 0.001$), BMI ($p = 0.021$), and hormone receptor status ($p = 0.03$) were significantly different. IBC diagnosis and BMI were significant contributors to skin and stool beta-diversity (skin: $p = 0.003$ and 0.002, stool: $p = 0.014$ and 0.024, respectively) after adjusting for covariates, while race and hormone receptor status were not.

Conclusions: BMI, age, HER2 status, and IBC diagnosis, but not geographic location, are associated with variations in microbiome of patients with invasive breast cancer. Correlation between microbiome diversity and treatment response, as measured by residual cancer burden, is ongoing.

Table 1: Baseline patient characteristics

Characteristic	N (%), Total N = 134
Geographic Site	
Baptist	29 (21.6%)
Cooper	36 (26.9%)
Houston	53 (39.6%)
Scripps	16 (11.9%)
Median age at enrollment	53 years (20-83 years)
Median BMI	29 kg/m^2 (17-60)
Race/Ethnicity	
African American	18 (13%)
Asian	3 (2.2%)
Caucasian	84 (63%)
Hispanic	10 (7.5%)
Other	3 (2.2%)
Unknown	16 (12%)
HR-positive	66 (50%)
HER2-positive	39 (29%)
TNM Stage	
T1	14 (10%)
T2	43 (32%)
T3	17 (13%)
T4abc	2 (1.5%)
T4d	53 (40%)
Tx	5 (3.7%)
Clinical Stage	
N0	40 (30%)
N1	46 (34%)
N2	10 (7.5%)
N3	31 (23%)
Nx	7 (5.2%)

1679543 - The Male Breast Abscess: A Review of the Pathophysiology and Microbiology

SaeRam Oh, Karinn Chambers

East Carolina University Health Medical Center, Greenville, NC

Background/Objective: Breast abscesses in men are rare and there is a paucity of literature available beyond a few case reports. The intention of this study was to review and document the pathophysiology of the male breast abscess in a retrospective review of all male patients diagnosed with a breast abscess in the East Carolina University Health Care System with the hypothesis that a history of obesity, diabetes, and smoking would be identified as risk factors in the development of this disease.

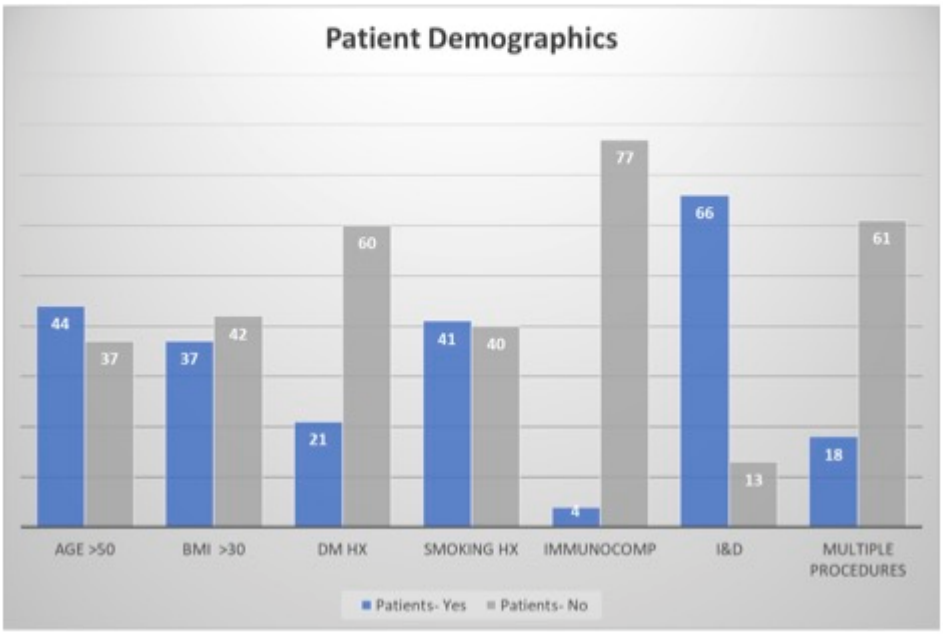
Methods: This study is a retrospective review of all documented male breast abscesses in the ECU Health Care System available through the electronic medical record over the period of 1/2019 to 1/2023. The data collected include MRN, DOB/age, zip code, insurance status, BMI, antibiotics use, whether a single or multiple procedures for drainage were performed, history of diabetes/tobacco use, immunocompromised status, and culture results.

Results: 81 male breast abscess patients were included. No correlation between the development of a male breast abscess was noted regarding obesity, smoking, or diabetes. Of these patients, 37 (45.7%) were obese with a BMI greater than 30. Diabetes was recorded in only 21 patients (26%). A smoking history was verified in 41 patients (50.6%). Not recorded were the BMIs of two patients, antibiotic treatment for three patients, procedures for two patients, and 34 of these 81 patients had no culture documented. In regards to cultures taken: Methicillin-resistant Staphylococcus Aureus was detected in 17 (21%); 10 grew staph/strep species (three listed as Methicillin-susceptible Staphylococcus Aureus); eight documented mixed skin flora, four grew Proteus mirabilis, three listed gram positive cocci; one grew Propionibacterium, Finegoldia magna, and anaerobic gram negative rods; one culture grew Prevotella and Actinomyces; one culture was positive for Corynebacterium, and one culture showed no growth. No unexpected findings in the microbiome of the male breast abscess were noted.

Conclusions: No statistically significant correlation between the risk factors thought to be associated with the development of the male breast abscess; I.e., obesity, diabetes, or smoking history was noted. In the male breast abscess patients where cultures were taken, 21 of the patients' cultures were positive for mixed staphylococcus, streptococcus, GPC and GNR. Cultures were positive for MRSA in 17 of those patients, a prevalence of 21% which is slightly higher than the estimated 19% MRSA prevalence noted in the female breast abscess. The cultures of three patients revealed a more uncommon flora. Only one culture taken revealed no growth. This is one of the first retrospective studies in the literature that focuses specifically on male breast abscess. Though no specific risk factors for the development of this disease were noted in this study nor any unexpected findings in the microbiome recorded, this study lays the foundational grounds for future investigations with the inclusion of larger databases and statistical analysis.

Table and Figure: The male breast abscess: A review of the pathophysiology and microbiology

Patient Characteristics	Number of Patients (Yes)	Number of Patients (No)
Age > 50	44	37
BMI > 30	37	42
DM Hx	21	60
Smoking Hx	41	40
Immunocompromised	4	77
Received I&D	66	13
Received Multiple procedures	18	61



1680110 - Superiority and Efficacy of a Cadaver Model vs Breast Phantom for Teaching Ultrasound-guided Breast Biopsy and Wire Localizations to Surgical Trainees

Tess Huy[1], Carlie Thompson[2], Aletta Deranteriassian[2], Warwick Peacock[2], Areti Tillou[2], Jennifer Baker[2], Danielle Graham[2], Grace Chang[2], Nimmi Kapoor[3]

[1]David Geffen School of Medicine at UCLA, Culver City, CA, [2]David Geffen School of Medicine at UCLA, Los Angeles, CA, [3]David Geffen School of Medicine at UCLA, Encino, CA

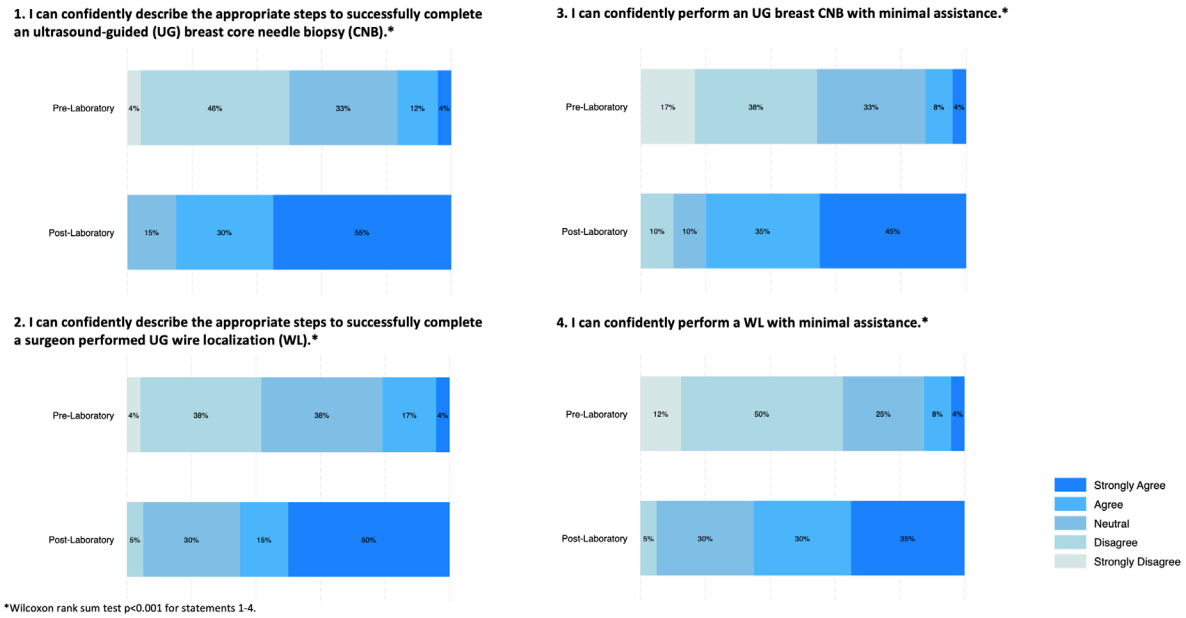
Background/Objective: Many surgical fields are embracing the use of ultrasound guidance in a variety of surgical techniques in both practice and resident education. In academic breast surgery, however, the use of ultrasound tends to be isolated to radiology departments, thus formal surgical resident training in breast ultrasound is sparse. Building on current ultrasound skills in our general surgery training program, we developed a novel curriculum to teach ultrasound-guided breast procedures (UGBPs), including both core needle biopsy (CNB) and wire localization (WL). We hypothesized that learning UGBPs on cadavers would be superior to more standard teaching with a breast phantom model using chicken breasts.

Methods: Residents received a one-hour lecture on breast CNB and WL followed by a one-hour hands-on session. Olives stuffed with red pimentos were used to replicate breast masses and were implanted in chicken breasts (phantom) and in the breasts of lightly embalmed female cadavers (cadaver). All residents practiced UGBP with a course instructor in both models with an average of 6 minutes per model. Anonymous pre- and post-laboratory surveys utilizing a 5-point Likert scale were completed by residents and analyzed using a two-sample t-test, Wilcoxon rank sum test, and ordered logit. This study was certify exempt by our IRB.

Results: Twenty-four trainees participated in the didactic session and completed the pre-course survey and 20 of these residents completed the post-course survey after the laboratory session. Participating trainees were from post graduate clinical year 2 to 6 (mean 3.5). Most trainees (n=21, 87.5%) had previous faculty-led ultrasound teaching and had independently performed 6 or more ultrasound-guided procedures including central line placement or chest pigtail placement (n=20, 83.3%). 67% (16/24) of residents had never performed UGBP. All 20 residents who completed the laboratory session successfully performed CNB and captured the red pimento from the center of the target. 73.7% (14/19) of trainees successfully performed a WL within the time allotted (one did not attempt a WL). 85% preferred learning UGBP on cadavers over phantoms citing that the cadaver was more realistic. 95% of trainees who participated in both didactic and laboratory sessions rated the course as excellent (n=15) or good (n=4), and most (75%, 15/20) thought the course prepared them for real-life procedures. More time in the laboratory session was the most common area for improvement proposed by participants. Following the course, residents' confidence in describing and performing CNBs and WLs on pre- and post-laboratory surveys increased significantly, even when controlling for clinical year ($p< 0.001$, see Figure).

Conclusions: Following a novel two-hour UGBP training curriculum using phantom and cadaveric models, all surgical trainees were able to successfully perform a CNB and most were able to perform a WL. Participant confidence in describing and performing UGBPs significantly improved after the course, while most felt that the cadaveric model was superior. Further studies are needed to investigate transferability of these skills to clinical practice.

Figure 1. Pre- and post-laboratory ultrasound guided breast procedure statement responses



*Wilcoxon rank sum test p<0.001 for statements 1-4.

1681645 - National Trends in Breast Operative Case Volumes for Graduating Chief Residents in General Surgery

Diane Ellis[1], Beatriz Ibanez Moreno[2], Andrew Jones[2], Brenessa Lindeman[1], Herbert Chen[1], Helen Krontiras[1], Rachael Lancaster[1], Catherine Parker[1], Polina Zmijewski[1]

[1]University of Alabama at Birmingham, Birmingham, AL, [2]The American Board of Surgery, Philadelphia, PA

Background/Objective: To understand factors influencing the number of breast surgery cases performed by general surgery residents from 2018-2022.

Methods: We partnered with the American Board of Surgery to examine national data from all accredited programs. A retrospective analysis of operative case logs submitted from 2018-2022 was performed. Case logs were reviewed for the total number of breast procedures performed by general surgery residents, then stratified by program type and resident gender. Factorial ANOVA was used to determine statistical significance and ω ^2 and Cohen's D were used for effect size estimation.

Results: Operative logs from 353 ACGME accredited programs were analyzed. Programs were categorized as academic (32%), community-based (20.7%), hybrid (44%), and military (2.8%). Mean number of cases of all types performed by female residents at all institutions was 1489.9 vs. 1527.69 for males ($p< 0.001$, $d= -0.151$). Female residents performed more breast surgery cases overall with an average of 71.12, compared to male residents with an average of 65.41 ($p< 0.000$, ω ^2 0.011). Females at military programs performed 90.07 breast cases, vs 81.43 by males. Female residents at community programs performed 81.23 breast cases vs. 66.24 in males. Females at hybrid programs performed 74.58 of cases vs. 67.31 by males. Female residents at academic programs performed 66.22 cases vs. 62.85 by Males ($p < 0.001$, ω ^2 0.071) with an average of 38 fewer cases performed by females. The largest disparity observed was at community programs and was 15.23 cases.

Conclusions: While residents who identify as male record higher case numbers overall at the end of general surgery training, this trend is reversed in breast surgery. Residents who identify as female performed more breast surgery cases overall compared to male residents. The most breast cases were performed by residents at military programs, followed by community programs, with the greatest difference between male and female residents observed at community programs. It is important to note that though p values are significant, effect size is small or negligible. The educational benefit and root cause of these disparities do represent a national trend that deserves consideration.

1682444 - Initial Telemedicine Consultations for Screen Detected Noncancerous Findings Is Feasible and Provides Excellent Patient Satisfaction Outcomes

Erin Bayley[1], Michael Cowher[2], Priscilla McAuliffe[2], Qurat Ul Ain Sabih[2], Atilla Soran[3], Jennifer Steiman[2], Kristin Lupinacci[2], Emilia Diego[4]

[1]UPMC, Sewickley, PA, [2]UPMC, Pittsburgh, PA, [3]UPMC Magee Women's Hospital, Pittsburg, PA, [4]University of Pittsburgh, Pennsylvania, Pittsburgh, PA

Background/Objective: In the wake of the COVID-19 pandemic, there has been increasing utilization of telehealth platforms for initial consultations and follow-up visits across a variety of disciplines. While this is intended to improve accessibility to care, this remains uncharacterized in a breast surgical patient population. Furthermore, patient satisfaction and comfort with breast surgery telemedicine consultations (TMC) has not been described. The objective of this study is to determine patient satisfaction after completing a TMC with a breast surgeon for a screen-detected, non-cancer imaging finding.

Methods: Patients referred to an academic breast practice from February-October 2023 for a screen-detected, non-cancerous abnormality were eligible. Those with significant family history or breast complaints were excluded. Schedules for the benign clinics were screened. Eligible patients were invited to convert to TMC. Patients who agreed and completed a TMC were electronically sent a validated Telehealth Usability Questionnaire (TUQ) with additional questions to evaluate travel time and cost savings, and ability for a companion to attend the visit. Question responses were graded on a 7-point Likert scale, with 1 for “strongly disagree” and 7 for “strongly agree.” Mean scores and standard deviations were reported.

Results: 29 patients were eligible for conversion of in-person visit to TMC. Of these, 23 opted for TMC, and 20 TUQ surveys were completed (response rate 87%). The mean age of all patients who completed a TMC was 56±13 years. Table 1 shows questions from the TUQ. The mean score for 19/21 questions was >6. Average score to responses about whether the TMC feels “the same as in-person visits,” was 5.9±1.5. In terms of “overall satisfaction” with the TMC, the mean score was 6.6±0.9. With respect to time and cost savings, 55% (11/20) reported they would have traveled < 25 miles for an in-person consultation. However, 15% (3/20) and 10% (2/20) of respondents reported they would have otherwise travelled 50-100 miles or >100 miles, respectively. The majority of patients (75%) reported an associated travel cost savings of <$20, though the anticipated travel cost of an in-person visit was greater than $50 for 15% (3/20) of patients. Regarding companions during the visit, 45% (9/20) reported that more family members were able to attend because of the virtual nature of the TMC. Regarding the timing of the visit, patients were able to be seen, on average, 4 days sooner due to TMC accessibility, with most (17/23, 74% patients being seen on the same day as originally scheduled). Regarding surgical findings, no concerning physical exam findings were noted upon first in-person meeting the morning of surgery.

Conclusions: Breast TMC is feasible and satisfactory to patients. Such visits provide modest time and cost savings for most patients, but few patients avoided significant financial and travel burdens. These results may be due to the limited catchment area of the patient referral base and selection bias, but suggest that TMC is a feasible and satisfactory, especially in locations where specialist care is limited. Future directions should aim to assess if TMC is acceptable for screen detected, early-stage breast cancers.

Table 1: Telehealth questionnaire and mean responses (7-point scale)

Question	Mean Score	SD
Telehealth improves my access to healthcare services.	6.4	1.3
Telehealth saves me time traveling to a hospital or specialist clinic.	6.8	0.5
Telehealth provides for my healthcare need.	6.7	0.7
It was simple to use the telehealth system.	6.8	0.7
It was easy to learn to use the telehealth system.	6.8	0.7
I believe I could become productive quickly using this telehealth system.	6.7	0.8
The way I interact with this telehealth system is pleasant.	6.8	0.7
I like using the telehealth system.	6.5	1.1
The telehealth system is simple and easy to understand.	6.8	0.7
This telehealth system is able to do everything I would want it to be able to do.	6.2	1.2
I can easily talk to the clinician using the telehealth system.	6.7	0.7
I can hear the clinician clearly using the telehealth system.	6.6	0.7
I felt I was able to express myself effectively.	6.6	0.8
Using the telehealth system, I can see the clinician as well as if we met in person.	6.7	0.7
I think the visits provided over the telehealth system are the same as in-person visits.	5.9	1.5
Whenever I made a mistake using the telehealth system, I could recover easily and quickly.	6.4	1.0
The telehealth system gave error messages that clearly told me how to fix problems.	5.6	1.7
I feel comfortable communicating with the clinician using the telehealth system.	6.6	0.8
Telehealth is an acceptable way to receive healthcare services.	6.5	0.8
I would use telehealth services again.	6.7	0.8
Overall, I am satisfied with this telehealth system.	6.6	0.9

1688449 - The Breast Surgery Whiteboard Time Out: A Tool to Enhance Trainee Autonomy in Breast Surgical Oncology

Alexa Griffiths[1], Yeonjoo Cho[1], Michelle Zhu[2], Ashley Anderson[1], Mukuhi Nganga[1], Charusheela Andaz[1], Donna Marie Manasseh[1], Patrick Borgen[1], Joshua Feinberg[1]

[1]Maimonides Medical Center, Brooklyn, NY, [2]SUNY Downstate College of Medicine, Brooklyn, NY

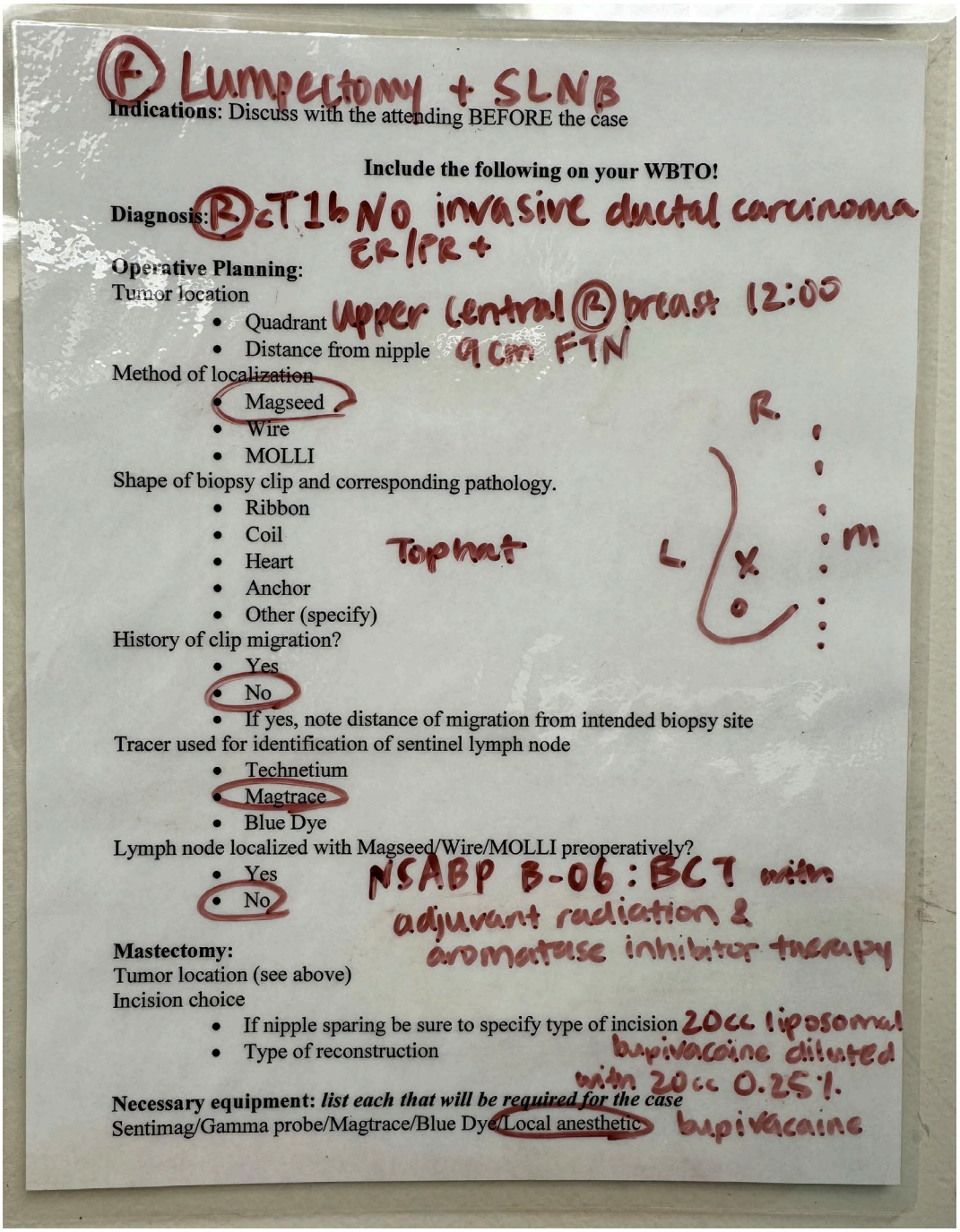
Background/Objective: The "Whiteboard Time Out" (WBTO) is a tool developed to target the gaps in operative surgical education with a focus on creating a more resident centered learning environment. The original creation of the WBTO for general surgery demonstrated that residents found the WBTO to be a useful educational tool.1 Our current study focuses on the development of the breast surgery WBTO (B-WBTO) to enhance resident learning in breast surgical oncology. This is a pilot study that aims to evaluate the feasibility and effectiveness of the B-WBTO through measurement of resident satisfaction, level of autonomy, and preparedness for breast specific surgical cases.

Methods: Participants included general surgery residents at an ACGME accredited general surgery residency program. Breast surgery procedures included excisional biopsy, lumpectomy, sentinel lymph node biopsy, axillary lymph node dissection, and mastectomy with or without reconstruction. Prior to scrubbing, residents were expected to outline the breast specific details of the procedure on a whiteboard mounted in an accessible area within the OR (Figure 1). Residents were encouraged to research specific trials pertinent to the case to further enhance their understanding of the patient's specific disease and management options. Prior to the start of the procedure, the resident and attending reviewed the whiteboard together, verbally discussing the patient's history, diagnosis, and surgical plan. Post-procedure, residents uploaded a picture of the WBTO to a cloud platform, allowing resident self-evaluation and attending feedback. Following a 4-week pilot period, residents completed a previously validated survey questionnaire, aimed at evaluating the educational quality of the B-WBTO.

Results: A total of 11 general surgery residents completed the questionnaire. Participation was highest amongst junior residents. The implementation of the B-WBTO has a positive impact on pre-operative preparation, intra-operative teaching, attending teaching, and breast cancer management as demonstrated by a median score, "agree", on all of the breast specific questions included on the 5-point Likert scale survey. On average, residents "agree" that the B-WBTO enhances teaching, an improvement from a "neutral" score following implementation of the original general surgery WBTO at the same institution.

Conclusions: The B-WBTO addresses the nuances of breast surgery which were not adequately captured in the prior WBTO format. Although our sample size is small, this pilot study demonstrates the effectiveness of the B-WBTO to guide preoperative preparation, intraoperative teaching, and development of a management plan specific to a patient undergoing breast surgery. The B-WBTO will be a valuable tool to improve resident preparedness and autonomy as assessed by the recently launched American Board of Surgery Entrustable Professional Activities (EPA) Project.

Figure 1: B-WBTO



(R) Lumpectomy + SLNB

Indications: Discuss with the attending BEFORE the case

Include the following on your WBTO!

Diagnosis: (R) cT1b N0 invasive ductal carcinoma ER/PR+

Operative Planning:

Tumor location

- Quadrant Upper central (R) breast 12:00
- Distance from nipple 9 cm FTN

Method of localization

- Magseed
- Wire
- MOLLI

Shape of biopsy clip and corresponding pathology.

- Ribbon
- Coil
- Heart
- Anchor
- Other (specify) Tophat

R. L. X O m

History of clip migration?

- Yes
- No
- If yes, note distance of migration from intended biopsy site

Tracer used for identification of sentinel lymph node

- Technetium
- Magtrace
- Blue Dye

Lymph node localized with Magseed/Wire/MOLLI preoperatively?

- Yes
- No

NSABP B-06: BCT with adjuvant radiation & aromatase inhibitor therapy

Mastectomy:

Tumor location (see above)

Incision choice

- If nipple sparing be sure to specify type of incision 20cc liposomal bupivacaine diluted with 20cc 0.25% bupivacaine
- Type of reconstruction

Necessary equipment: ***list each that will be required for the case***

Sentimag/Gamma probe/Magtrace/Blue Dye/Local anesthetic

1684851 - The Synergistic Effect of Combined Physical Therapy and Supervised, Individualized Exercise on Patients Receiving Treatment for Breast Cancer

Karen Wonders[1], Kathryn Schmitz[2], Jay Harness[3]

[1]Maple Tree Cancer Alliance, Cedarville, OH, [2]University of Pittsburgh Medical Center, Pittsburgh, PA, [3]Maple Tree Cancer Alliance, Queen Creek, AZ

Background/Objective: There is strong evidence to support the management of physical impairments through a comprehensive oncology rehabilitation program, involving a collaborative team of physical therapists and exercise physiologists. This is reflected in new NAPBC standards, which require newly diagnosed breast cancer patients be referred to an exercise program, undergo a functional assessment, and for documentation and implementation of that exercise therapy in the patient's medical record (Standards 5.7, 5.9, 5.11, and 5.15). Once triaged, oncology-trained physical therapists and exercise oncology physiologists can meet the comprehensive goals set by NABPC by using a whole person approach to cancer care. However, the infrastructure of such pathways has yet to be articulated in an oncology setting. As such, the purpose of this study was to examine the effectiveness, adherence, attendance, and feasibility of various patient pathways in an exercise program offered to breast cancer patients.

Methods: Following consent, pre-participation medical clearance, breast cancer patients (n=218) completed the EXCEEDS triage tool, which made recommendations into the patient pathways of physical therapy directed cancer rehabilitation (n= 118) or physiologist supervised exercise (n=100). Of the patients in the cancer rehabilitation pathway, 38 completed exercise therapy in parallel with physical therapy, and 80 completed physical therapy first, followed by 12-weeks of exercise therapy. At the completion of each study arm, the patient completed the fitness assessment again, and participation and adherence rates were documented.

Results: The intervention took place during the length of the person's chemotherapy treatment, with the average 16+ weeks. The intervention was two sessions per week for the PT+EX group, and attendance was 88%. For the EX-only group, the intervention was one session per week, and attendance was 84%. Aerobic fitness was significantly improved from baseline in both groups, but between group differences revealed this improvement was to a greater degree in PT+EX group (+3.2 mL/kg/min, compared to 2.6 mL/kg/min for EX-only). In the PT+EX group, there was a statistically significant increase in muscular strength as compared to the EX-only group (+5.4 kg vs. 3.7 kg, respectively). There were also positive changes in fatigue, depression, and anxiety within both groups, but not between the groups.

Conclusions: This study demonstrates the combined efficacy and feasibility on functional level, and individual goals all help determine the safest and most effective service pathway for the patient. This study will expedite the implementation of cancer rehabilitation and exercise services in oncology, thereby helping to make high quality, evidenced-based exercise programs available to patients on a broad scale.

1688284 - Long-term Survival Outcomes of Invasive Lobular Carcinoma Compared with Invasive Ductal and Mixed Invasive Ductal-Lobular Carcinoma: A SEER Analysis

Simran Sandhu[1], Vasily Giannakeas[2], David Lim[3]

[1]NUI Galway, Galway, Ireland, [2]Women's College Research Institute, Toronto, ON, Canada, [3]Women's College Hospital, Toronto, ON, Canada

Background/Objective: Invasive lobular carcinoma (ILC) is a distinct subtype of breast cancer but is treated exactly the same as invasive ductal carcinoma (IDC). We aimed to characterize differences in survival between ILC, IDC and mixed invasive ductal-lobular carcinoma (IDLC). We further contrasted predictors of survival between the three subtypes.

Methods: Using the SEER database, we performed a retrospective cohort study of women diagnosed with ILC, ILC and IDLC between 1998 and 2019. We collected demographic data on race, age at diagnosis, year of diagnosis, marital status, and income. Clinical data included cancer grade, size, laterality, clinical stage, T and N stage, ER/PR/HER2 receptor status, surgery type, chemotherapy, radiation, and cause of death. Differences between subtypes were assessed using chi-square tests or one-way ANOVA. Breast cancer-specific survival (BCSS) was compared between the cancer sub-type groups using the Kaplan-Meier method. To identify predictors of survival, Cox-proportional hazard models were constructed. Statistical analyses were performed using SAS® and P values < 0.05 were considered significant.

Results: 431,096 women with breast cancer were identified as follows: 362,641 IDC, 38,769 ILC, and 29,686 IDLC. The 5-year BCSS was worse in women with IDC, as rates for IDC, ILC and IDLC were 92.5%, 94.1%, and 94.4%, respectively (P = 0.003). However, the 10-year BCSS was worse in women with ILC, as rates for IDC, ILC and IDLC were 88.2%,87.3%, and 88.5%, respectively (P= 0.003). This persists at twenty years where BCSS rates for IDC, ILC and IDLC were 82.6%, 78.2%, and 80.8%, respectively (P = 0.003). Predictors of worse survival for all subtypes include Black race (HR1.30, P=< 0.0001), age < 30 years (HR1.16, P=0.0038) and > 70 (HR 1.4, P < .01), and ER-/PR- status (HR1.62, P= < 0.0001) (Table 1). Asian race had better survival for IDC but not ILC. Not surprisingly, the hazard ratio increases with increasing cancer grade, size, and nodal burden. Patients who had unilateral mastectomy had worse BCSS than patients having lumpectomy for IDC, but not ILC (Table 1). Bilateral mastectomy did not improve BCSS for any subtype. Radiation receipt was associated with improved survival across all types of breast cancer (HR0.813, P=< 0.0001). Receiving chemotherapy did not affect survival, across all types (HR1.000, P=0.9985).

Conclusions: Women with ILC have worse survival compared with IDC and IDLC at 10 and 20 years after diagnosis. The predictors of survival were similar across all subtypes. Using standard factors captured in SEER, we could not identify any unique factors that portend the worse survival for ILC. Further studies are required to better understand the worse survival among patients with lobular breast cancer, particularly looking beyond standard clinico-pathologic measures captured in epidemiologic databases such as tumour biology, recurrence patterns, socioeconomic disparities, and treatment adherence.

Table 1: Cox Proportional Hazard Models

Variables	Lobular		Ductal		Mixed		All	
	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value
Age								
10-19	1.00		1.00		1.00		1.00	
<30	3.010 (1.493 – 6.069)	0.00021	1.126 (1.017 – 1.248)	0.0228	1.781(1.374 – 2.704)	0.0067	1.356 (1.048 – 1.279)	0.0038
30-39	1.352 (0.932 – 1.423)	0.1911	1.121 (1.076 – 1.169)	<0.0001	1.416(1.215 – 1.645)	<0.0001	1.130 (1.087 – 1.173)	<0.0001
40-49	0.971 (0.873 – 1.080)	0.5873	0.964 (0.934 – 0.996)	0.0273	1.073(0.968 – 1.189)	0.1782	0.970 (0.942 – 0.999)	0.0406
50-69	1.076 (0.976 – 1.183)	1.348	1.067 (1.032 – 1.102)	0.0001	1.125(1.015 – 1.246)	0.0245	1.072 (1.041 – 1.104)	<0.0001
70-79	1.511 (1.363 – 1.679)	<0.0001	1.414 (1.382 – 1.447)	<0.0001	1.504 (1.334 – 1.654)	<0.0001	1.445 (1.398 – 1.458)	<0.0001
80+	2.545 (2.248 – 2.883)	<0.0001	2.505 (2.402 – 2.612)	<0.0001	2.503 (2.147 – 2.914)	<0.0001	2.514 (2.418 – 2.613)	<0.0001
Unknown	3.477(0.487 – 24.828)	0.2141	7.282 (5.671 – 9.349)	<0.0001	0.000 (0.000 – 1.21518)	0.9664	7.371 (5.754 – 9.442)	<0.0001
Race								
White	1.00		1.00		1.00			
Asian	0.579 (0.844 – 1.139)	0.7750	0.857 (0.825 – 0.858)	<0.0001	0.867 (0.747 – 1.006)	0.0593	0.866 (0.836 – 0.858)	<0.0001
Black	1.324 (1.170 – 1.478)	<0.0001	1.297 (1.256 0 1.338)	<0.0001	1.278 (1.122 – 1.454)	0.0002	1.298 (1.260 – 1.337)	<0.0001
Other/ Unknown	1.025 (0.837 – 1.254)	0.8140	0.829 (0.782 – 0.880)	<0.0001	0.900 (0.706 – 1.146)	0.3926	0.845 (0.800 – 0.893)	<0.0001
Ethnicity								
Non-Hispanic	1.00		1.00		1.00		1.00	
Hispanic	1.085 (0.974 – 1.209)	0.1402	0.585 (0.954 – 1.017)	0.3551	1.089 (0.960 – 1.210)	0.3148	1.000 (0.971 – 1.030)	0.9886
Marriage Status								
Married	1.00		1.00		1.00		1.00	
Divorced	1.210 (1.090 – 1.342)	0.0003	1.172 (1.133 – 1.213)	<0.0001	1.085 (0.970 – 1.213)	0.1540	1.168 (1.133 – 1.209)	<0.0001
Never Married	1.279 (1.158 – 1.414)	<0.0001	1.187 (1.152 – 1.223)	<0.0001	1.100 (0.993 – 1.219)	0.0676	1.187 (1.155 – 1.223)	<0.0001
Widowed	1.301 (1.183 – 1.430)	<0.0001	1.266 (1.224 – 1.309)	<0.0001	1.103 (0.981 – 1.239)	0.1011	1.258 (1.220 – 1.297)	<0.0001
Unknown	1.107 (0.948 – 1.293)	0.1970	1.028 (0.976 – 1.082)	0.2764	1.154 (0.964 – 1.381)	0.1187	1.037 (0.991 – 1.085)	0.1211
Income Status								
45,000-49,999	1.00		1.00		1.00		1.00	
<35,000	2.673 (1.572 – 4.529)	0.0003	1.205 (1.005 – 1.443)	0.0398	0.636 (0.198 – 2.040)	0.4464	1.270 (1.076 – 1.500)	0.0048
35,000 - 39,999	0.590 (0.294 – 1.184)	0.1376	1.146 (0.968 – 1.355)	0.1126	1.114 (0.528 – 2.353)	0.7765	1.115 (0.950 – 1.307)	0.1823
40,000 - 44,999	1.093 (0.750 – 1.593)	0.6434	1.046 (0.937 – 1.168)	0.4213	1.087 (0.685 – 1.727)	0.7226	1.054 (0.951 – 1.169)	0.3154
50,000 - 54,999	0.967 (0.743 – 1.311)	0.7282	0.951 (0.872 – 1.037)	0.2125	0.943 (0.662 – 1.343)	0.7450	0.956 (0.882 – 1.038)	0.2853
55,000 - 59,999	1.067 (0.820 – 1.389)	0.6251	0.915 (0.843 – 0.994)	0.0314	0.956 (0.691 – 1.323)	0.7858	0.932 (0.863 – 1.006)	0.0653
60,000 - 64,999	0.942 (0.743 – 1.197)	0.6251	0.894 (0.833 – 0.960)	0.0024	0.982 (0.741 – 1.302)	0.8996	0.909 (0.850 – 0.972)	0.0053
65,000 - 69,999	1.042 (0.815 – 1.332)	0.7422	0.912 (0.846 – 0.983)	0.0156	0.940 (0.702 – 1.258)	0.6760	0.925 (0.863 – 0.991)	0.0275
70,000 - 74,999	0.921 (0.716 – 1.183)	0.5184	0.920 (0.852 – 0.993)	0.0321	0.992 (0.735 – 1.332)	0.9572	0.926 (0.863 – 0.994)	0.0342
> 75,000	0.871 (0.687 – 1.103)	0.2508	0.845 (0.790 – 0.912)	<0.0001	0.849 (0.640 – 1.127)	0.2571	0.852 (0.797 – 0.910)	<0.0001
Unknown	1.083 (0.494 – 2.372)	0.8419	1.205 (0.751 – 1.482)	0.0398	0.410 (0.098 – 1.704)	0.2197	0.987 (0.728 – 1.337)	0.9305
Cancer Grade								
Grade 1	1.00		1.00		1.00		1.00	
Grade 2	1.213 (1.108 – 1.329)	<0.0001	1.540 (1.848 – 2.017)	<0.0001	1.472 (1.296 – 1.672)	<0.0001	1.733 (1.664 – 1.804)	<0.0001
Grade 3	1.593 (1.423 – 1.783)	<0.0001	2.839 (2.704 – 2.982)	<0.0001	2.110 (1.844 – 2.414)	<0.0001	2.507 (2.406 – 2.612)	<0.0001
Unknown	1.210 (1.087 – 1.348)	0.0005	2.196 (2.069 – 2.332)	<0.0001	1.617 (1.333 – 1.963)	<0.0001	1.941 (1.847 – 2.040)	<0.0001
Cancer Size								
1 – 1.9 cm	1.00		1.00		1.00		1.00	
<1cm	0.677 (0.562 – 0.814)	<0.0001	0.587 (0.557 – 0.619)	<0.0001	0.540 (0.442 – 0.660)	<0.0001	0.587 (0.555 – 0.617)	<0.0001
2 – 2.9 cm	1.448 (1.253 – 1.623)	<0.0001	1.586 (1.535 – 1.639)	<0.0001	1.624 (1.462 – 1.803)	<0.0001	1.584 (1.537 – 1.632)	<0.0001
3 – 4.9 cm	1.952 (1.747 – 2.180)	<0.0001	2.007 (1.940 – 2.076)	<0.0001	2.014 (1.803 – 2.250)	<0.0001	2.015 (1.953 – 2.079)	<0.0001
5 – 9.9 cm	2.375 (1.938 – 2.442)	<0.0001	2.608 (2.508 – 2.713)	<0.0001	2.718 (2.406 – 3.071)	<0.0001	2.593 (2.501 – 2.684)	<0.0001
>10 cm	2.729 (2.252 – 3.250)	<0.0001	3.523 (3.288 – 3.778)	<0.0001	3.186 (2.557 – 3.968)	<0.0001	3.416 (3.212 – 3.632)	<0.0001
Unknown	1.424 (1.192 – 1.702)	0.0001	1.442 (1.371 – 1.517)	<0.0001	1.464 (1.201 – 1.785)	0.0002	1.450 (1.384 – 1.519)	<0.0001
N Status								
N0	1.00		1.00		1.00		1.00	
N1	2.083 (1.896 – 2.289)	<0.0001	1.950 (1.896 – 2.006)	<0.0001	2.142 (1.944 – 2.361)	<0.0001	1.577 (1.926 – 2.029)	<0.0001
N2	4.254 (3.811 – 4.748)	<0.0001	3.401 (3.280 – 3.526)	<0.0001	3.999 (3.516 – 4.496)	<0.0001	3.518 (3.404 – 3.636)	<0.0001
N3	7.922 (7.114 – 8.821)	<0.0001	5.371 (4.968 – 5.382)	<0.0001	6.462 (5.716 – 7.308)	<0.0001	5.533 (5.340 – 5.732)	<0.0001
Unknown	2.240 (1.898 – 2.642)	<0.0001	2.372 (2.264 – 2.485)	<0.0001	2.506 (2.344 – 3.143)	<0.0001	2.399 (2.297 – 2.509)	<0.0001
Not Available	3.949 (1.464 – 10.654)	0.0067	4.715 (3.928 – 5.663)	<0.0001	11.016 (4.262 – 29.329)	<0.0001	4.985 (4.178 – 5.947)	<0.0001
ER/PR Status								
ER-/PR-	1.00		1.00		1.00		1.00	
ER-/PR+	1.520(1.398 – 1.653)	<0.0001	1.342 (1.297 – 1.389)	<0.0001	1.401 (1.261 – 1.558)	<0.0001	1.364 (1.323 – 1.406)	<0.0001
ER-/PR+	1.464(1.051 – 2.087)	0.0240	1.576 (1.460 – 1.700)	<0.0001	1.612 (1.167 – 2.227)	0.0038	1.572 (1.462 – 1.691)	<0.0001
ER-/PR-	2.176(1.903-2.488)	<0.0001	1.600 (1.557 – 1.644)	<0.0001	2.187 (1.942 – 2.463)	<0.0001	1.620 (1.579 – 1.662)	<0.0001
NA	1.527(1.005-1.263)	0.0400	1.431 (1.381 – 1.483)	<0.0001	1.097 (0.976 – 1.233)	0.1221	1.384 (1.341 – 1.430)	<0.0001
Cancer Surgery								
Lumpectomy	1.00		1.00		1.00		1.00	
Unilateral mastectomy	1.070(0.982 – 1.172)	0.1217	1.115 (1.085 – 1.146)	<0.0001	1.037 (0.931 – 1.111)	0.7079	1.108 (1.081 – 1.136)	<0.0001
Bilateral Mastectomy	0.985(0.856 – 1.134)	0.8331	0.984 (0.933 – 1.037)	0.5450	1.077 (0.927 – 1.251)	0.3345	1.006 (0.960 – 1.054)	0.8106
No surgery	4.392(3.663 – 4.759)	<0.0001	3.183 (3.060 – 3.311)	<0.0001	3.434 (2.894 – 4.074)	<0.0001	3.274 (3.156 – 3.396)	<0.0001
Unknown	2.852(1.943 (3.618)	<0.0001	2.765 (2.544 – 3.005)	<0.0001	2.150 (1.522 – 3.153)	<0.0001	2.766 (2.557 – 2.993)	<0.0001
Chemotherapy								
No	1.00		1.00		1.00		1.00	
Yes	1.087 (1.000-1.183)	0.0504	0.982 (0.956 – 1.009)	0.2015	1.004 (0.918 – 1.098)	0.9271	1.000 (0.976 – 1.025)	0.9985
Radiation								
No	1.00		1.00		1.00		1.00	
Unknown	0.728(0.576 – 0.920)	0.0079	0.800 (0.748 – 0.854)	<0.0001	0.785 (0.632 – 0.974)	0.0280	0.791 (0.744 – 0.843)	<0.0001
Yes	0.821(0.762 – 0.885)	<0.0001	0.810 (0.790 – 0.831)	<0.0001	0.842 (0.777 – 0.913)	<0.0001	0.813 (0.794 – 0.832)	<0.0001

1688293 - Not "Just" a Lumpectomy: Creation of a Teaching Module for Residents and Fellows to Enhance Autonomy

Jennifer Steiman[1], Mary Klingensmith[2]

[1]Breast Surgical Oncology at UPMC, Pittsburgh, PA, [2]ACGME, Chicago, IL

Background/Objective: Learning how to perform a lumpectomy for breast cancer independently can be challenging for residents and Fellows. It is often hard to convert 2D images from a mammogram/ultrasound into a 3D specimen. The operation commonly lacks specific anatomic landmarks. Lastly, preparation for its creation sometimes occurs immediately pre-operatively when localization is needed, allowing for less planning time. We created a comprehensive learning module using a video, in-person presentation, itemized worksheet and modeling clay to increase a trainee's ability to perform the operation with minimal guidance.

Methods: 38 residents and oncology Fellows attended a 1 hour in-person structured teaching session. A 15-minute instructional video (Step 1) was created and distributed via email prior to the workshop for review. Concepts from the video were discussed in a short in-person refresher (Step 2) before applying the techniques to 3 patient cases. Pre-operative imaging was analyzed, and modeling clay plus a ruler was provided. Using these tools, trainees were asked to complete a worksheet (Step 3) to decide incision placement and length, skin flap thickness, specimen size and clip/localizer accommodations. Trainees were encouraged to then create a model of the specimen with clay (Step 4). Pre- and post-session surveys were completed by participants electronically.

Results: 79% of trainees (30/38) reported never receiving formal training on a lumpectomy. 7 Fellows and 8 senior residents (PGY 3-5) were included (50%), all who had rotated on a breast surgical service before. When rating difficulty, 26% (10/38) found this case to be difficult or very difficult, 7 being a Fellow or senior resident with prior experience. No trainees reported supervision-only autonomy. Regarding confidence (see Table 1), only Fellows expressed being extremely confident prior to the session (n=2). Residents did not report this high level of confidence before or after the session. Junior residents (PGY 1-2) had the most growth, with increasing confidence levels post session. Of the 4 steps of the program, the in-person case review was highly rated as extremely useful (14/23) in 61% of participants. The modeling clay was helpful (moderately, very and extremely) in 19 trainees (83%), though only 5 found it "very effective" to develop the 3D specimen. Worksheet completion was the most useful module tools, for all trainees recorded a score of moderately (n=4), very (n= 10) or extremely (n=9) useful.

Conclusions: Our data demonstrates a potential need for more formalized training for both residents and Fellows regarding a lumpectomy. As the desire for competency-based education continues to grow, we may need to adopt a standard teaching program with at-home learning, in-person instruction and hands-on modeling to ensure autonomy at graduation.

Table 1: Levels of trainee confidence regarding performing a lumpectomy independently pre- and post-teaching session

	Junior Resident Pre-Survey (n=13)	Junior Resident Post Survey (n=8)		Senior Resident Pre-Survey (n=16)	Senior Resident Post Survey (n=6)		Oncology Fellow Pre-Survey (n=9)	Oncology Fellow Post-Survey (n=9)
Extremely Confident	0	0		0	0		2	2
Quite Confident	0	1		1	1		1	6
Somewhat Confident	0	2		3	4		6	1
Slightly Confident	2	3		7	1		0	0
Not Confident	11	2		5	0		0	0

1688389 - Using the RE-AIM Framework to Evaluate a Clinical Exercise Oncology Program Offered to Patients Being Treated for Breast Cancer

Karen Wonders[1], Kathryn Schmitz[2], Jay Harness[3], Divya Rao[4], Sharon Rosenbaum Smith[5], Janet Yeh[5], Paul Baron[5]

[1]Maple Tree Cancer Alliance, Cedarville, OH, [2]University of Pittsburgh Medical Center, Pittsburgh, PA, [3]Maple Tree Cancer Alliance, Queen Creek, AZ, [4]New York Medical College, New York, NY, [5]Lenox Hill Hospital/Northwell Health, New York, NY

Background/Objective: In fall 2023, the National Accreditation Programs for Breast Centers (NAPBC) adopted new standards. Among the changes is the mandate for referral to exercise programming when patients are under the treatment of a medical oncologist. There are also requirements for a protocol to ensure evaluation for functional deficits at the beginning of surgical, medical, and radiation oncology treatment, with the assumption that appropriate referrals to rehabilitation services or exercise oncology will follow. Prior to this, however, approximately 5% of cancer patients exercised during treatment1 and more than one-third of the US population currently does not have access to an exercise oncology program. Understanding that implementing exercise programs to meet these new accreditation standards will constitute a change in clinical workflow, we used the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework to evaluate one such program.

Methods: Patients being treated for breast cancer were referred by their breast surgeon into a 12-week individualized, supervised exercise program, delivered via telehealth. Patients met with their Exercise Oncology Instructor one day/week for 60min/session, and completed a full body workout incorporating aerobic, resistance training, and flexibility components. Physical function, fatigue, and symptom severity were assessed at baseline and at 12-week follow up for each patient. In addition, the RE-AIM framework was used to evaluate the implementation of this program after six months of its initial offering. Based on these results, an educational program on the benefits of exercise during cancer was offered to Tumor Board, physician assistants, and surgical team. In addition, ease of referral and communication strategies were implemented. After three months, the key performance indicators (KPIs) identified in the RE-AIM framework were reassessed.

Results: For the first 6 months of the initial program offering, the clinical exercise oncology program reached 54.5% of potential patients to offer the intervention. Efficacy of this program was demonstrated with a 23.6% improvement in physical function, 4.87% improvement in emotional health, and 5.7% increase in health-related quality of life. Of the patients offered the intervention, 11% agreed to participate (adoption). Following the educational sessions, KPI values included a current reach of 61% (increase of 6.5%). Physical function increased by 27.3%, 7.6% improvement in emotional health, and 6.2% increase in health-related quality of life. Finally, adoption increased to 33% (increase of 22%).

Conclusions: As health care teams look to meet the new NAPBC standards, implementation strategies measuring multiple dimensions of program effectiveness should be considered. A combination of physician education, effective communication, and ease of referrals can direct decision making and positively impact patients battling breast cancer.

1688187 - Analyzing Trends in Breast Surgical Oncology Fellowship Match Rates

Fedra Fallahian, Catherine Jennings, Rachel Wooldridge, Deborah Farr, Anthony Froix, Stephanie Serres, Shruti Zaveri, Anvy Nguyen, Marilyn Leitch

University of Texas Southwestern, Dallas, TX

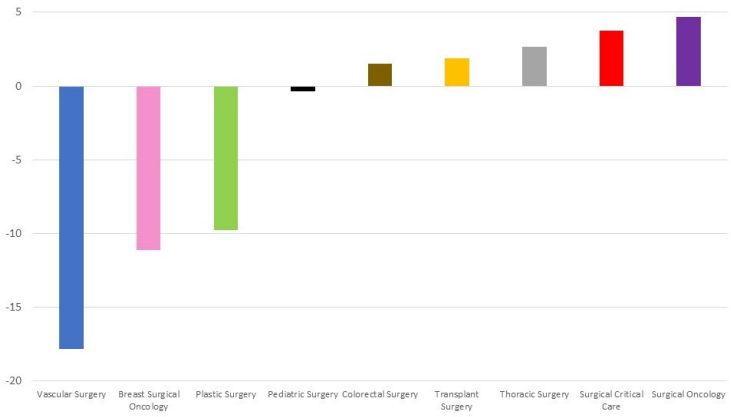
Background/Objective: Prior to 2003, only 20-25% of surgery residents pursued fellowship training. In the last 2 decades the proportion of surgical residents pursuing subspecialty fellowships has increased to 80%. his study compares application and match rates in breast surgical oncology (BSO) to other surgical subspecialties.

Methods: The Society of Surgical Oncology provided applicant and program data from the BSO Match (2021-2023). The numbers of available positions and programs, applicants, and match rates were evaluated from 2021-2023. The National Resident Matching Program and the San Francisco Match provided match information for complex general surgical oncology (CGSO), colorectal surgery (CRS), pediatric surgery (PS), plastic and reconstructive surgery (PRS), thoracic surgery (TS), surgical critical care (SCC), vascular surgery (VS), and transplant surgery (TPS).

Results: The match rate for BSO decreased from 88.2% to 77.2% (p=0.039) over a three-year period. In the same period, the number of applicants increased from 85 to 114 (34%), and four new fellowship programs joined the match with five additional positions from 83 to 88. Across all surgical subspecialties, BSO had the largest increase in number of applicants (30). The annual percentage of applicants who did not match increased from 11.8% to 22.8% (p=0.039). BSO had one of the greatest decreases in match rate (-11%), surpassed only by vascular surgery (-18%). The specialties with the greatest increases in match rate over the last three years were CGSO (+5%), SCC (+4%), and TS (+3%). CRS and TPS also saw modest increases in match rate. The number of applicants to surgical subspecialties increased from 1197 to 1494 over a three-year period. The percentage of BSO applicants increased from 7.11% to 7.61% (p>0.05). In 2023, the median match rate amongst all surgical subspecialties significantly decreased to 73.4% compared to 76.4% in 2021 (p=0.047).

Conclusions: The fellowship match for surgical subspecialties as a whole is becoming more competitive. BSO demonstrates one of the greatest declines in match rates despite an increased number of training programs and appears to be gaining in popularity as number of applicants increase. More research is needed to elucidate differences in match rates by applicant characteristics and changes in number of training slots.

Figure 1: Percentage difference in match rate from 2021-2023



1687390 - Surgical Considerations in Hormone Receptor-positive, HER2-negative Invasive Breast Carcinomas Treated with Neoadjuvant Endocrine Therapy

Mine Yilmaz, Nisha Unni, Helena Hwang, Sunati Sahoo, Yisheng Fang

UT Southwestern Medical Center, Dallas, TX

Background/Objective: Despite the low rates of pathologic complete response (pCR) in hormone receptor positive (HR+)/Her2 negative (HER2-) breast cancer (BC) patients, neoadjuvant endocrine therapy (NET) has been widely used in multiple subgroups of patients such as elderly patients, patients with locally advanced disease or other comorbidity and patients with a longer waiting time for definitive surgery. Additionally, NET has become an important platform to compare different endocrine agents and to test efficacy of new agents such as CDK4/6 and PI3K/mTOR inhibitors. The aim of this study was to assess treatment response in primary tumors with special attention to change in tumor size.

Methods: In this IRB approved retrospective study, 90 patients who underwent definitive surgery after NET from 2020 to 2023 were analyzed. Pre-treatment tumor size was evaluated based on multiple imaging findings and the post treatment size was determined from the microscopic measurement of resected tumor on mastectomy specimen. Tumor markers were performed in all patients prior to NET and proliferation index was determined using Ki-67 (MIB1) on both pre- and post-treatment specimens. Multivariable analysis was performed with linear regression and a P-value of < 0.05 was considered statistically significant.

Results: Of the 90 patients, 87.78% (n=79) were treated with aromatase inhibitor, 11.11% (n=10) with Tamoxifen, and 1.11% (n=1) with Lupron. The age range for the cohort was 34 to 89 years (mean 63 years). The pre-treatment tumor size ranged from 5 mm to 100 mm (mean 23.1 mm) and the post-treatment size ranged from 1.2 to 180 mm (mean 22.8 mm). There was no significant difference in tumor size before and after NET ($p > 0.05$, Figure 1). Analysis of the Ki-67 in the pre-treatment carcinoma (range 1% to 80%, mean 21%) and post-treatment residual carcinoma (range < 1% to 35%, mean 9%) revealed significant reduction in proliferation rate after NET ($p < 0.05$, Figure 2).

Conclusions: pCR is rare after NET and cannot be used as a biomarker to predict long-term outcomes. Therefore, routine testing to assess proliferation index in both pretreatment and post-treatment samples is vital for accurate prognostications. Since there is no significant reduction in tumor size after NET, the extent of the surgical excision in patients who undergo breast conserving surgery should be based on the original tumor size.

Figures: Tumor size and Ki67 percentage comparison before and after neoadjuvant endocrine treatment

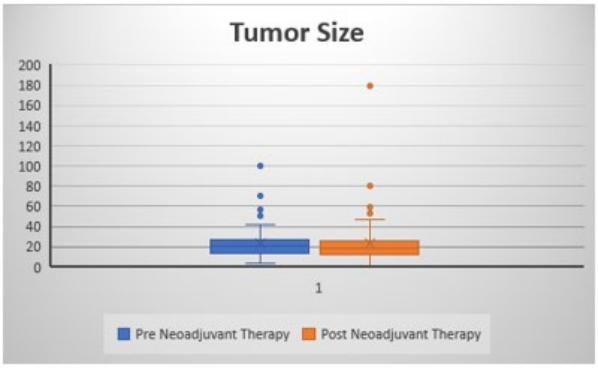


Figure 1

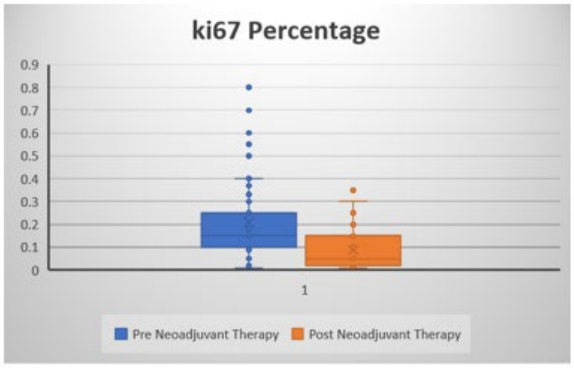


Figure 2

1688231 - Circulating Tumor Cells (CTCs) Are Correlated with Subtypes of Breast Cancer: A Study on Bangladeshi Patients

Shakera Ahmed[1], Muhammad Mosaraf Hossain[2], Nasrin Sultana[3], Ramendu Parial[2], Maliha Subat[3], Nusrat Nayeema[4], S M Sabbir Alam[2], Manisha Das[5], Nusrat Jerin[2]

[1]Chittagong Medical College and Hospital, Chattogram, Chittagong, Bangladesh, [2]University of Chittagong, Chattogram, Chittagong, Bangladesh, [3]Chittagong, Bangladesh, [4]Chittagong Medical College, Chittagong, Bangladesh, [5]EuGEF Research Foundation, Chattogram, Chittagong, Bangladesh

Background/Objective: Breast cancer has a heterogeneous pathophysiology characterized by varied molecular subtypes with diverse clinical outcomes. Due to the increasing incidence and disease progression rates and undefined relapse periods, reliable disease monitoring is a challenge and has remained an unmet need. Advancements in liquid biopsy have significantly enhanced our understanding of clinical oncology. CTC-based liquid biopsy is emerging as a reliable prognostic tool to predict various clinical indicators. Although extensively investigated in metastatic breast cancers, little is known about CTCs in early-stage breast cancers. Moreover, the identification of CTCs for different molecular subtypes of breast cancer in an early stage is currently an unmet demand that we tried to evaluate.

Methods: In this prospective clinical trial (CMC 59.27.0000.013.19 PG.009.2022/262), 68 patients of different stages with luminal (A +B, 30.9%), HER 2 positive (16.2%), triple-negative (17.6%) and undetermined (35.3%) subtype were recruited in this study. CTCs were detected from 1.5 ml blood using the Drug Controller General of India-approved OncoDiscover CTC test kit. This platform contains affinity-based magnetic nanoparticles to mediate EpCAM-based CTC isolation. CTCs were detected by positive staining of Cytokeratin (CK18+), DAPI (DAPI+), and the absence of CD45 signal (CD45-) using a fluorescence-based automated digital imaging platform.

Results: CTCs were detected in 63.2% of patients with a mean CTC count of 1 cell / 1.5ml blood. The luminal subtype was the least prevalent among CTC-positive patients (61.9%), followed by the undetermined (62.5 %) and TNBC (66.7 %) subtype, while all HER2-positive patients were positive for CTCs. CTC clusters were detected in 19% of patients, and most patients who tested positive for CTC clusters fall into the Luminal (23.8%) and HER2+ (36.4%) subtypes. CTC cluster positivity was lowest (8.3%) in TNBC patients. When analyzed on the scale of tumor grade, grade I patients did not show the presence of CTC, while 63 % of grade II patients had ≥ 1 CTC. All grade III patients showed the presence of ≥ 1 CTC. CTC-positive grade II patients had a high CTC count (average 2 CTCs), which had a positive correlation with the presence of CTC clusters in these patients. Patients who had surgical intervention had a low CTC burden (50%) compared to patients without surgical resection (68.6%). 63.2% of chemotherapy treatment-naive patients showed positivity for CTC, while 58.6 % of chemotherapy-treated patients showed positivity. Compared to 50% of patients who underwent surgery followed by chemotherapy and radiotherapy, 75% of patients who received naïve treatment tested positive for CTC.

Conclusions: In patients with early-stage breast cancer, the presence of CTCs may indicate a biological progression of the disease. CTC detected in all HER2-positive patients suggested the high-shedding nature of these tumors, which correlates well with their reported migratory tendency. A higher CTC count is positively associated with the breast cancer grade. In patients who tested positive for CTC, combined treatment (chemotherapy and radiotherapy) reduced CTC counts. However, since this data is based on a single point in time, a larger sample size and longitudinal correlation with CTC are required.

1688184 - Outcome of Patients with Pregnancy Associated Breast Cancer Who Have Subsequent Pregnancies

Alissa Doll[1], Nimmi Kapoor[2], Marla Lipsyc-Sharf[1], Myung Shin Sim[4], Jennifer Baker[1]

[1]David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA, [2]David Geffen School of Medicine at UCLA, Encino, CA, [4]University of California Los Angeles, Los Angeles, CA

Background/Objective: Women diagnosed with breast cancer during or shortly after pregnancy endure unique diagnostic and treatment challenges that are well known. After treatment, however, some of these young women may still desire the option of future pregnancy, yet subsequent pregnancy following treatment for pregnancy associated breast cancer (PABC) is a subject that has not been thoroughly explored. While safety of pregnancy after breast cancer has been demonstrated in the POSITIVE trial, the same cannot be said about subsequent pregnancy in women with PABC. The aim of this study is to describe the incidence and clinical outcomes of patients with PABC with subsequent pregnancies after breast cancer treatment compared to those without another pregnancy.

Methods: PABC was defined as a breast cancer diagnosed during pregnancy or postpartum within five years of delivery. A retrospective chart review identified patients with PABC between the years 2011 and 2023. Patients with PABC were then screened for any further pregnancy. Patient characteristics, tumor biology, treatment course, recurrence rate, survival, and outcome of subsequent pregnancies was evaluated. Chi-square and t-test were used to compare SP-PABC to NSP-PABC for descriptive analysis and Kaplan Meier method and Log Rank test were used to estimate 5-year disease free survival.

Results: There were 39 patients identified with PABC, 31 of whom had PABC and no further pregnancies (NSP-PABC) and 8 with documented subsequent pregnancy (SP-PABC). Approximately one-third of all patients had pregnancy during breast cancer and two-thirds had postpartum PABC with median time to breast cancer diagnosis from delivery of 22.5 months (range 2-52 months). Overall, median patient age was 36 years and 30.8% of patients had a documented genetic predisposition to breast cancer. More patients had Stage II breast cancer (33.3%) than any other stage, 51.3% underwent neoadjuvant chemotherapy, and 53.8% underwent bilateral mastectomy. Compared to patients with NSP-PABC, patients with SP-PABC were significantly younger and less likely to have any pregnancy prior to their diagnosis of PABC ($p=0.04$ and 0.002, respectively). No patients with SP-PABC presented with stage IV breast cancer compared to 19.4% of patients with NSP-PABC ($p< 0.01$). Overall median follow-up time was 5 years, with median 6.75 years in the SP-PABC group and 3.5 years in the NSP-PABC group. One patient in the SP-PABC group experienced a local-regional recurrence and 2 patients in the NSP-PABC group who presented with Stage IV disease died of breast cancer. Calculated 5-year DFS rates were 86% and 75% for SP-PABC and NSP-PABC groups, respectively ($p=0.414$). Within the SP-PABC group, timing from PABC to subsequent pregnancy was an average of 28.4 months (range 16-55 months) and seven of the eight patients had successful deliveries (see table).

Conclusions: This study provides the first descriptions of patients with PABC and subsequent pregnancy. Younger patients with PABC who have fewer children and less advanced disease are more likely to desire additional pregnancy and may benefit from this data. Additional investigation, likely with pooled analysis from multiple institutions, is necessary to determine the oncologic and obstetric safety of pregnancy following PABC.

Table 1: Characteristics of patients with subsequent pregnancy after pregnancy associated breast cancer (SP-PABC)

Patient	Age at PABC Dx	Genetic Mutation	Relation of pregnancy to cancer diagnosis	PABC Pregnancy outcome	Tumor Type	**Biomarkers**	Stage	Systemic Treatment	Surgical Treatment	Time from PABC to next pregnancy (months)	Outcome of subsequent pregnancy	Locoregional or Distant Cancer Recurrence	Follow-Up (years)	Death
1	31	None	1st trimester	TAB	unknown	ER+/Her2+	unknown	Neoadjuvant ACTH/TAM	PM/NA	42	SAB	No	11	No
2	31	None	14 mo PP	Delivery	IDC	ER+/Her2-	T1N0	None/TAM	BM/SLNB	55	Term infant	No	11	No
3	41	None	1st trimester	Delivery	DCIS	ER+	pTis	None	BM/SLNB	15	Term infant	No	2	No
4	36	CHEK2	32 mo PP	Delivery	DCIS	Not tested	pTis	None	BM/SLNB	23	Trisomy 13	No	5.5	No
5	36	BRCA1	8 mo PP	Delivery	IDC	ER+/Her2-	T2N1	Adjuvant TC/AI	BM/SLNB	34	Pre-term infant	Yes	4.5	No
6	27	None	25 mo PP	Delivery	IDC	ER-/Her2+	T2N2	TCH	BM/ALND	19	Term infant	No	12	No
7	32	No test	1st trimester	Delivery	DCIS	ER-	pTis	None	PM/SLNB	23	Term infant	No	4	No
8	32	None	48 mo PP	Delivery	IDC	ER-/Her2-	T4dN1	TC	BM/ALND	16	Term infant	No	8	No

Abbreviations: mo = months; PP = post-partum; TAB = therapeutic abortion; ER = estrogen receptor; Her2 = human epidermal growth factor 2; ACTH = doxorubicin, cyclophosphamide, paclitaxel, trastuzamab; TC = Taxotere, cyclophosphamide; TCH = Taxotere, carboplatin, herceptin; PM = partial mastectomy; BM = bilateral mastectomy; SLNB = sentinel lymph node biopsy; ALND = axillary lymph node dissection; SAB = spontaneous abortion

1688197 - Locoregional Recurrence and Overall Survival Among Patients Undergoing Neoadjuvant Chemotherapy and Mastectomy With Residual Axillary Disease According to Extent of Axillary Surgery

Alissa Doll[1], Danielle Graham[1], Anouchka Coste Holt[2], Julie Le[3], Alexandra Klomhaus[1], Nimmi Kapoor[4], Susan McCloskey[5], Jennifer Baker[1]

[1]David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA, [2]Unified Women's Healthcare, Boca Raton, FL, [3]UC San Diego Health, San Diego, CA, [4]David Geffen School of Medicine at UCLA, Encino, CA, [5]University of California Los Angeles, Los Angeles, CA

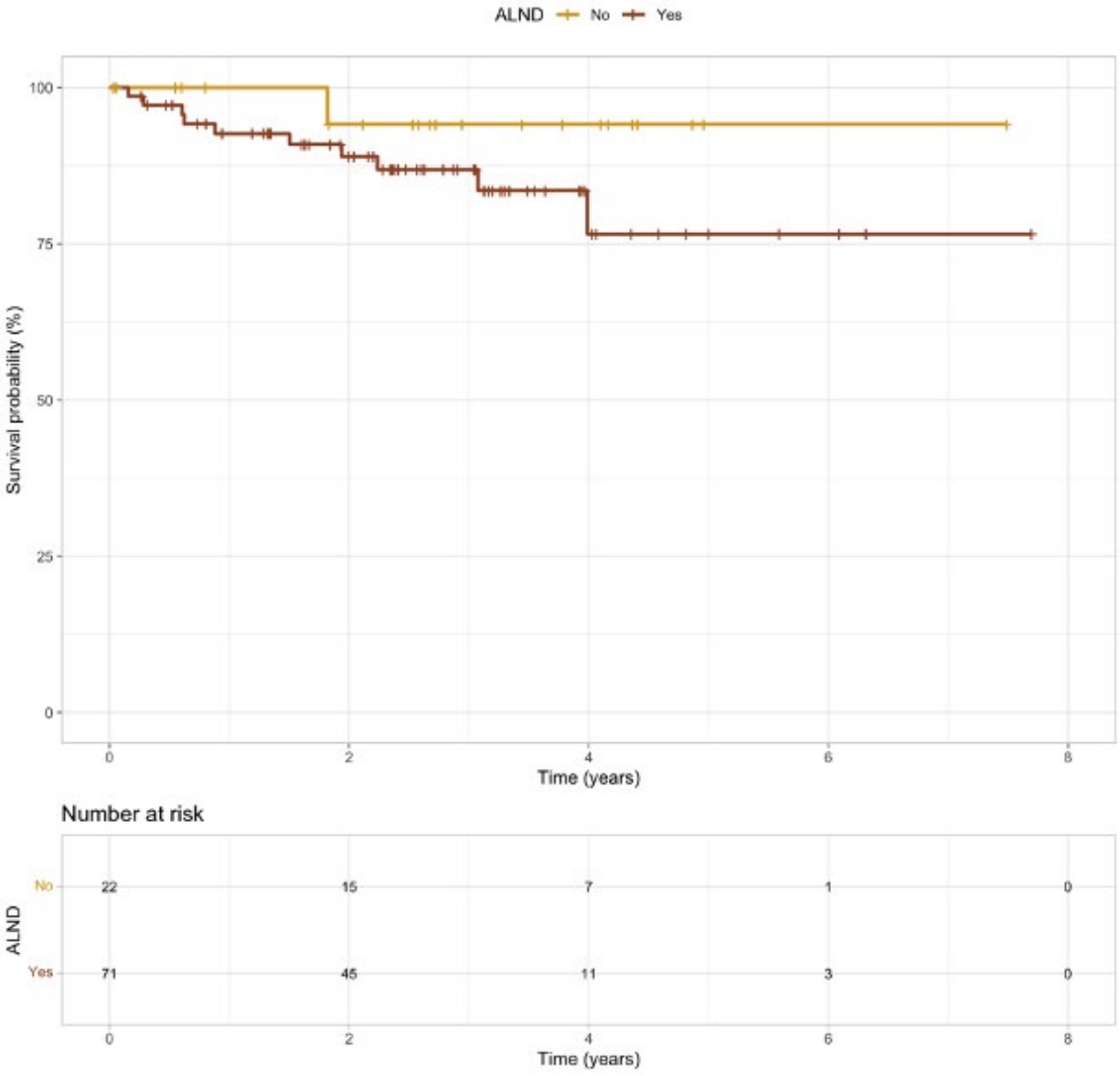
Background/Objective: Patients with pathologically positive lymph nodes (ypN+) following completion of neoadjuvant chemotherapy (NAC) are recommended to undergo axillary lymph node dissection (ALND) with or without regional nodal irradiation (RNI). While the risks of ALND including lymphedema have been established, the benefit of more extensive locoregional treatment (i.e. ALND + RNI) among ypN+ patients after NAC is not known. While the ALLIANCE 011202 phase III randomized control trial is currently investigating this, we sought to retrospectively evaluate locoregional recurrence (LRR) and survival according to extent of axillary surgery in ypN+ patients undergoing NAC and mastectomy.

Methods: We identified patients with invasive breast cancer treated with neoadjuvant chemotherapy followed by mastectomy and axillary surgery with between 1/16/2014 and 4/7/2020 at a single institution. Only patients with ypN+ disease were included. Clinicopathologic data, type of axillary surgery, as well as receipt of RNI were recorded. Patients who underwent ALND were compared to those who did not. Clinicopathologic variables were compared between the groups using Fisher exact or Wilcoxon tests, accordingly. The association between ALND and overall survival (OS) was examined using Kaplan-Meier survival estimates and multivariable Cox Regression models.

Results: Over the study period, there were 93 patients treated with NAC and mastectomy with ypN+ disease at the time of surgery. Among these patients, 46 (49.46%) were ER+/HER2-, 29 (31.18%) were HER2+, and 18 (19.35%) were ER-/HER2-. 71 patients were treated with ALND +/- RNI, 16 patients with SLNB +RNI, and 6 patients with SLNB alone. Patients who underwent ALND were more likely to have higher clinical T and N stages prior to NAC and more likely to be ypN2/3 compared to ypN1/mic/ITC. At a median follow up of 2.6 years (0.03 – 7.69 years), 10/71(14.1%) patients who underwent ALND experienced a LRR compared to no locoregional events in the group that did not undergo ALND. Among the 10 patients with LRR after ALND, 9/10 also received RNI. There were 11 deaths among total cohort including 10 breast cancer-related deaths. There was no difference in OS among patients who underwent ALND versus those who did not (69% vs 95.5% at 2.6 years, p=0.2), although survival favored patients who did not undergo ALND. On adjusted analysis, receipt of RNI and HER2 positive tumor subtype were associated with improved OS (HR 0.12, 95% CI 0.03-0.55, p = 0.006 and HR 0.04, 95% CI 0.00-0.60, p = 0.019, respectively). Additionally, ypN2/3 vs ypN1/ITC/mic trended towards worse survival but this was not significant (HR 3.48 95% CI 0.91-14.85 p=0.093).

Conclusions: In our small retrospective study, we found that among patients with residual axillary disease after NAC who underwent mastectomy, the receipt of ALND was not associated with protection from LRR or improved OS. Rather, tumor subtype (HER2 positive) and receipt of adjuvant radiation predicted improved survival. This is consistent with outcomes observed in upfront surgery which don't demonstrate survival benefit with more extensive axillary surgery. Longer follow up and results of Alliance 011202 will provide further insight into the role of ALND in this patient cohort.

Figure 1 - Kaplan-Meier survival of ALND versus no ALND



1688638 - Serum Autoantibody Biomarkers for the Detection of HER2-positive Breast Cancer

Anelia Kassi[1], Benjamin A. Katchman[2], Karen Anderson[2]

[1]Arizona State University / Florida Atlantic University, Wilton Manors, FL, [2]Arizona State University, Tempe, AZ

Background/Objective: Breast cancer is a heterogeneous disease where the clinicopathological outcome is dictated by the expression or lack thereof of hormone receptors – estrogen and progesterone – and Human Epidermal Growth Factor Receptor 2 (HER2) protein. Overexpression of HER2 is present in 15-20% of breast cancers and identifies more aggressive tumors with poorer outcomes. The introduction of trastuzumab improved survival drastically and redefined the standard of care. But there are no routinely tested biomarkers that could predict response to treatment or assist with early detection of HER2 positive breast cancer. Antibodies to self tumor antigens, also known as autoantibodies, have been identified in the serum of patients with a variety of cancers before the onset of symptoms. The purpose of this study is to identify a panel of novel serum biomarkers for the diagnosis of HER2 positive breast cancer.

Methods: Serum samples collected at routine mammography from 2000 to 2013 at the Fox Chase Cancer Center were selected retrospectively for patients with breast cancer and the samples were age and sex matched with healthy and benign breast disease controls. There were 83 patients with HER2 positive breast cancer (stages I to III), 53 with benign breast disease, and 81 healthy controls. High-throughput cell free nucleic acid programmable protein arrays were designed to display full-length human proteins that were screened for IgG autoantibodies in the subjects' sera. A total of 7,806 proteins were evaluated, from which 870 were selected for additional validation with the same microarray technique after visual and statistical analyses. RAPID ELISA assays of 65 of these markers were performed on a subset of the patients. Sensitivities and specificity were calculated and a HER2+ classifier was constructed.

Results: We identified a 9-AAb biomarker panel (C5orf40, CHD4, DBN1, TP53, CBX5, PDCD4, CTAG1, CTAG2, and SCAND1) that distinguished HER2+ breast cancer cases from controls with combined 14% sensitivity at 97% specificity. Within that panel, CTAG1, CTAG2, and TP53 had the highest individual sensitivities with specificities above 95% but none reached statistical significance

Conclusions: With high-throughput protein microarray, we generated a 9-autoantibody biomarker panel that could supplement current diagnostic tools in breast cancer, and specifically HER2 positive breast cancer. These 9 AAbs warrant further investigation in clinical studies to determine their value for further understanding the immunological response associated with HER2+ breast cancer and detection.

Table 1: Validation test statistics for 9-AAb panel of potential HER2+ cancer autoantibody biomarkers

	Validation Set 1 (Cases, n = 27; Benign, n = 25; Healthy, n = 22)						**Validation Set 2** (Cases, n = 29; Benign, n = 29; Healthy, n = 29)					
	Cases vs. Benign Controls			**Cases vs. Healthy Controls**			**Cases vs. Benign Controls**			**Cases vs. Healthy Controls**		
Antigen	**Sensitivity**	**Specificity**	**Cutoffs (2SD)**	**Sensitivity**	**Specificity**	**Cutoffs (2SD)**	**Sensitivity**	**Specificity**	**Cutoffs (2SD)**	**Sensitivity**	**Specificity**	**Cutoffs (2SD)**
C5orf40	0.07	0.96	1.88	0.11	1.00	1.57	0.03	0.97	1.04	0	0.97	2.07
CHD4	0.15	0.96	2.14	0.037	0.95	2.55	0.07	0.97	1.25	0	0.97	1.80
DBN1	0.07	0.96	4.06	0.26	1.00	2.41	0.07	0.93	1.34	0	0.97	2.81
TP53	0.11	0.92	2.79	0.07	0.86	3.29	0.14	0.93	1.35	0.10	0.97	1.79
CBX5	0.07	0.96	3.74	0.07	0.91	2.37	0.07	0.97	1.63	0.03	1.00	2.08
PDCD4	0.11	1.00	1.39	0.07	0.95	1.78	0.07	0.97	1.32	0	0.97	1.74
CTAG1	0.11	0.92	1.32	0.11	0.95	1.36	0.21	1.00	1.30	0.10	0.97	1.88
CTAG2	0.07	0.96	1.29	0.07	0.91	1.36	0.14	1.00	1.32	0.10	0.97	1.78
SCAND1	0.11	0.92	1.37	0.07	0.95	1.46	0.07	1.00	1.38	0.03	0.97	1.73
Combined Sensitivity	>2 antigens = 6/27 = 22%			>2 antigens = 7/27 = 26%			>2 antigens = 7/29 = 24%			>2 antigens = 4/29 = 14%		
Combined Specificity	>2 antigens = 3/25 = 88%			>2 antigens = 2/22 = 91%			>2 antigens = 2/29 = 93%			>2 antigens = 1/29 = 97%		

1688661 - Attitudes and Perspectives on Tools for Shared Decision-making Among Breast Surgical Oncologists

Jasmine Jeon[1], Monica Adams[2], Madeline Higgins[3], Sudheer Vemuru[3], Dan Matlock[3], Simon Kim[3], Clara Lee[4], Sarah Tevis[3]

[1]Boston University Chobanian & Avedisian School of Medicine, Parker, CO, [2]University of Colorado Anschutz Medical Center, Adult and Child Center For Outcomes Research And Delivery Science, Aurora, CO, [3]University of Colorado School of Medicine, Aurora, CO, [4]University of North Carolina School of Medicine, Chapel Hill, NC

Background/Objective: Decision Aids (DAs) and discussions of quality of life (QoL) are important factors that may be utilized in fostering shared decision making between clinicians and their patients deciding between breast conserving surgery and mastectomy. Despite the clinical impact of DAs and QoL data on shared decision making, their use continues to be limited in breast surgical oncology practices, thus we sought to assess how breast surgical oncologists perceive DAs and the incorporation of expected post-operative QoL conversations in shared decision making, and further identify facilitators and barriers to implementation in this qualitative study.

Methods: Semi-structured interviews exploring use of DAs and discussions of quality of life in shared decision making were conducted over Zoom with a diverse group of clinically active breast surgical oncologists recruited from member institutions of a national breast surgery oncology research working group from August-October 2023. Interviews were recorded, transcribed verbatim, and qualitatively coded and analyzed using a thematic analysis approach.

Results: Twelve breast surgical oncologists participated in the study. Four main themes with several sub-themes emerged from the qualitative analyses which centered around the facilitators and barriers to implementing DAs as well as experiences with QoL conversations/tools as shown in Figure 1. About half of the participants reported currently using an official DA. However, the majority of participants used a personal adaptation of DA using drawings, diagrams, and photos from the Internet. Many participants thought that DAs do not work for every patient and endorsed barriers to effective DA implementation such as time, fear of overwhelming the patient, ease of use, differences in patient language/culture, preference to speak to patients without a formulated tool, and lack of knowledge on available DAs. All participants emphasized the importance of QoL conversations with patients, but also noted some barriers to implementation. Only a minority reported actual use of QoL measurement tools and addressed a lack of experience on usage of QoL results. Overall, shared decision making and QoL conversations were highly regarded by all surgeons and allowed for higher job satisfaction.

Conclusions: In this study, breast surgical oncologists reported limited use of DAs and QoL measurement tools. Some of the reported barriers to using these tools may be overcome, while others are more complex and may require more nuanced interventions. Regardless, this study is an important step in understanding how physicians perceive available tools to foster shared decision making. As breast cancer patients face multiple surgical options, it is important to make a patient-centered decision to reduce incidence of patient regret, dissatisfaction, and the blaming of unsatisfactory outcomes on clinicians. To build on this study, patient perceptions on DAs and QoL measurement tools should also be explored.

Table 1. Facilitators and barriers to implementation of QoL discussion and assessment tools and DAs

Main Themes	Sub-Themes
Facilitators of QoL discussions/tools during shared decision making	Recognition of patient priorities
	Patient's right to be fully educated and informed
	Physician role to use expertise to set realistic expectations
	Positive thoughts on QoL measurement tools
	QoL measurement instruments good for comparing procedures
Barriers to QoL discussions/tools during shared decision making	QoL measurement instruments challenges
	Lack of training for QoL assessments
Barriers to DAs	Patient barriers
	Admin/Time barriers
	Cultural barriers
	DA related barriers
	Surgeon related barriers
	Preference to have natural conversation
Facilitators of DAs	DAs are useful for select patients
	Previous experience administering DA
	Helpful for select physicians

1684141 - Impact of a Web-based Breast Cancer Surgery Decision Aid on Knowledge and Perceptions of Feeling Informed in Clinics that Care for Socioeconomically Disadvantaged Patients (Alliance A231701CD)

Jessica Schumacher[1], Bret Hanlon[2], David Zahrieh[3], Jennifer Tucholka[4], Grace McKinney[4], Angelina Tan[3], Catherine Breuer[4], Lisa Bailey[5], Anna Higham[6], Julie Wecsler[7], Alicia Huff Arnold[8], Anthony Froix[9], Scott Dull[10], Andrea Abbott[11], Stephanie Fine[12], Kandace McGuire[13], Anna Seydel[14], Patricia McNamara[3], Selina Chow[15], Heather Neuman[4]

[1]University of North Carolina, Madison, WI, [2]University of Wisconsin, Madison, WI, [3]Alliance Statistics and Data Management Center, Mayo Clinic, Rochester, MN, [4]University of Wisconsin School of Medicine and Public Health, Madison, WI, [5]Bay Area Tumor Institute, Oakland, CO, [6]Carle Cancer Center, Urbana, IL, [7]Stroger Hospital of Cook County, Chicago, IL, [8]WellStar/MCG Health/Medical College of Georgia, Augusta, GA, [9]University of Texas-Southwestern, Dallas, TX, [10]Montana Cancer Consortium NCORP, Billings Clinic, Billings, MT, [11]Medical University of South Carolina, Charleston, SC, [12]University of New Mexico, Albuquerque, NM, [13]Virginia Commonwealth University/Massey Cancer Center, Richmond, VA, [14]Marshfield Clinic, Marshfield, WI, [15]Alliance Protocol Operations Office, University of Chicago, Chicago, IL

Background/Objective: Decision aids (DAs) support shared decision making by providing information, establishing role expectations during the consult, and increasing patients' confidence in surgeon interactions. Prior studies suggest that DAs may be particularly beneficial for socioeconomically disadvantaged patients. The objective was to evaluate if a web-based surgical DA was effective in improving knowledge relative to usual care among breast cancer patients in clinics that care for a high proportion of socioeconomically disadvantaged patients.

Methods: A stepped wedge trial was conducted with 10 NCI Community Oncology Research Program clinics (Alliance for Clinical Trials in Oncology Research Base, 6/5/2019-12/26/2021). Clinics were randomized to time of transition from usual care (UC) to pre-consult delivery of a web-based DA. Patients with stage 0-III breast cancer eligible for surgery provided consent prior to a surgical consult (n=576). Patient's perception of feeling informed was assessed on a 0-10 scale, with 10 being the most informed (survey completed just prior to meeting the surgeon). Patient knowledge was assessed using the Breast Cancer Surgery Decision Quality Instrument (survey completed after the consult). Patients were included in this analysis if they completed both the pre-consult and follow-up surveys (n=504). Intervention effects (DA vs UC) were tested with linear mixed-effects models, accounting for surgeon and clinic-level clustering, time, and enrollment post-COVID (main model). Additional models tested the association with patient demographics.

Results: Of the 504 patients included in this analysis, 264 were in the DA intervention arm and 240 UC. Median age was 58.7 years, 68.8% were white, 59.3% had a college degree, and 24% were socioeconomically disadvantaged. Most cancers were small (73.3% less than 2 cm in size) and node negative (78.1%). 49% of patients in the DA intervention arm reviewed the DA. The mean score for perceptions of feeling informed was 5.7 (SD 3.1) for DA and 4.9 (SD 3.2) for UC. The mean total knowledge score was 69.8% (SD 21.3) for DA and 65.9% (SD 22.03) for UC and. DA intervention arm was not statistically associated with total knowledge score in the main model (parameter estimate 3.22, 95% CI -5.00, 11.45, p=0.44) but was associated with higher perceptions of feeling informed (parameter estimate 1.77, 95% CI 0.54, 2.99, p=0.005). In additional models, non-white race and lower education were associated with lower total knowledge scores but not whether patients perceived feeling informed (Table).

Conclusions: In this trial, conducted in clinics that serve diverse populations, no significant relationship was observed between a web-based DA and knowledge, while patients who received the DA perceived feeling more informed. Scores for knowledge and ratings of feeling informed were relatively low across all patients. Future research will explore the discrepancy between non-white and less educated patients perceiving they are informed after receiving the DA despite having lower knowledge scores. Support: UG1 CA189823; AHRQ R01HS025194; https://acknowledgments.alliancefound.org. ClinicalTrials.gov Identifier: NCT03766009

Table 1: Factors associated with patients' perceptions of feeling informed and knowledge

	Perceptions of Feeling Informed (evaluated prior to surgeon consult)		Total Knowledge Score (evaluated after surgeon consult)	
	Parameter Estimate (95% CI*)	p-value	Parameter Estimate (95% CI*)	p-value
Intervention status (Decision aid vs Usual Care)	1.95 (0.68, 3.22)	0.003	1.27 (-6.90, 9.44)	0.76
Age	-0.001 (-0.02, 0.02)	0.94	-0.09 (-0.24,0.06)	0.22
Race White Black Other	 Reference 0.75 (-0.10, -1.60) 0.72 (-0.28, 1.71)	0.12	 Reference -7.82 (-13.37, -2.27) -7.25 (-13.84, -0.65)	0.006
College degree Yes No	 Reference 0.31 (-0.27, 0.89)	0.29	 Reference -6.00 (-9.98, -2.02)	0.003
Socioeconomic disadvantage No Yes	 Reference 0.11 (-0.58, 0.80)	0.76	 Reference -1.39 (-6.03, 3.26)	0.56

1623220 - PECS I/II (Pectoral nerves block) + Sedation as Main Anesthesic Technique for Breast Cancer Surgery

Santiago Sherwell-Cabello[1], Karen Arlen Tapia-Mendoza[2]

[1]ASBrS, Zapopan, Jalisco, Mexico, [2]SMNA (Sociedad Méxicana de Neuro-Anestesiología), Zapopan, Jalisco, Mexico

Background/Objective: Originally, PEC block has been used solely as an analgesic method for breast surgery. In this study, we evaluate the feasibily of the pectoral nerve blocks (PEC I/II) + sedation as the main anesthesic procedure for breast cancer surgery

Methods: Patients informed consent was obtained before surgery. Following the American Society of Anaesthesiology standard monitoring and supplemental oxygen, under titulated sedation to achieve deep sedation with midazolam, fentanyl dexmedetomidine 0.5mcg/kg and propofol TIVA TCI Eleveld 0.6-1.2ng/ml. All patients were on spontaneous ventilation. With arm abducted 90 degrees and under sterile technique, PEC I/II block were performed under ultrasound guidance. PEC II block, located on paramedian sagital plane on midclavicular line at the 3rd and 4th rib level and the serratus anterior and pectoral minor muscles intersection, was done trough administer ropivacaine 3.7% 20ml. Then PEC I block, located at the coracoid process on paramedian sagittal plane identifying the thoracoacromial artery and pertoralis major and minor, was obtained after administrating ropivacaine 3.7% 10ml. A 15 minute latency period was mandatory. On cases of bilateral approach we repeated the same technique but adjusted the doses of local anesthetic to ropivacaine 2.5% with volumes of 20ml on the fascia clavipectoral between serratus anterior and minor pectoral muscles and 10ml between pectoral fascia (pectoral major and minor). The maximum dose of ropivacaine was 150mg to prevent the local anesthetic toxicity risk due to systemic absorption.

Results: A total of 132 patients who underwent surgery were included. The most common breast surgical procedure performed was total mastectomy + SNLB + Reconstruction, followed by BCS + SNLB. The breast surgeries were completele achieved in all patients using PEC block + sedation; conversion to general anesthesia was not needed, only 3 patients required local anesthesia at the time of skin incision. Opioids were not prescrined to any patient during or after surgery. Anesthetic complications were not presented. Postoperative pain free or minimum pain was satisfactory achieved with regular NSAIDs. No patient received opioids. Patient acceptance over general or epidural anesthesia was also considerable higher, due to airway manipulation avoidance and faster postoperative recovery.

Conclusions: The pectoral nerve blocks (PEC I/II blocks) + sedation as main anesthetic procedure is a safe simple ultrasound-guided regional technique that provides adequate analgesia for breast cancer surgery. All kind of breast surgeries were satisfactory performed using PEC block + sedation, including breast reconstruction, providing an excellent analgesic control during or after the surgery, avoiding the use of opioids.

Figure 1: Types of surgery and adverse effects

Types of surgery	#
Radical Mastectomy	8
Total mastectomy + SLNB	16
BCS + DRA	12
BCS + SLNB	28
MRM + Reconstruction	18
TM + SLNB + Reconstruction	47
Simple mastectomy	3
Total	**132**

Adverse events	#
Use of local anesthesia	3
Pneumothorax	0
Use of opioids	0
Hematoma	0
Punction site pain	0
Conversion to general anesthesia	0
Total	**3**

1626882 - Surgeon-initiated Short Course Neoadjuvant Endocrine Therapy Identifies Patients Who Can Forego Adjuvant Chemotherapy in Favor of Endocrine Therapy Alone: Insights from a Melbourne Quaternary Center Breast Unit

Sarah Fennelly

Northern Health, Victoria, Carlton, Victoria, Australia

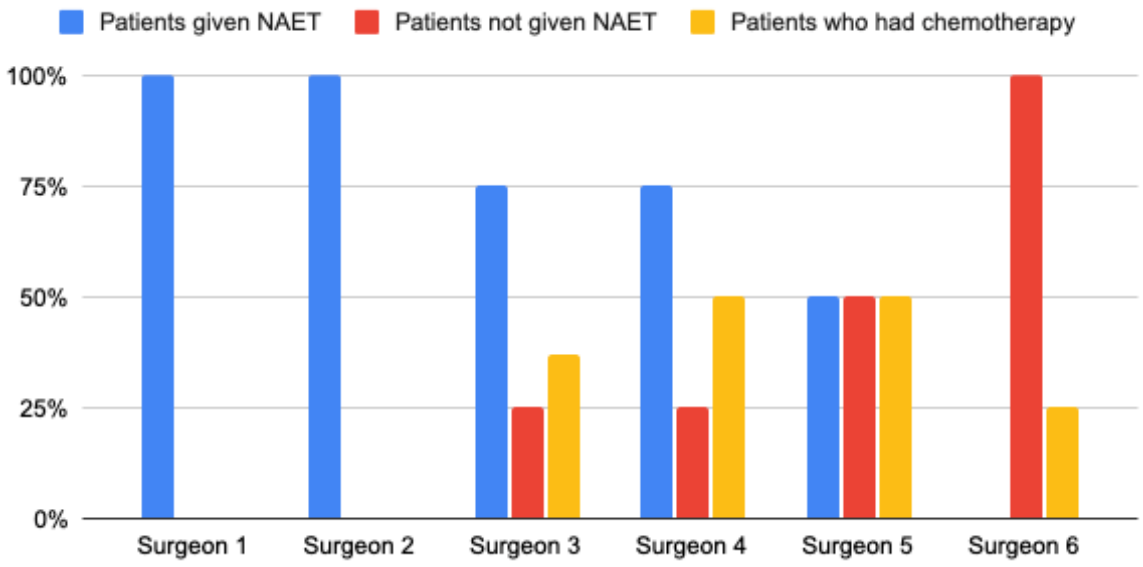
Background/Objective: Neoadjuvant endocrine therapy has been shown to cause a reduction in Ki67 from core biopsy to excision specimen for some patients with hormone positive breast cancer, predicting a stronger response to adjuvant endocrine therapy. Short course NAET was implemented at a Victorian Breast Unit and feasibility, oncological outcomes and surgical outcomes were studied.

Methods: The study included newly diagnosed patients referred to the Breast Unit with hormone-positive breast cancer who had a Ki67 index exceeding 10% during a 6 month period in 2023. The study had several objectives: Assess the feasibility of using short-course Neoadjuvant Endocrine Therapy (NAET) for patients awaiting surgery. Evaluate whether the real-world outcomes of patients mirrored those seen in clinical trials. Investigate whether changes in the Ki67 index influenced the decision-making process for adjuvant therapy. The study encompassed eligible patients who either received NAET or did not. Data recorded for analysis included information about the treating surgeon, changes in the Ki67 index, the duration of NAET, choice of adjuvant therapy, and other relevant oncological and surgical outcomes. The data was recorded from Multi-disciplinary Meeting (MDM) reports, clinic notes and histopathology and radiology results.

Results: 16 of 31 eligible patients discussed at the MDM during the study received NAET. The main factor determining who received NAET and who did not was the treating consultant breast surgeon. Of 6 total breast surgeons in the unit, 2 commenced NAET for all their eligible patients, 2 started it for more than 75% of their patients, 1 started it for 50% of their patients and one started it for no patients. NAET Group Reduction in Ki67 in over 68% of patients Significant reduction (from above 10% to below 10%) in over 43% - none went on to have adjuvant chemotherapy Non-significant reduction over 30% - 40% of these went on to have chemotherapy Increase in Ki67 was seen in 6% Overall, 30% of patients who received NAET went on to have adjuvant chemotherapy. Non-NAET Group Reduction in Ki67 in 28% Significant reduction in Ki67 in 14% 43% of patients who were eligible for NAET but did not receive it went on to have adjuvant chemotherapy. The overall rate of surgical complications was consistent with the general complication rate in the unit.

Conclusions: These findings indicate that Neoadjuvant Endocrine Therapy (NAET) effectively guides adjuvant treatment by considering in vivo Ki67 response, reducing the need for unnecessary adjuvant chemotherapy. Notably, the Multidisciplinary Meeting (MDM) incorporated Ki67 changes into its decision-making, showing a marked difference in chemotherapy referrals between the NAET-receiving and non-receiving groups. Despite the study's limited sample size, it establishes NAET's viability as a treatment planning tool. Furthermore, it emphasizes the crucial role of surgeons as the first point of contact for patients and the influence of consultant preferences. This project aims to increase awareness and promote the optimal use of NAET in breast cancer treatment, minimizing chemotherapy-related lifelong side effects.

Figure 1: Patients who received NAET were less likely to have adjuvant chemotherapy



1686840 - Understanding the Impact of Breast Cancer Surgery: Informing the Need for Future Studies to Improve Experiences and Outcomes of Patients With Early Breast Cancer

Shelley Potter[1], Mhairi MacTier[2], Katherine Fairhurst[1], Jacqui Gath[3], Hilary Stobart[4], Stuart McIntosh[5]

[1]Bristol Medical School, Bristol, England, United Kingdom, [2]Glasgow NHS Trust, Glasgow, Scotland, United Kingdom, [3]Patient Advocate, Belfast, Northern Ireland, United Kingdom, [4]Independent Cancer Patients' Voice, England, United Kingdom, [5]Patrick G Johnston Centre for Cancer Research, Queen's University Belfast, Belfast, Northern Ireland, United Kingdom

Background/Objective: Although most patients receive multimodality therapy, loco-regional treatment including surgery remains a key component of early breast cancer treatment. All treatments have significant morbidities, and there is increasing interest in de-escalating therapies to reduce treatment burden while maintaining good oncological outcomes. An understanding of the impact of individual treatments on patients is therefore vital to the design of future research. This survey aimed to understand the experiences of patients who have received treatment for early breast cancer to inform future risk-adapted studies, with an emphasis on understanding which components of treatment patients would prefer to de-escalate should it be safe to do so.

Methods: An online survey was co-developed with patient advocates to explore respondents' experiences of treatments. Questions included simple demographics, treatments received and views about omitting therapies. The survey was circulated via social media platforms from April-July 2023. Responses were summarised using simple descriptive statistics and free text was analysed thematically.

Results: 235 responses were received. Respondents were mostly white (n=225, 95.7%) and aged 40-60 (n=158, 67.2%). Almost 60% (n=134, 57.0%) lived in the UK, but there was broad geographical spread of respondents from Europe and North America. The median year of cancer diagnosis was 2018 (range 1989-2023). Treatments received included surgery (n=211, 89.8%), radiotherapy (n=150, 63.8%), chemotherapy (n=139, 59.1%) and endocrine therapy (n=158, 67.2%). Of the 197 (83.8%) respondents who expressed a preference, 79 (29.8%) would omit chemotherapy; 62 (26.4%) would choose not to have endocrine therapy; 41 (17.5%) would prefer to avoid surgery and 20 (8.5%) would omit radiotherapy if safe to do so. Surgery was identified as having long-term impacts on respondents' physical and psychological well-being. Many expressed a desire to avoid 'disfiguring' procedures which affected their relationships and quality of life, with others seeking to avoid the need for multiple operations to achieve clear margins, post-operative complications or a period of recovery following surgery. Respondents specifically highlighted a wish to avoid two procedures: mastectomy and axillary node clearance. The psychological impact of losing a breast was a key theme, together with the impact of surgery on body image, ability to dress freely and relationships with partners which were identified as particular concerns. Several women identified a desire to avoid axillary node clearance due to the development of long-term complications such as lymphoedema, and raised concerns as to whether such extensive surgery was necessary for staging and treatment. Respondents were largely supportive of more personalised approaches to breast cancer treatment, although several women commented that survival was their 'absolute priority' and many commented on the need for high quality evidence that reducing treatments was safe.

Conclusions: This survey suggests patients support studies aiming to reduce the burden of breast cancer treatment. Different patients may wish to de-escalate different components of therapy. However, these findings support the clear need to develop and support studies reducing the extent of surgical treatment for early breast cancer, given the impact of both mastectomy and axillary surgery on patients' physical and psychological well-being.

1688211 - Understanding Breast Cancer Surgery Through TikTok: An Analysis of Video Content and Viewer Engagement

Mulin Xiong[1], Jasmine Jones[2], Annelise Fernandez[2], Amy Kirby[1]

[1]Trinity Health Oakland, Pontiac, MI, [2]Ross University School of Medicine, Pontiac, MI

Background/Objective: Given the increasing rate of late-stage breast cancer diagnosis in younger patients, it is important to understand how this population receives and communicates health information. For this demographic, social media has become a prominent platform for entertainment as well as education and may be an important tool in guiding medical decision-making. This study seeks to characterize breast cancer surgery information on TikTok and identify areas in need of improvement.

Methods: The search terms “breast cancer surgery,” “mastectomy,” and “lumpectomy” were queried on TikTok and results were sorted in order of popularity based on number of likes. The top 50 videos for each search term and the profiles of their creators were assessed. Information was compiled regarding the creator’s perceived gender, perceived age, video length, video engagement (likes, favorites, comments), content type, positive or negative sentiment, nature of comments, and creator characteristics. Statistical analysis was performed using Spearman’s rank correlations and t-tests.

Results: Of the initial 150 videos, 8 (5.3%) were duplicated across multiple search terms and 4 (2.7%) were excluded as non-English. We identified 138 videos from 97 unique creators published between 3/28/2020 and 11/2/2023. The videos received a total of 4,895,373 likes and 109,705 comments. Content primarily involved storytelling (57%), education (20%), and dance/music (12%). Ten (10.3%) creators were physicians and 75 (77.3%) were patients. Based on viewer perceptions, 127 (92%) creators were female; 107 (78%) were young (age < 40), 25 (18%) were middle-aged (age 40-60), and 6 (4.3%) were older (age > 60). Median video length was 58 seconds. Perceived creator age had no association with video length. Longer videos were more likely to receive comments ($p=0.014$, $r=0.21$), but no association was found with video likes or favorites. Physician creators had more followers and likes than patient creators ($p< 0.001$), but there was no significant difference in individual video engagement. Only 9 (6.5%) videos included educational content by physician creators. Of the 3 search terms, “mastectomy” was associated with the most engagement ($p< 0.05$). There was no difference in engagement based on positive or negative video sentiment. Viewer comments predominantly conveyed support and interest in learning more.

Conclusions: Our results show substantial breast cancer surgery information being shared on TikTok associated with high levels of viewer engagement and interest. When disseminating healthcare information on social media, factors such as video length, creator background, and search terms can affect impact. Although social media has become widely accessible to all, healthcare information on such platforms are still primarily conveyed by patients sharing personal experiences. Viewership responses indicate an interest in medically informed content and should be further explored.

1688292 - Effects of Scapular-oriented Myofascial Release on the Trapezius and Pectoralis Muscles in Breast Cancer Patients after Sentinel Lymph Node Biopsy and Radiotherapy

Seungpil Jung[1], Minseock Kim[2], Sejun Oh[3], Sang Heon Lee[4], Minhee Kim[5]

[1]Korea University Anam Hospital, Seoul, Seoul-t'ukpyolsi, Republic of Korea, [2]Painfree Clinic, Inche, Inch'on-jikhalsi, Republic of Korea, [3]Human Behavior & Genetic Institute, Associate Research Center, Korea University, Seoul, Seoul-t'ukpyolsi, Republic of Korea, [4]Korea University College of Medicine, Seoul, Seoul-t'ukpyolsi, Republic of Korea, [5]3 Center of Precision Medicine, Korea University Ansan Hospital, Korea University College of Medicine, Seoul, Seoul-t'ukpyolsi, Republic of Korea

Background/Objective: This study aimed to provide preliminary evidence on the effects of scapular-oriented myofascial release (SOMFR) on the biomechanical properties of the trapezius and pectoralis muscles in breast cancer survivors (BCS) after sentinel lymph node biopsy (SLNB) and radiotherapy.

Methods: Thirty-eight BCS were allocated to a single group, while 21 (age = 57.44 years) completed the intervention. The participants underwent the intervention during their radiotherapy sessions at the hospital three times per week for 30 min. SOMFR was performed to relax the upper trapezius and pectoralis major muscles. Measurements were obtained at baseline, mid-test, and post-test to evaluate the biomechanical properties of the trapezius and pectoralis major muscles.

Results: The tone of the upper trapezius and pectoralis major muscles significantly decreased from 12.69 (0.31) to 11.87 (0.34) and 14.75 (3.10) to 13.93 (2.90), respectively. There was a significant decrease in the dynamic stiffness of both muscles from 223.94 (35.95) to 212.21 (22.66) and 249 (71.83) to 257.03 (65.98). The elasticity of both muscles significantly increased from 1.49 (0.27) to 1.56 (0.27) and 1.62 (0.32) to 1.69 (0.39).

Conclusions: Our results provide preliminary evidence that SOMFR may help improve shoulder function in women undergoing radiotherapy and SLNB. These results are encouraging and suggest that SOMFR can be used for early rehabilitation of BCS undergoing radiotherapy immediately after breast cancer surgery.

1684054 - A Novel Approach to Patient Education Using a Personalized 3D Breast Model, and Its Influence on Anxiety, Understanding of the Disease, and Decision-making on Surgical Treatment in Breast Cancer Patients

Joyce Au[1], Jessy Levin[2], Todd Goldstein[3], Alisha Rathi[4], Erna Busch-Devereaux[1], Nina Vincoff[5], Suzanne McElligott[5]

[1]Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, Greenlawn, NY, [2]Weill Cornell Medical College, New York, NY, [3]Feinstein Institutes for Medical Research, Manhasset, NY, [4]Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, New York, NY, [5]Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, Lake Success, NY

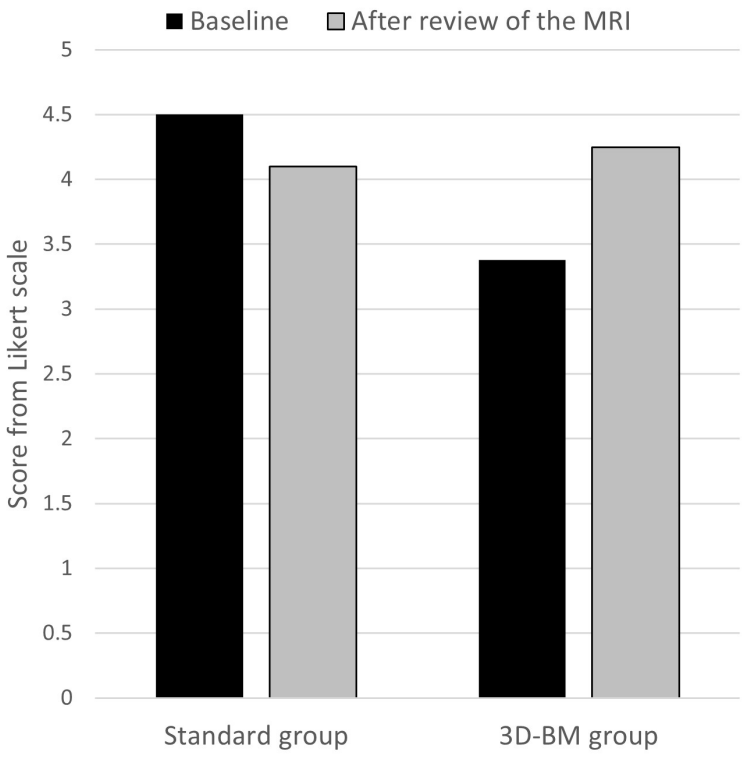
Background/Objective: A diagnosis of breast cancer is overwhelming and anxiety-provoking. It is often difficult for patients to grasp what the tumor looks like and decide between a lumpectomy and mastectomy. We conducted a pilot study to investigate what influence a personalized 3D breast model may have on anxiety, the understanding of the extent of cancer in the breast, and decision-making on surgical treatment.

Methods: Twenty patients with newly diagnosed breast cancer who were recommended to obtain a breast MRI were randomized into two groups - a standard group with their MRI shown on the computer at the follow-up visit, and a 3D breast model (3D-BM) group where the MRI was shown on both the computer and as a personalized 3D model of the patient's breast with the breast tumor. Mimics Viewer software was used to create the 3D breast models from the MRI, and the models were printed from acrylic using stereolithography 3D printers. Patients completed a baseline survey after the initial consultation with the breast surgeon, and a follow-up survey after the MRI was reviewed at the follow-up visit. Anxiety was assessed via the Generalized Anxiety Disorder Scale (GAD-7). Understanding of disease and surgical treatment were assessed on a 5-point Likert scale or multiple-choice questions.

Results: All twenty patients completed the baseline survey. Eighteen completed the follow up survey - 10 in the standard group and 8 in the 3D-BM group. After review of the MRI, the average anxiety score decreased from 7.20 to 6.22 in the standard group representing a 14% decrease; in the 3D-BM group, the anxiety score decreased from 4.80 to 2.22, representing a 54% decrease. The Likert score on understanding how much of the breast was taken up by the tumor decreased by 9% in the standard group and increased by 26% in the 3D-BM group. The Likert score in understanding how far the tumor was from the nipple increased by 7% in the standard group and by 30% in the 3D-BM group. In the standard group, 100% patients were correct about whether a lumpectomy was feasible at baseline, but this fell to 75% after review of the MRI; in the 3D-BM group, 75% patients were initially correct, and this rose to 100% after review of the MRI. In the standard group, 40% patients were correct about whether a nipple-sparing mastectomy was feasible at baseline, and this did not change; in the 3D-BM group, 38% patients were correct at baseline, and this increased to 75% after review of the MRI. After review of the MRI, the proportion of patients interested in a lumpectomy remained the same at 70% in the standard group, and increased from 38% to 50% in the 3D-BM group. 88% of the 3D-BM group agreed that seeing the 3D breast model helped them decide on treatment.

Conclusions: A personalized 3D breast model is a novel approach that may help patients understand the extent of breast cancer and make decisions on surgical treatment. Further study is needed to account for group differences at baseline.

Figure 1: Understanding of how much of the breast is taken up by tumor



1684840 - Believers vs Skeptics: How Patients' Perception of Medication Efficacy and Side Effects Influences Compliance

Sally Justus[1], Margaret Lotz[2], Sarah Keates[2], Susan Pories[3]

[1]Beth Israel Deaconess Medical Center, Boston, MA, [2]Mount Auburn Hospital, Cambridge, MA, [3]Rutgers Cancer Institute of New Jersey, Newark, NJ

Background/Objective: Poor adherence to prescribed long-term oral medications, such as endocrine therapy for breast cancer patients, is an ongoing challenge. Patients' beliefs about their medications' efficacy versus side effects have been shown to influence compliance. Additionally, fatigue, forgetfulness, and feeling overwhelmed are common patient-reported barriers to adherence. Regular exercise diminishes these symptoms and has demonstrated benefit in breast cancer patients. This study aimed to evaluate how patients' beliefs about medicines interacted with a Fitbit-based exercise promotion intervention in affecting medication compliance.

Methods: In this prospective, randomized control trial, newly diagnosed breast cancer and high-risk patients starting hormone therapy were randomized to two groups: the treatment arm was provided Fitbits and educated on the importance of exercise, while the control arm underwent standard care. A sub-group interim analysis of the treatment arm was performed, stratifying the population into 'believers' and 'skeptics' based on their risk-benefit differential determined by a validated Beliefs about Medicines Questionnaire. Data were collected at 3- and 6-months after enrollment and included questionnaires such as the Brief Fatigue Inventory (BFI), Godin Leisure-Time Exercise Questionnaire (Godin), Fitbit step counts, and self-reported medication compliance. A two tailed t-test was used to compare means within and between groups over time.

Results: Findings are summarized in Table 1. Twenty-six patients were believers and 17 were skeptics. There was no difference in age or race. Believers had higher-stage disease (66% Stage I or II vs 37%), and more of them had completed chemotherapy/radiation (73% vs 47%). At baseline, there was no significant difference in BFI scores, though skeptics had higher Godin scores ($p = 0.005$). Godin scores significantly increased at 3 months among believers ($p = 0.02$), while skeptics saw a non-statistically significant decrease. Believers had higher Godin scores at 6 months though this was no longer statistically significant compared to baseline. Skeptics on average had higher daily step counts than believers at both 3- and 6-months. There was no statistical difference in BFI scores at 6 months, though skeptics on average had lower scores representing lower levels of fatigue. There was no statistically significant difference in compliance at 3 months, though believers had higher scores on average (6.4 vs 5.4). There was significantly higher compliance among believers at 6 months ($p = 0.003$), whereas it decreased for skeptics. Skeptics were significantly more likely to report side effects ($p = 0.0008$) and dropped out of the study at a higher rate (35% vs 23%).

Conclusions: Patients who believe that the benefits of their medications outweigh the risks are more adherent and receptive to other recommendations such as daily exercise. Patients already concerned about the risks of medications at baseline report more side effects. There was no significant difference in fatigue, though a slight decline at 6 months was observed in both groups, which may be the result of patients recovering from treatments. These results reveal an opportunity to provide skeptical patients with additional education on the benefits of their medications and resources to address concerns.

Table 1: Summary of findings

	Believers			**Skeptics**		
	Baseline	*3mo*	*6mo*	*Baseline*	*3mo*	*6mo*
Godin Total Exercise Score	29.4	43.2*	37.4	47.3*	42.2	44.0
Daily Steps	-	6421	6185	-	9863	9860
Brief Fatigue Inventory (BFI)	3.2	-	3.0	3.3	-	2.6
Compliance	-	6.4	7.3**	-	5.4	4.6
Side Effects	-	0.0	0.0	-	0.38**	0.39*

** p < 0.05, ** p < 0.005*

1754966 - A Single-arm Pilot Observational Trial to Examine the Impact of a Personalized Breast Cancer Risk Assessment Prior to Gender-affirming Chest Masculinization Surgery

Chandler Cortina, Anna Purdy, Ruta Brazauskas, Samantha Stachowiak, Jessica Fodrocy, Kristen Klement, Sarah Sasor, Kate Krucoff, Kevin Robertson, Jamie Buth, Anne Lakatos, Andrew Petroll, Erin Doren

Medical College of Wisconsin, Milwaukee, WI

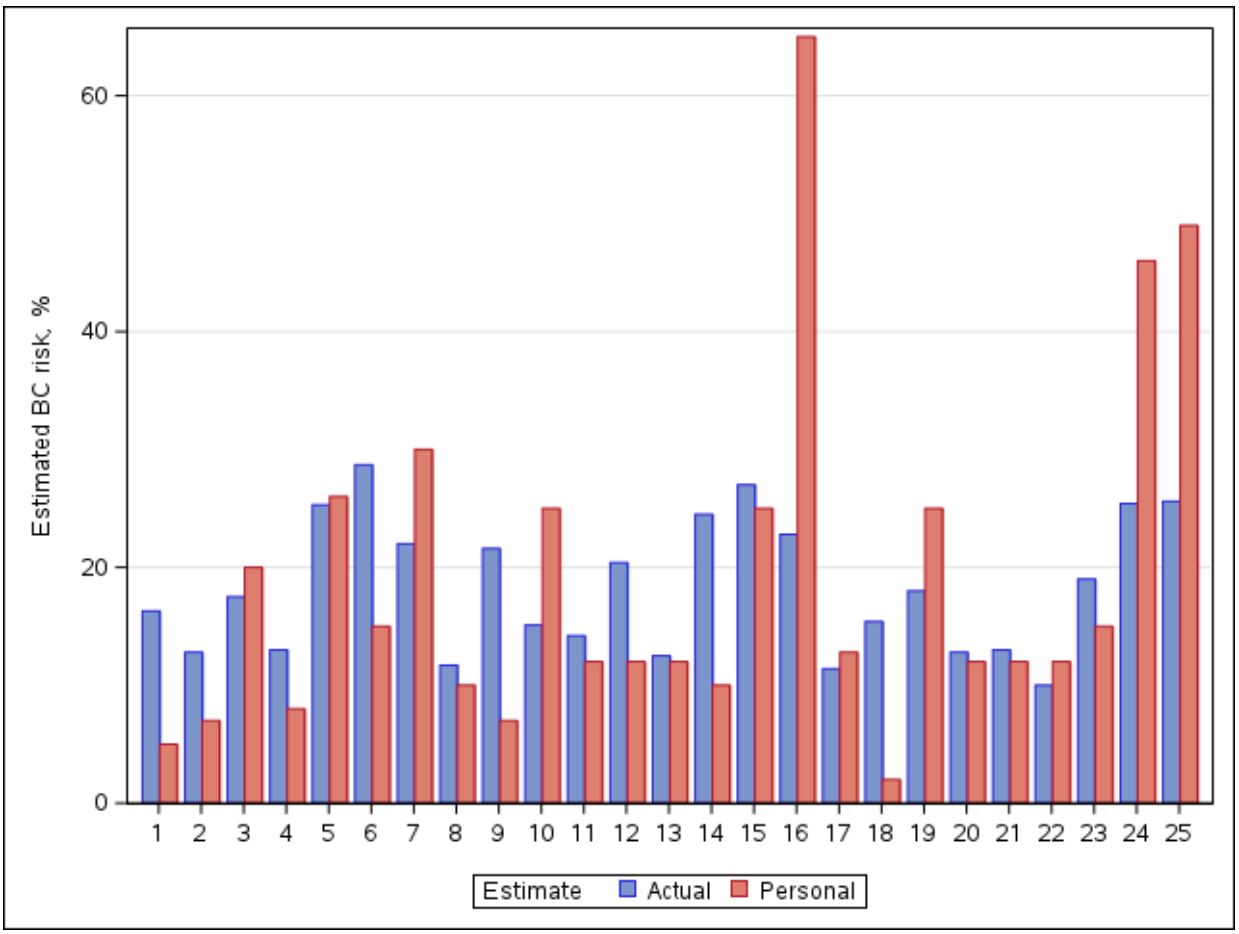
Background/Objective: Persons assigned female and/or intersex at birth who identify as transgender and/or gender-diverse (TGD) may undergo gender-affirming chest masculinization surgery (GACMS) to remove most breast tissue; however, GACMS is not equivalent to oncologic risk-reducing mastectomies (RRM), which aim to remove all breast tissue to reduce future breast cancer (BC) risk. While GACMS has significant benefits, its impact on future BC risk is unclear, particularly for individuals at an elevated BC risk and/or have a pathogenic germline mutation. This study aimed to determine 1) the percentage of TGD persons assigned female and/or intersex at birth considering GACMS with an elevated BC risk, 2) compare self-perceived vs calculated risk, 3) determine the percentage of those at elevated risk who choose to undergo RRM as part of GACMS.

Methods: A single-arm pilot observational trial was conducted from March 2023-December 2023 (NCT06239766). Individuals assigned female and/or intersex at birth, age ≥18, and considering GACMS, were eligible. BC risk was calculated using the IBIS model for all patients and the Gail model those age ≥35; with the highest risk estimate of the two defining calculated risk. Subjects with a family history suggestive of a hereditary cancer syndrome were referred to genetic counseling. Those at average risk (< 17%) were recommended to continue GACMS as planned, those with a moderate risk (17¬–30%) were counseled to consider RRM as part GACMS, while patients with a high lifetime risk (>30%) and/or pathogenic mutation were counseled on the potential utility of RRM. Data was summarized using median and interquartile range (IQR) for continuous variables, and a signed-rank test to compare self-perceived vs calculated risk (significance defined as $p \leq 0.05$).

Results: Goal accrual was met (N=25). Median patient age was 24 (IQR 20–30), 84% were NH-White, 12% Hispanic-White, and 4% NH-Black. All were assigned female sex at birth, were insured, and had at least a high-school diploma. Most identified as transgender (48%) or nonbinary (40%) and 52% had a first and/or second-degree family member with a BC history. Thirteen (52%) had a moderate-risk, 12 (48%) were average-risk, and none were high-risk. Median calculated risk was 17.5% (IQR 13–22.8) vs median self-perceived risk of 12% (IQR 10–25) and was not statistically different ($p=0.60$). Of the 13 subjects at moderate-risk, 5 (38.5%) underwent/are scheduled for GACMS, 3 of which (23%) are undergoing RRM as part of GACMS. Six participants were recommended to meet with a genetic counselor, all of which met with a counselor and recommended to undergo testing, and none were found to have a pathogenic germline mutation.

Conclusions: In this cohort of TGD persons considering GACMS, over half had an elevated lifetime BC risk and there was no statistical difference between self-perceived vs calculated risk. In those with an elevated risk, over half who moved forward with GACMS choose to also undergo RRM. Findings of this pilot study demonstrate the utility of BC risk assessment prior to GACMS and supports longitudinal study to further understand long-term BC incidence association with GACMS vs RRM and patient-reported outcomes.

Figure 1: Self-perceived vs calculated lifetime breast cancer risk for the cohort (N=25). X-axis represents each individual study participant, Y-axis is lifetime risk.



1642558 - Use of an Electronic Decision Aid for Breast Cancer Surgery Options Can Assist with Shared Decision-making

Rachel Kann[1], Jennifer Steiman[2]

[1]University of Pittsburgh School of Medicine, Pittsburgh, PA, [2]Breast Surgical Oncology at UPMC, Pittsburgh, PA

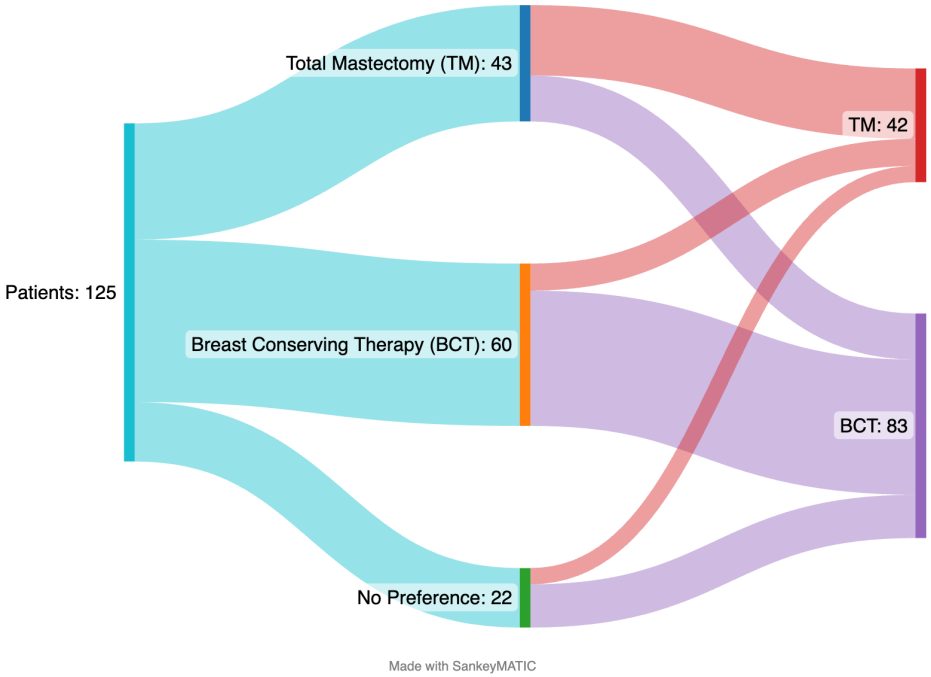
Background/Objective: Shared Decision Making (SDM) between patient and provider is best when a patient's values and choices are known. Use of a Decision Aid (DA) informs providers of surgical preferences and could improve SDM. In this study, we use a DA to investigate initial patient preferences for breast cancer treatment and whether they received that treatment.

Methods: To facilitate communication with their provider, patients used an electronic DA to record their preferences in type of surgery, define their individual values, and answer questions to demonstrate understanding prior to their first clinic visit. From 5/2019-3/2023, 125/579 (22%) patients completed the online DA. Pre-operative surgery preference (total mastectomy [TM] vs breast conservation [BC]) and operative surgery received were evaluated.

Results: 43 patients (34%) preferred a TM, 60 (48%) BC and 22 (18%) had no preference. 26/43 (60%) who preferred a TM received it, 17 (40%) of eligible patients were able to be converted to BCT. 50/60 (83%) who preferred BC received it. 6/22 who had no preference received a TM (27.3%), whereas 16/22 completed BC (72.7%). 10 patients preferred BCT but received TM, 9/10 (90%) due to extent of disease. Of the 103 patients with a preference, 76 received the procedure they desired (74%).

Conclusions: The majority of patients received the surgery for which they had a stated preference on their DA. Of patients who did not receive their preferred surgical procedure, the majority received a less invasive approach (BCT vs TM).

Figure 1: Patient decision pathways



1681535 - ChatGPT Provides High-quality Patient Education Materials for Common Breast Cancer-related Questions

Erin Bayley[1], Hilary Liu[2], Mario Alessandri Bonetti[2], Francesco Egro[2], Emilia Diego[3]

[1]UPMC, Sewickley, PA, [2]UPMC, Pittsburgh, PA, [3]University of Pittsburgh, Pittsburgh, PA

Background/Objective: In the era of digital information, patients often rely on Google to find answers to their questions. However, due to the recent surge in popularity of ChatGPT, a chatbot that combines artificial intelligence (AI) and natural language processing (NLP), patients may turn to ChatGPT for their "curbside consult." Thus, this study aims to assess the quality of ChatGPT as a potential source of patient education by comparing the answers and references provided by ChatGPT and Google for frequently asked breast cancer-related questions.

Methods: A Google search was conducted using the search term "breast cancer." The first 12 questions and answers provided by Google under the "People also ask" section were recorded. The same questions were also input into ChatGPT. Breast surgeons were then asked to grade the quality of the answers provided by ChatGPT and Google from 1 (poor quality) to 5 (excellent quality) according to the Global Quality Score (GQS), a scale to assess the quality of online sources. Respondents were blinded to the information sources. The scores denoting answer quality were then compared, and paired t-tests were performed to evaluate the difference in GQS ratings for Google and ChatGPT answers. To assess the quality of the references, we furthermore attempted to access all references provided by ChatGPT and Google, and categorized the websites as health organization, government agency, scientific article, academic institution, health information website, or private practice.

Results: Twenty-five breast surgeons responded, rating the quality of internet-generated information. The questions and ratings are shown in Table 1. The average score for answers provided by Google was 2.8 ± 1.1, indicating that some information was present but important topics were missing. Meanwhile, the average score for answers generated by ChatGPT was 4.3 ± 0.8, indicating that the source was good quality, with most important topics covered. Differences in score quality also persisted across all twelve questions when assessed individually ($p < 0.05$ for all). With respect to source references, Google provided one reference per answer (12 total). Four (33%) of the sources provided by Google were linked to government agencies, three (25%) to health organizations, 2 (17%) to academic institutions, 2 (17%) to health information websites, and 1 (8%) to a scientific article. Meanwhile, ChatGPT provided an average of 2.2 ± 0.6 references per response. However, several of the links provided by ChatGPT were inaccessible, thus the number of accessible sources per answer was only 1.8 ± 1.0. Of the twenty-one accessible links provided by ChatGPT, seventeen (81%) were to health organizations, two (10%) to government agencies, and two (10%) to academic institutions.

Conclusions: Based on the feedback of twenty-five breast surgeons, ChatGPT outperforms Google in providing high-quality answers to commonly asked questions on breast cancer, highlighting the potential of AI technologies as a superior source of patient education. Although ChatGPT appears to be currently unreliable in terms of providing accurate references, this technology is constantly evolving and can be expected to improve. Thus, the prospect of integrating AI into patient education in the future is very promising.

Table 1: Question prompts, and GQS ratings. GQS, Global Quality Score; SD, standard deviation.

Question	Google GQS (mean ± SD)	ChatGPT GQS (mean ± SD)	*p*
1. What are the top 3 signs of breast cancer?	3.6 ± 0.9	4.6 ± 0.6	<0.001
2. What is the very first stage of breast cancer?	2.9 ± 1.0	4.0 ± 0.8	<0.001
3. What are the 3 types of breast cancer?	1.7 ± 0.8	4.0 ± 0.8	<0.001
4. How long can you have breast cancer without knowing?	3.0 ± 1.1	4.4 ± 0.6	<0.001
5. How quickly does breast cancer spread?	2.2 ± 1.1	4.4 ± 0.7	<0.001
6. Where is the first place breast cancer usually spreads?	3.0 ± 0.9	4.5 ± 0.6	<0.001
7. How long can you live with untreated breast cancer?	2.4 ± 1.2	4.0 ± 0.8	<0.001
8. Where do most breast cancers begin?	3.2 ± 1.0	4.1 ± 0.5	<0.001
9. What age are most breast cancers found?	3.2 ± 0.9	4.6 ± 0.5	<0.001
10. How can you tell the difference between a breast cyst and cancer?	2.6 ± 1.2	4.4 ± 0.7	<0.001
11. What does breast cancer screening include?	3.3 ± 1.1	4.4 ± 0.8	<0.001
12. When should you start screening for breast cancer?	2.7 ± 1.1	3.6 ± 1.4	0.012

1685997 - Geriatric Assessment: A Second Look at Personalized Breast Cancer Care in Older Adults

Morvarid Tavassoli[1], Richard Gilmore[2], Richard Fine[1], Michael Berry[1], Sonia Benn[1], Gregory Vidal[1], Noam VanderWalde[1]

[1]West Cancer Center & Research Institute, Germantown, TN, [2]Margaret West Comprehensive Breast Center, West Cancer Center & Research Institute, Germantown, TN

Background/Objective: Aging and sex are unmodifiable risk factors associated with breast cancer development. Older adult females, defined as age 65 or greater by the World Health Organization (WHO), have a cumulative 45.8% risk of breast cancer diagnosis. Older adult population growth and improved life expectancy is offset by frailty, decreased performance status, and inability to tolerate standard curative treatments. In this study, we sought to evaluate whether geriatric assessment results altered the medical, surgical, or radiation planning in breast cancer care.

Methods: We performed a retrospective analysis of female patients with breast cancer, age 65 or older, who were referred by a breast surgeon for geriatric assessment and curative intent discussion prior to surgery. This was performed at a community-based comprehensive cancer-center from 2019-2022. A screening geriatric assessment using the Cancer and Aging Resilience Evaluation (CARE) survey was conducted at the time of consultation. Cognitive testing was performed using a Mini-Cognitive Assessment, a Deficit Accumulation Technique score was used to calculate frailty index, and an eprognosis nomogram was used to predict median life expectancy. Medical, surgical, or radiation management change was categorized as escalation or de-escalation of the standard of care, and sub-categorized as physician-recommended or patient-driven (treatment refusal, modification, or loss to follow up). Descriptive statistics were conducted using Excel.

Results: Of 37 patients, 17 (45.9%) were Black and 20 (54.1%) were White race. The age range of diagnosis was 65 - 99, with a median age of 79. The most common type of cancer was 23 IDC (62.2%), followed by 9 ILC (24.3%), 3 DCIS (8.1%), and 2 other (5.4%). These were predominantly early stage with 3 stage-0 (8.1%), 16 stage-I (43.2%), 13 stage-II (35.1%), and 5 stage-III (13.5%). Receptor characteristics included 24 hormone-positive (64.9%), 2 HER2-positive (5.4%), and 9 triple-negative (24.3%). Using the cumulative survey score, performance status was deemed 14 frail (38.8%), 10 pre-frail (27.7%), and 12 robust (33.3%). Frailty assessment data was missing for one patient. Eprognostic life expectancy was less than 5 years for 13 (35.1%), 5-10 years for 11 (29.7%), and greater than 10 years for 13 (35.1%). After survey completion, 14 (37.8%) patients continued with standard treatment while 23 (62.2%) had de-escalation of care after geriatric assessment findings. No patient had escalation of care. Changes in management were 10 physician-recommended (43.5%) and 13 patient-driven (56.5%). Patient-driven changes in treatment consisted of 9 refusal of care (69.2%), 2 modification of care (15.4%), and 2 loss to follow up (15.4%).

Conclusions: Geriatric assessments are an informative tool that consider the overall health of older adults. Valuable prognostic data is generated to help guide multidisciplinary discussions for personalized breast cancer care and shared decision making in coordinating treatment plans. In this cohort, 62% of patients had a de-escalation of care after considerate review of geriatric survey findings. Associations between change in management and specific geriatric deficits, demographics, and cancer subtypes should be further evaluated in future studies.

1687594 - Patient's Retrospective Perception of Stressors Over the Course of Breast Cancer Treatment

Melissa Rangel[1], Lilia Lunt[1], Alison Coogan[1], Julia Alexieva[1], Carmin Munoz[2], Marci Lovett[1], Rosalinda Alvarado[1], Andrea Madrigrano[1], Julie Wecsler[3]

[1]Rush University Medical Center, Chicago, IL, [2]Rush University Medical School, Chicago, IL, [3]Stroger Hospital of Cook County, Chicago, IL

Background/Objective: The National Comprehensive Cancer Network (NCCN) distress thermometer (DT) is a validated tool used to quantify the level of patient distress and assess quality of psychosocial stressors. However, there is little data on patient perception of which stressors are most impactful and at which time point during their care. Our objectives are to understand which factors patients find most stressful, understand which treatment time points are most stressful, and assess whether language or demographic factors were predictive of certain stressors.

Methods: From July through November 2023, 43 breast cancer patients at Rush University Medical Center were screened using the NCCN distress thermometer to capture distress scores (DS) and problems. All patients had a breast cancer diagnosis, had undergone breast surgery and had completed all initial therapy including surgery, radiation, and chemotherapy at least one year prior to clinic visit. Patients were asked to complete the NCCN DT survey rating distress retrospectively, considering at time of diagnosis, in the perioperative period and at current surveillance visit and identify which stressors were most impactful. Demographic and cancer characteristic data were collected with retrospective chart review. Predictors of severe distress (DS $\geq$4) were identified with multivariate analysis.

Results: Patients reported a mean DS of 7.28 at time of diagnosis (86.05% severe distress), 6.77 in the perioperative period (88.37% severe distress), and 2.51 at the time of the surveillance appointment (32.56% severe distress), demonstrating a significant reduction in distress reported ($p< 0.005$) In evaluating the most common problem list categories reported in each time interval, emotional concerns were the most common (83.73% reported at diagnosis, 86.05% reported perioperatively, 51.16% reported at surveillance visit). Distress scores at the time of diagnosis and perioperative period were not associated with stage of disease, race, language, insurance status or type of surgery; however, younger age was associated with an increased likelihood of a higher DS at time of diagnosis ($p < 0.449$) in a multivariate analysis. Additionally, at the time of surveillance visit, Stage II disease was associated with an increased likelihood of severe distress in patients controlling for demographic factors, type of treatment and time since cancer diagnosis ($p < 0.0402$).

Conclusions: Distress in cancer patients has been associated with adverse outcomes such as missed appointments, anxiety, and depression. Based on this data, patients recall high levels of distress surrounding diagnosis and surgery, independent of stage of disease and type of therapy received. This DS is reduced when measured at surveillance visits, but almost a third continue to report severe distress, independent of time since diagnosis. This indicates a continued need for screening to identify patients who could benefit from continued psychosocial support.

Table 1: Breast cancer patients' reporting of distress at three time points in treatment

	Initial Diagnosis			Perioperative Period			Surveillance Visit		
	Severe Distress (DT ≥4)			Severe Distress (DT≥4)			Severe Distress (DT≥4)		
	Yes	**No**	p-value	**Yes**	**No**	p-value	**Yes**	**No**	p-value
Number of patients (n)	37 (86)	6 (14)		38 (88)	5 (12)		14 (33)	29 (67)	
Age at Diagnosis (%)			0.106			1.000			0.220
< 60 years	28 (76)	2 (33)		27 (71)	3 (60)		12 (86)	18 (62)	
> 60 years	9 (24)	4 (67)		11 (29)	2 (40)		2 (14)	11 (38)	
Time Since Diagnosis (%)			0.888			0.484			0.534
1-2 years	13 (35)	3 (50)		14 (37)	2 (40)		5 (36)	11 (38)	
2-5 years	6 (16)	1 (17)		7 (18)	0 (0)		1 (7)	6 (21)	
5-10 years	7 (19)	1 (17)		6 (16)	2 (40)		4 (29)	4 (14)	
>10 years	11 (30)	1 (17)		11 (29)	1 (20)		4 (29)	8 (28)	
Insurance Type (%)			0.715			0.855			0.448
Medicaid	2 (5)	0 (0)		2 (5)	0 (0)		1 (7)	1 (3)	
Medicare	16 (43)	2 (33)		16 (42)	2 (40)		4 (29)	14 (48)	
Private	19 (51)	4 (67)		20 (53)	3 (60)		9 (64)	14 (48)	
Ethnicity -Non-Hispanic (%)	30 (81)	5 (83)	1.000	36 (95)	4 (80)	1.000	10 (71)	25 (86)	0.454
Language			1.000			1.000			0.846
English	31 (84)	5 (83)		32 (84)	4 (80)		11 (79)	25 (86)	
Spanish	6 (16)	1 (17)		6 (16)	1 (20)		3 (21)	4 (14)	
Hx of Depression - Yes (%)	3 (8)	1 (17)	1.000	3 (8)	1 (20)	0.954	1 (7)	3 (10)	0.837
FHx Breast Cancer - Yes (%)	16 (43)	3 (50)		16 (42)	3 (60)	0.781	7 (50)	12 (41)	0.837
Stage			0.796			0.527			0.215
DCIS	3 (8)	1 (17)		3 (8)	1 (20)		1 (7)	3 (10)	
I	22 (60)	3 (50)		23 (61)	2 (40)		6 (43)	19 (66)	
II	9 (24)	1 (17)		8 (21)	2 (40)		6 (43)	4 (14)	
III	3 (8)	1 (17)		4 (11)	0 (0)		1 (7)	3 (10)	
Surgery Type			0.908			0.611			0.491
Mastectomy	23 (62)	3 (50)		24 (63)	2 (40)		10 (71)	16 (55)	
Lumpectomy	14 (38)	3 (50)		14 (37)	3 (60)		4 (29)	13 (45)	
Recon Surgery-Y(%)	15 (40)	3 (50)	1.000	16 (42)	2 (40)	1.000	7 (50)	11 (38)	0.673
Chemotherapy-Y (%)	21 (56)	2 (33)	0.531	20 (53)	3 (60)	1.000	10 (71)	13 (45)	0.189
Radiation Therapy-Y(%)	23 (62)	4 (67)	1.000	24 (63)	3 (60)	1.000	7 (50)	20 (69)	0.385
Endocrine Therapy-Y (%)	21 (57)	4 (67)	0.992	23 (61)	2 (40)	0.695	6 (43)	19 (66)	0.279

1679016 - A Surgeon-performed Deep Serratus Block Reduces Pain after Lumpectomy plus Axillary Surgery: A Proof of Concept

Jordan Jackson, James Mirocha, Xuanji Wang, Farin Amersi, Catherine Dang, Alice Chung, Marissa Boyle, Armando Giuliano, Scott Karlan

Cedars Sinai, West Hollywood, CA

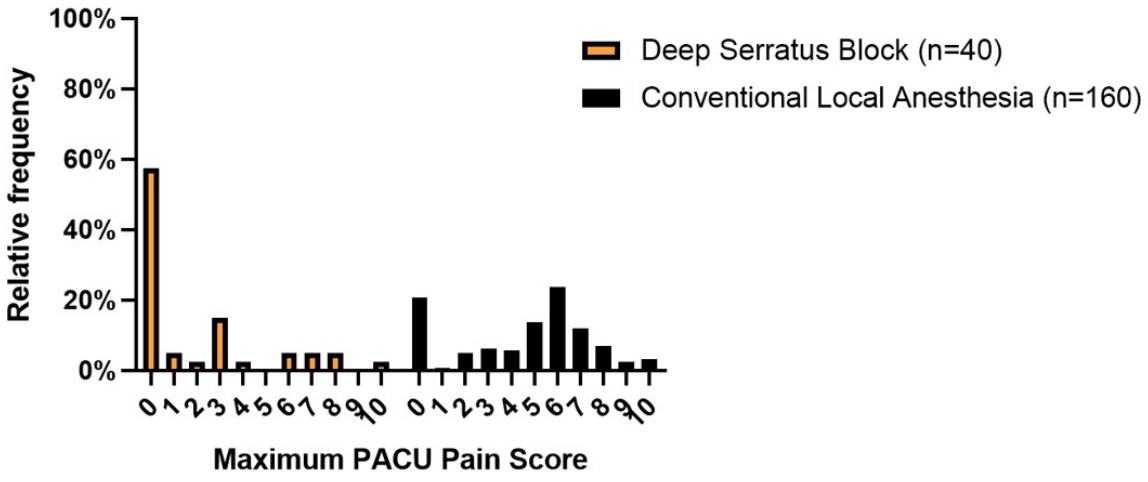
Background/Objective: Regional blocks reduce pain after mastectomy, have limited benefit after lumpectomy, and are yet to be studied after lumpectomy plus axillary surgery (sentinel node biopsy, targeted axillary dissection, or axillary dissection). We hypothesized that a surgeon-performed deep serratus block would reduce immediate post-operative pain and narcotic utilization, compared to treatment with conventional local anesthesia.

Methods: All surgeons in our group administer long-acting local anesthetics when performing lumpectomy plus axillary surgery. Starting in 2022, one of the surgeons began to add a deep serratus block, hoping to improve axillary anesthesia. We identified the first 40 patients treated with lumpectomy plus axillary surgery by each surgeon in the group, by searching a prospective institutional database from January 1, 2022 through August 31, 2023. We tabulated the maximum PACU pain score and PACU narcotic use, which was converted to oral morphine equivalents (OME).

Results: 40 patients received a deep serratus block, and 160 patients were treated with conventional local anesthesia. 57.5% (23/40) of patients in the deep serratus block group had a maximum pain score of zero compared to 20.6% (33/160) of the other patients (RR 2.8, 95% CI 1.9-4.2, p< 0.0001) (Figure). Furthermore, the mean pain score was significantly lower in the deep serratus block group (2.0 vs. 4.6; p< 0.0001). 72.5% (29/40) of patients in the deep serratus block group required no narcotics in the PACU compared to 28.1% (45/160) of the other patients (p< 0.0001); the mean OME score was also significantly lower (3.5 vs. 12.4, p< 0.0001).

Conclusions: A surgeon-performed deep serratus block is associated with lower pain scores and less PACU narcotic utilization after lumpectomy plus axillary surgery. A follow-up study is underway to determine whether less pain in the PACU translates into less pain and narcotic use after discharge.

Figure 1: Maximum PACU pain scores after treatment with a deep serratus block vs. conventional local anesthesia



1688663 - Optimizing the Preoperative Testing Pathway: Our Approach to Smarter Care Virginia

Elizabeth Fish, Tananchai Lucktong

Virginia Tech Carilion Clinic, Roanoke, VA

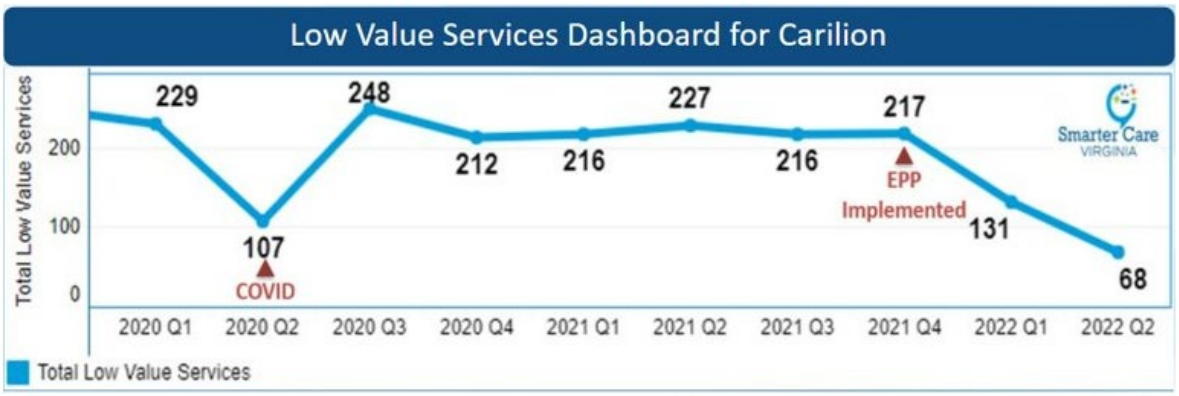
Background/Objective: Smarter Care Virginia (SCV), a program to reduce low-value health services, identified excess preoperative testing as an opportunity for improvement at our center. Our protocol was a manual process with limited consideration of procedure risk. We hypothesized that protocol optimization would reduce testing among low-risk patients undergoing low-risk operations (i.e., ASA class 1 or 2 patient undergoing a lumpectomy with sentinel node biopsy).

Methods: Our protocol was modified to decrease preoperative testing in SCV patients. In a 3-month pilot, ambulatory surgery patients were tested by modified protocol. This protocol was then built into Epic Procedure Pass (EPP) to automate test selection. A reporting system based upon ASA status, CPT coding, and completed tests was developed. Fisher's exact test was used to compare testing rates for the pilot cohort with a similar cohort after EPP implementation. Rates of tests per SCV case for 6 months before and after EPP by specialty were evaluated using two proportion z-test. NSQIP and cost data were examined.

Results: After EPP implementation, pilot data demonstrated reductions in hemoglobin A1C (94%, $p< 0.0001$) and CBC with differential (80%, $p< 0.0001$). Among SCV patients, across multiple specialties, overall testing per case decreased by 23.5% (paired t-test, $p=0.0028$) and overall day-of-operation testing remained stable (paired t-test, $p=0.475$). Our NSQIP facility post-op occurrences rate did not increase (pre-EPP = 15.9%, post-EPP = 13.5%, z-score test, $p=0.059$). An average cost savings of $30 per case was observed, annualizing to ~$360,688.

Conclusions: Preoperative testing optimization can reduce unnecessary testing, patient harm, and healthcare costs without increasing day-of-operation testing or post-op complications. Reporting based upon ASA status, CPT coding, and tests completed can be used to monitor perioperative efficiency and help identify areas for future improvement.

Figure 1: Decrease in low-value testing after EPP implementation



1688674 - Post-operative Narcotic Use - Overprescribing for All Breast Surgery Types

Sneha Mittal[1], Benjamin Allen[1], Hannah Hingtgen[1], Jillian Lloyd[2], Ashton Brooks[2]

[1]University of Tennessee Health Science Center, Knoxville, TN, [2]University of Tennessee Hea, Knoxville, TN, [2]University of Tennessee Medical Center, Knoxville, TN

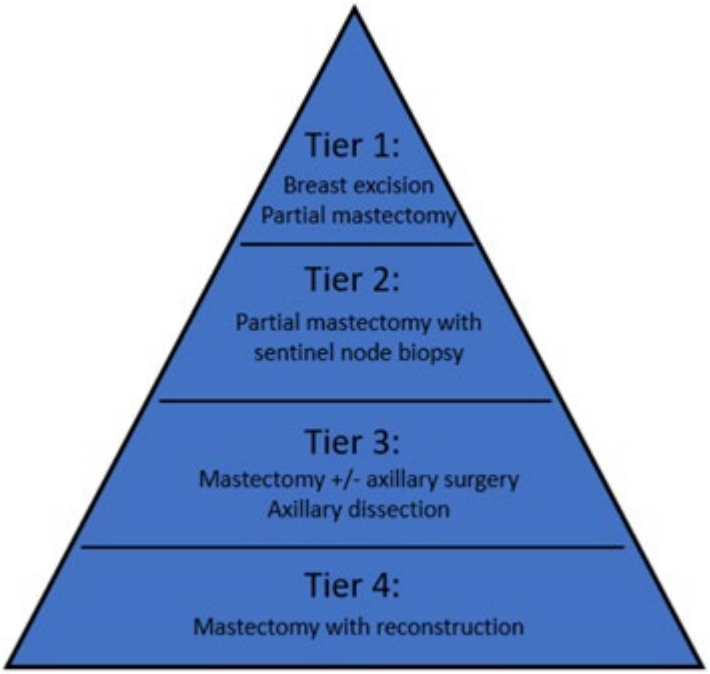
Background/Objective: The opioid epidemic has plagued the public health system in the United States for the last 20 years. Surgeons must balance inadequately controlled post-operative pain with overprescribing. Perioperative exposure to opioids is a gateway to subsequent opioid abuse with 91% of patients receiving opioid prescriptions after routine surgical procedures, and ~10% of opioid naïve cancer patients develop persistent opioid use. To help mitigate this issue, the Joint Commission has issued pain assessment and management standards for hospitals. These standards include physician and patient education as well as the establishment of pain management protocols. We have designed an observational Quality Improvement study to evaluate current prescribing practices for our breast surgeons and subsequent utilization of these medications for patients with breast disease undergoing surgical intervention with the ultimate goal of developing a standardized protocol to use in the peri-operative pain management of these patients.

Methods: In this prospective observational study, 115 participants were recruited among patients undergoing breast surgery secondary to benign or malignant breast disease at our institution from October 2022 thru October 2023. Participants completed a pain diary on their post-operative pain experience, including average pain scores and prescribed and/or used pain medications during their initial two-week post-operative period, including narcotic and non-narcotic pain medications. A total of 69 patients completed and returned the pain diary and were sorted into 'tiers' based on the type of surgical procedure they underwent (Figure 1). Total morphine milligram equivalents (MME) for medications prescribed and used were calculated. Mann-Whitney U test was used to calculate the statistical significance of the difference between MME prescribed and used for each tier and also by prescribing surgeon.

Results: The mean age of participants was 57.91 years. When stratified by tier, MME prescribed for participants was significantly greater than MME used by participants: Tier 1 ($N = 21$) means for MME prescribed and MME used were 43.33 and 7.8, respectively ($p < 0.01$); Tier 2 ($N = 20$) means were 52.62 and 18.29, respectively ($p < 0.01$); Tier 3 ($N = 14$) means were 83.93 and 32.86, respectively ($p < 0.01$); and Tier 4 ($N = 11$) means were 94.77 and 24.77, respectively ($p < 0.01$). MME used by participants were also significantly different between the two surgeons with the highest case load: Surgeon A ($N = 45$) means for MME used were 15.99, and Surgeon B ($N = 13$) means were 24.48 ($p < 0.01$).

Conclusions: This study shows that the mean MME prescribed is significantly higher than the mean MME used regardless of surgical tier, suggesting over prescription of opioids in the post operative setting for all patients undergoing breast surgery. Results show that Surgeon A's patients used significantly lower levels of MME than Surgeon B's patients. Given that Surgeon A incorporates multimodal pain medication and pre-operative education, this discrepancy highlights the impact that these interventions have on patient opioid use. These results convey the need for standardization of post-operative pain medication prescribing. More research must be conducted to determine which medication, dosage, and duration is best.

Figure 1. Breakdown of surgical procedures into tiers



1687527 – Same-day Discharges Among Elderly Mastectomy Patients: A Single Institution Prospective Study

Jessica Gooch[1], Qi Ying McClelland[2], Kathryn Paschalis[2], Jenna Dobbins[2], Allison Magnuson[2], Maya Anand[2], Kristin A Skinner[3], Ann Olzinski-Kunze[2], Anna Weiss[4]

[1]University of Rochester Medical Center, Pittsford, NY, [2]University of Rochester Medical Center, Rochester, NY, [3]James P Wilmot Cancer Institute - University of Rochester, Rochester, NY, [4]University of Rochester, Fairport, NY

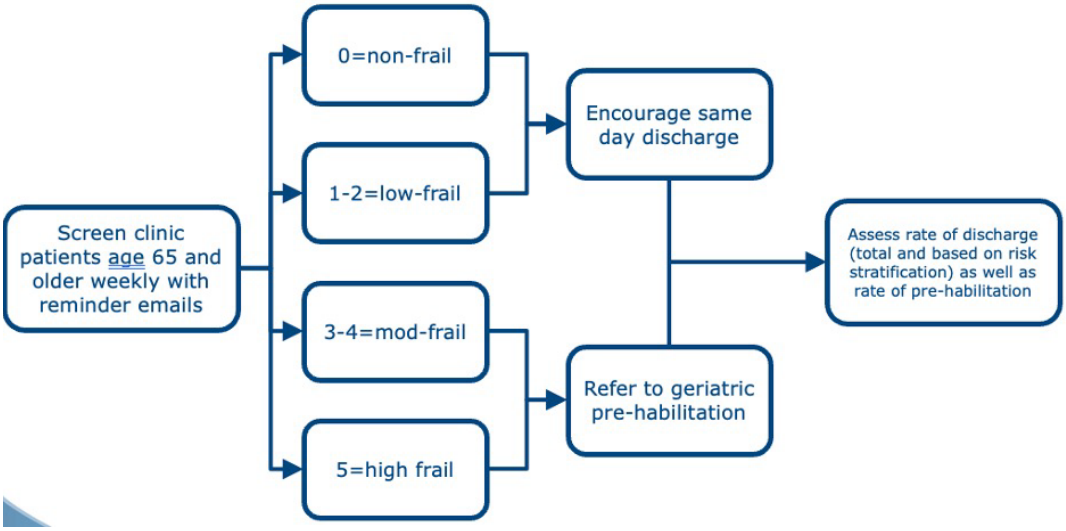
Background/Objective: Background: Same-day mastectomy has been proven safe and to be of higher value than inpatient. However, patients aged ≥65 years are still less likely to be discharged same-day compared to younger patients. Our aim was to implement a prospective, pragmatic screening protocol to increase the rate of same-day discharge among our elderly patients.

Methods: Methods: We conducted a prospective study of patients age ≥65 who planned to undergo unilateral or bilateral mastectomy for treatment of breast cancer. Eligible patients were first screened with the 5-factor modified frailty index (mFI-5) to assess for preoperative frailty. The mFI-5 is a simple chart review-based index derived from the presence of 5 co-morbid conditions. A score of 1-2 is considered low-frailty, 3-4 moderate, and 5 high-frailty. Notification of "frail" or "non-frail" status was sent to the surgeon by email prior to the patient's initial consultation visit. Patients with moderate to high frailty scores were highlighted, and geriatric oncology pre-habilitation prior to surgery was encouraged. See Figure 1 for study schematic. Chart reviews were conducted to collect demographic and clinicopathologic variables, to determine the date of discharge, and to record any postoperative complications in real time. The primary endpoint was same-day mastectomy discharge rate. From our institutional historic data (mastectomies performed March 2022-February 2023), 16/85 (18.8%) of mastectomy patients aged ≥65 years were discharged same-day. Sample size was calculated by a meaningful increase of same-day discharge, determined to be 20% by group consensus including patient advocate input. Our prospective rate was compared to our historic rate by Fisher's exact test for comparing two independent proportions.

Results: Results: From March 2023 to October 2023, 221 newly diagnosed cancer patients age ≥65 were screened. Median age was 72 years (range 65-99). Of these patients, 31 underwent mastectomy (14%). Frailty scores ranged from 0-4 with no patients scoring 5. Six patients (19.4%) had a score of zero, 23 (74.2%) had a score of 1 or 2, and 2 patients (6.5%) had a score of 3 or 4. Six patients were referred to geriatric oncology for pre-habilitation, 1 non-frail patient, 4 with low frailty, and 1 with moderate frailty. Median length of stay (LOS) was 1 day (range 0-21). Fourteen patients had a same-day discharge (45.2%), which was significantly higher than historic data ($p = 0.0075$).

Conclusions: Conclusions: After implementing our prospective protocol, we significantly increased same-day mastectomy discharges for patients ≥65 from 18.8% to 45.2%. This protocol included a simple chart-based frailty screening tool and a single weekly email reminder to providers. Future directions include increasing the proportion of patients who receive geriatric oncology pre-habilitation referrals to continue to increase our same day discharge rate, and evaluating patient reported outcomes using the Quality of Recovery (QoR-15) survey.

Figure 1: Schematic for screening and pre-habilitation referrals



1688608 - Quality of Life in Breast Cancer Survivors in the All Of Us Research Program

Anthony Baez[1], Zeynep Ozdemir[2], Matthew Sporn[3], Lindsay Chevlin[3], Alyssa Marmer[4], Charles Dimaggio[3], Freya Schnabel[4]

[1]NYU Grossman School of Medicine, Long Island City, NY, [2]Istanbul University Cerrahpasa - Cerrahpasa School of Medicine, New York, NY, [3]NYU Grossman School of Medicine, New York, NY, [4]NYU Perlmutter Cancer Center, New York, NY

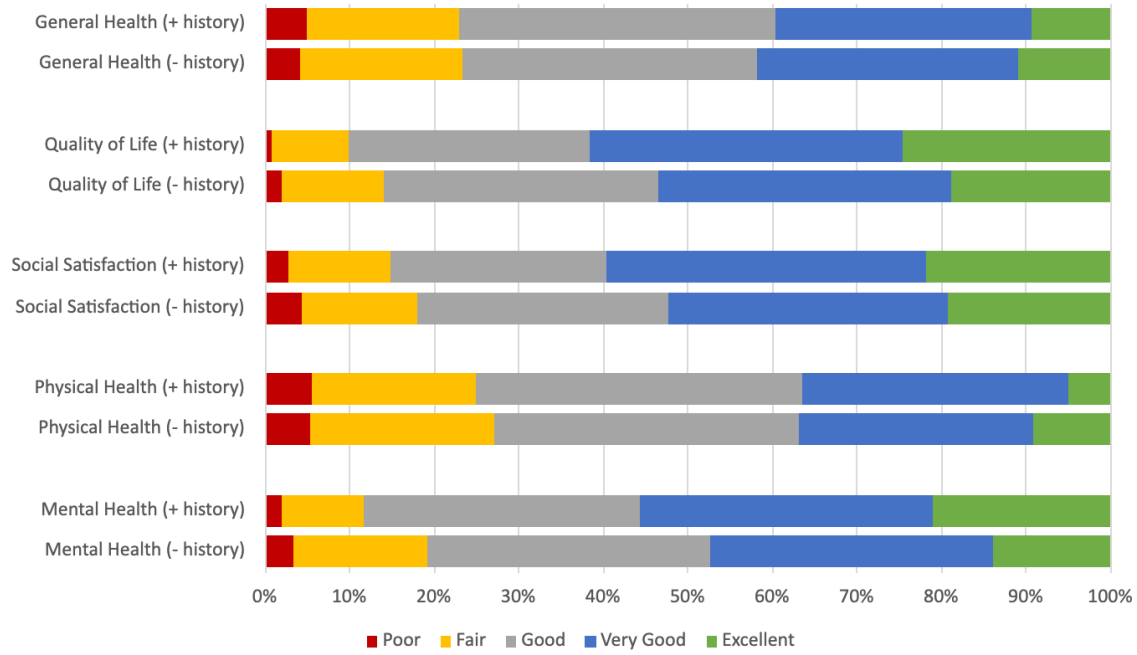
Background/Objective: The All of Us Research Program is a National Institutes of Health initiative aimed at gathering health information from over 1 million Americans, with an emphasis on enrolling historically underrepresented groups. This study was designed to compare self-reported quality of life measures in women with and without a history of breast cancer enrolled in this program.

Methods: The All Of Us database was queried for participants who self-reported as female at birth and completed the "Overall Health" survey and they were stratified based on breast cancer history. Statistical analysis included demographics and the Chi-square test to compare survey responses related to multiple health and quality of life factors.

Results: Of 248,844 participants who self-reported as female at birth, 9,135 (3.7%) had a history of breast cancer per electronic health record data. The mean age of participants with and without a history of breast cancer was 67.6 and 53.1 years respectively. 55.3% of unaffected women identified as White, 18.4% Black or African American, 3.5% Asian and the remaining did not specify or identified with a smaller racial group. 68.6% of those affected by breast cancer identified as White, 12.8% Black or African American and 2.4% Asian. 20.1% of unaffected women identified as Hispanic/Latino compared to 12.9% of those with a history of the disease. The Chi-square test revealed statistically significant differences in survey responses in the following categories: emotional difficulties including anxiety, depression or irritability ($p< 0.01$), social satisfaction ($p< 0.05$), quality of life ($p< 0.01$)), mental health ($p< 0.01$) and physical health (< 0.01). Women with a history of breast cancer had a higher proportion of "excellent" and "very good" health ratings compared to unaffected women in multiple domains including quality of life (61.4% vs 53.5%), social health (59.6% vs 52.3%) and mental health (55.6% vs 47.2%). 56.3% of affected women reported "never" or "rarely" experiencing emotional difficulties in the last 7 days compared to 48.0% of unaffected women. A higher proportion of unaffected women rated their physical health as "excellent" compared to those with a history of the disease (9.3% vs 4.9%).

Conclusions: Breast cancer survivors in the All of Us database reported superior emotional, social, and mental wellbeing compared to women unaffected by the disease. This may be attributed to advances in oncologic care, accessible survivorship resources, and an enhanced life perspective. This study involved a heterogeneous population; however, previous reports have identified specific disease and patient characteristics associated with quality of life in the survivorship period. This data supports ongoing efforts to support and improve quality of life for women with breast cancer through the continuum of their care. These are valuable considerations as we strive to promote physical, mental and social wellbeing in our diverse population of breast cancer survivors.

Figure 1: Quality of life survey responses in women with and without a history of breast cancer



1687976 - A Retrospective Cohort Study of the Effects of Pre-Operative Testosterone Use on Finding Atypia or Cancer on Surgical Pathology after Gender-affirming Mastectomy

Kathleen Stutz[1], Zilin Cui[2], Theo Eldor[3], Rachel Lister[3], Aixa Perez Coulter[4], Pranay Parikh[4], Jesse Casaubon[4]

[1]University of Massachusetts - Baystate, East Granby, CT, [2]UMass Memorial, Springfield, MA, [3]UMass Chan Medical School, Springfield, MA, [4]University of Massachusetts - Baystate, Springfield, MA

Background/Objective: There are around one million people in the United States who identify as transgender. For individuals seeking masculinization, testosterone is commonly used to aid in developing male secondary sex characteristics. Initiation of gender-affirming hormone therapy is associated with significant improvements to mental health and quality of life. Many individuals elect to have top surgery, or gender-affirming mastectomy (GAM). Recent clinical data supports a potential role for testosterone in breast cancer prevention in patients taking estrogen-based hormone replacement therapy. Testosterone inhibits estrogen-induced mammary epithelial proliferation and suppresses estrogen receptor expression. This alteration should effectively decrease rates of atypia and cancer. As of 2022, there were 38 cases of documented breast cancers in transmen. 14 (36.8%) were identified incidentally on pathology specimen after GAM This study aims to evaluate the influence of preoperative testosterone use on the rate of finding atypia or malignancy on surgical pathology after GAM.

Methods: An IRB reviewed and exempted retrospective cohort review was performed of adult transmasculine or non-binary patients who underwent GAM at a regional medical center between January 2010 and December 2021. Patients were identified using ICD-9, ICD-10 and CPT codes. Patients with previous radiation exposure or who had mastectomy performed for reasons other than gender affirmation were excluded. Cancer was defined as invasive ductal or lobular carcinoma, or ductal carcinoma in situ. Atypia was defined as flat epithelial atypia, atypical ductal or lobular hyperplasia, or lobular carcinoma in situ.

Results: 964 patients met inclusion criteria. 13 (1.3%) were found to have atypia and 2 (0.2%) were found to have cancer on final pathology. 750 patients (78.9%) used testosterone preoperatively. 100% of the patients diagnosed with cancer (2) and 54% of the patients diagnosed with atypia (7), used preoperative testosterone ($p< 0.05$). Testosterone use was associated with a lower risk of finding atypia ($P< 0.05$), yet this association did not hold true for finding cancer at time of surgery ($P=0.46$). Atypia was more common in older individuals (mean age 32.8 years with atypia vs 25.9 with, $P< 0.05$).

Conclusions: Gender-affirming mastectomy and hormone therapies are increasingly more common. Our data suggest that pre-operative testosterone use was protective against finding atypia on final surgical pathology of patients undergoing GAM, though does not appear to have an influence on finding cancer at the time of surgery. Both atypia and cancer were rare, as expected, which does limit the ability to evaluate. Age as a risk factor for the discovery of atypia is consistent with prior literature and knowledge that cancer is a disease of older individuals. Screening mammography is recommended for transgender patients over 40 who have breast tissue, but there are otherwise no formal pre-operative screening guidelines. We recommend considering pre-operative risk assessment to guide screening in patients under 40 undergoing GAM to guide use of sentinel lymph node biopsy, or injection of iron oxide at the time of their initial surgery.

1688081 - Assessing the Impact of the 2021 CMS Evaluation and Management Guideline Changes on Breast Surgery Documentation

Anna Levine[1], Jason Aubrey[1], Aghdas Movassaghi[2], Jessica Thompson[1], G. Paul Wright[1]

[1]Corewell Health - Michigan State University, Grand Rapids, MI, [2]Michigan State University College of Human Medicine, Grand Rapids, MI

Background/Objective: The management of breast conditions involves a multidisciplinary approach which results in a significant documentation and administrative burden for providers which is linked to increased burnout. In 2021, the Centers for Medicare & Medicaid Services (CMS) implemented changes to CPT evaluation and management (E/M) documentation guidelines for outpatient notes. To determine the appropriate level of service no longer requires history and physician exam but rather depends on medical decision making (MDM) or total time spent providing care to the patient. The goal of the change was to decrease administrative burden, need for audits, unnecessary documentation while ensuring the payment for E/M is resource based. We hypothesized that these changes would result in significant reduction in note character counts in the post-implementation time period.

Methods: A single center, retrospective review of a tertiary care center's breast surgery service in the outpatient setting between 2019 to 2022. During the examined time period the practice consisted of six breast surgeons and five advanced practice providers (APP). The pre-implementation group included calendar years 2019 and 2020 (PRE) and post-implementation group 2021 and 2022 (POST). Descriptive statistics will be calculated. Comparison between groups was completed with the Mann-Whitney U Test.

Results: A total of 38,948 notes were included, 18,120 (46.5%) in the PRE group and 20,828 (53.4%) in the POST group, respectively. Surgeons wrote 17,324 (44.4%) notes and APPs wrote 21,624 (55.6%) notes. The overall median character count of notes was significantly shorter in the POST group (7866 IQR: 4011 vs 4812 IQR: 3288, $p < 0.001$). The median note character counts decreased significantly for both surgeons (8554 IQR: 4165 vs 5135 IQR 3613, $p < 0.001$) and APPs (7319 IQR: 4324 vs 4578 IQR: 3225, $p < 0.001$) in the POST group. The median character note was significantly shorter for each individual surgeon and APP that was practicing in both cohorts (Table 1).

Conclusions: The implementation of the 2021 CMS evaluation and management guidelines for outpatient notes resulted in a significant reduction in note length for both surgeons and advanced practice providers. This reduced administrative load has the potential to reduce burnout.

Table 1: Individual providers pre- and post-implementation median character lengths

	Pre-implementation Median characters (IQR)	Post-implementation Median characters (IQR)	P-Value
Surgeons	8,554 (4,165)	5,135 (3,613)	< 0.001
Surgeon A	7,365 (4,095)	4,215 (2,850)	< 0.001
Surgeon B	8,856 (5,393)	6,849 (3,997)	< 0.001
Surgeon C	9,679 (4,078)	5,676 (3,109)	< 0.001
Surgeon D	8,140 (2,894)	3,871 (1,683)	< 0.001
APP	7,319 (4,324)	4,578 (3,225)	< 0.001
APP A	8,301 (3,219)	5,159 (3,097)	< 0.001
APP B	7,159 (7,486)	5,985 (2,180)	< 0.001
APP C	6,750 (3,813)	3,809 (2,333)	< 0.001
Overall	7,866 (4,011)	4,812 (3,288)	< 0.001

Table 1: Individual providers pre- and post-implementation median character lengths. IQR: Interquartile range.

1686117 - Longitudinal Trends in Patient-reported Outcomes in the First Year After Lumpectomy Versus Mastectomy

Sudheer Vemuru[1], Laura Helmkamp[2], Monica Adams[2], Kathryn Colborn[2], Hannah Parris[1], Victoria Huynh[1], Madeline Higgins[1], Nicole Christian[1], Gretchen Ahrendt[1], Erin Baurle[3], Clara Lee[4], Simon Kim[1], Dan Matlock[1], Ethan Cumbler[1], Sarah Tevis[1]

[1]University of Colorado School of Medicine, Aurora, CO, [2]University of Colorado Anschutz Medical Center, Adult and Child Center For Outcomes Research And Delivery Science, Aurora, CO, [3]University of Colorado Anschutz Medical Center, Aurora, CO, [4]University of North Carolina School of Medicine, Chapel Hill, NC

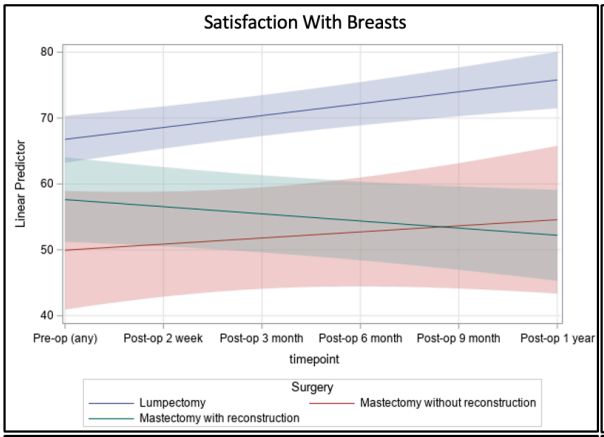
Background/Objective: Lumpectomy and mastectomy have comparable oncologic outcomes for patients with early-stage breast cancer. Compared to mastectomy, lumpectomy has been associated with superior quality of life among breast cancer patients as measured by patient-reported outcomes (PROs). However, it is unclear how PROs change longitudinally after surgery and during adjuvant treatments. In this study, we sought to compare trends in PROs among patients who underwent lumpectomy versus mastectomy over the first year after surgery.

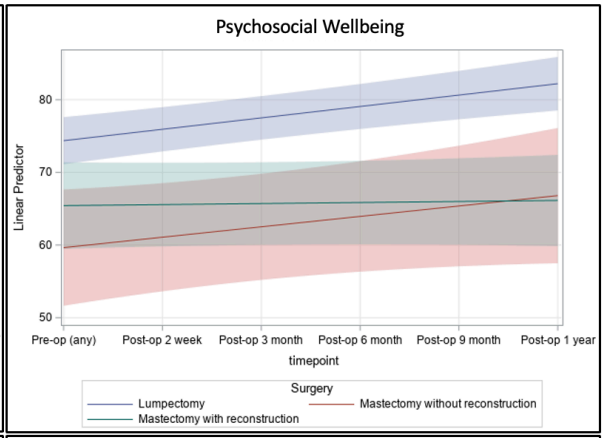
Methods: Newly diagnosed stage 0-III female breast cancer patients seen at an academic breast surgery clinic between June 2019 and March 2023 were invited to participate in a longitudinal PRO study. Patients who underwent a lumpectomy or a mastectomy with or without reconstruction were included in this analysis. Enrolled patients received the BREAST-Q preoperative module, a validated PRO tool measuring domains of wellbeing in breast cancer patients on a 0-100 scale with higher scores representing superior outcomes. The four domains analyzed were satisfaction with breasts, psychosocial wellbeing, physical wellbeing, and sexual wellbeing. Patients then received the BREAST-Q postoperative module gauging these domains at 3-month intervals for the first year after surgery. The primary outcomes were scores for each domain at each measured time point through the first year after surgery. Linear mixed models were used to estimate the change in PRO scores over time in the mastectomy and lumpectomy groups. The mastectomy cohort was separated by whether reconstruction was performed. Models were also adjusted for age and receipt of adjuvant therapies including chemotherapy, radiation, and endocrine therapy.

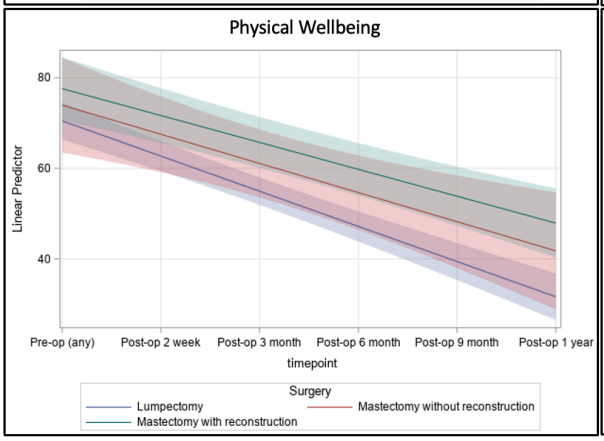
Results: The cohort included 339 patients, 202 who underwent lumpectomy and 137 who underwent mastectomy. Respective response rates for lumpectomy and mastectomy patients at each time point were: 68% and 67% prior to surgery, 58% and 53% at 3 months after surgery, 43% and 46% at 6 months after surgery, 39% and 44% at 9 months after surgery, and 33% and 37% at 12 months after surgery. Lumpectomy patients were older, more likely to receive adjuvant radiation and endocrine therapy, and less likely to receive adjuvant chemotherapy. Seventy-six percent of mastectomy patients underwent reconstruction. After adjusting for age, and receipt of adjuvant chemotherapy, radiation therapy, and endocrine therapy, we found that lumpectomy patients demonstrated greater increases in scores over time for satisfaction with breasts, psychosocial wellbeing, and sexual wellbeing compared to patients who underwent mastectomy with reconstruction (Figure 1). Patients who had mastectomy without reconstruction did not have significantly different trends in these domains over time compared to patients who had mastectomy with reconstruction. All groups showed similar declines in physical wellbeing over time.

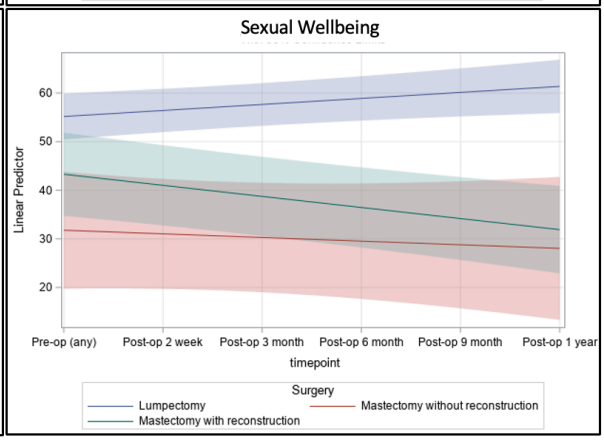
Conclusions: In this longitudinal cohort study, patients who underwent lumpectomy demonstrated greater improvements in satisfaction with their breasts, psychosocial wellbeing, and sexual wellbeing over the first year after surgery compared to patients who underwent mastectomy after controlling for relevant covariates. While further work is needed to corroborate these findings, the results of this study may help inform early-stage breast cancer patients making decisions about their surgical care.

Figure 1: Longitudinal trends in patient reported outcome scores in the first year after lumpectomy versus mastectomy with or without reconstruction. Shading represents the 95% confidence intervals.


Satisfaction With Breasts
Linear Predictor
80
70
60
50
40
Pre-op (any)
Post-op 2 week
Post-op 3 month
Post-op 6 month
Post-op 9 month
Post-op 1 year
timepoint
Surgery
Lumpectomy
Mastectomy without reconstruction
Mastectomy with reconstruction


Psychosocial Wellbeing
Linear Predictor
80
70
60
50
Pre-op (any)
Post-op 2 week
Post-op 3 month
Post-op 6 month
Post-op 9 month
Post-op 1 year
timepoint
Surgery
Lumpectomy
Mastectomy without reconstruction
Mastectomy with reconstruction


Physical Wellbeing
Linear Predictor
80
60
40
Pre-op (any)
Post-op 2 week
Post-op 3 month
Post-op 6 month
Post-op 9 month
Post-op 1 year
timepoint
Surgery
Lumpectomy
Mastectomy without reconstruction
Mastectomy with reconstruction


Sexual Wellbeing
Linear Predictor
60
50
40
30
20
Pre-op (any)
Post-op 2 week
Post-op 3 month
Post-op 6 month
Post-op 9 month
Post-op 1 year
timepoint
Surgery
Lumpectomy
Mastectomy without reconstruction
Mastectomy with reconstruction

1688559 - Enhanced Recovery After Surgery Protocol Implementation for Mastectomy Reduced Overall Length of Stay, Total Cost, and Opioid Use

Kathleen Ryan, Michelle Fillion, Aparajita Spencer

Novant New Hanover Hospital, Wilmington, NC

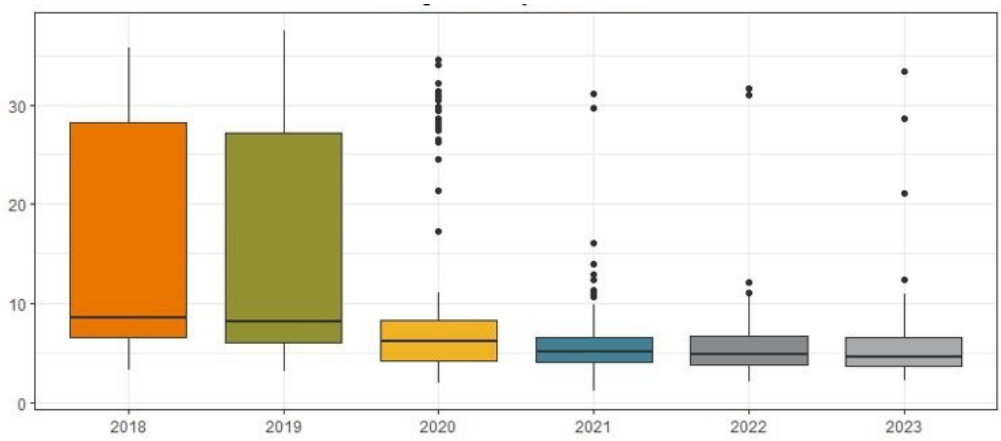
Background/Objective: ERAS official breast protocol was published in 2017, those recommendations were initiated at our hospital in 2020 with the purpose to provide improved post operative outcomes for the breast cancer patients undergoing mastectomy with or without reconstruction. The aim of the study was to evaluate outcomes of length of stay, total cost and opioid use prior to and post ERAS protocol implementation.

Methods: A retrospective review study was conducted utilizing a random sample of 1572 patients undergoing mastectomy with or without reconstruction at our large community hospital and outpatient surgery center between 2017 to 2023. The pre-ERAS group included patients from 2017-2019 to compare amongst the post-ERAS group from 2020-2023 with equally sized sample groups for analysis. Their median outcomes of length of stay, total cost and morphine milligram equivalents used from 0-3 hours post operatively were compared using Wilcoxon tests.

Results: Outcomes of 783 pre- and 789 post-ERAS protocol patients were compared. There were significant decreases in total costs ($5727.03 to 4512.31, $p< 0.001$), immediate post-operative morphine milligram equivalent administration (20.00 to 17.50, $p< 0.001$), and length of stay (8.72 to 5.22 hours, $p< 0.001$) as seen in the Table. There were far fewer overnight admissions, and there was a general shift to performing the same cases at the outpatient surgery center. There was no appreciable difference in outcomes comparing pre, during, and post COVID cases. There were no differences in measured adverse outcomes including 30-day re-admissions or emergency department visits.

Conclusions: The comparative results provide justification of the multi-disciplinary, facility and surgeons' implementation of the ERAS protocol showing benefits on post operative pain control, hospital stay and cost into the breast surgery practice in our region. Previous analysis of ERAS protocol in breast surgery at the region's facilities was reviewed in 2021, however this only concluded overall decrease in cost and did not evaluate length of stay or opioid use as this current review did. Future goals among this research will focus on further cost breakdown and length of stay at separate phases of care to illuminate discrepancies in hopes to maximize care but decrease charges and hospitalization time for patients.

Figure 1: Length of stay in hours comparison amongst years prior to and post-ERAS implementation



1618053 - Same-day Discharge After Mastectomy: A Single-institution Safety and Feasibility Study

Rachel Sargent, Daniel Choi, Beverly Tseng, Tiana Le, Varadan Sevilimedu, Monica Morrow, Laurie Kirstein

Memorial Sloan Kettering Cancer Center, New York, NY

Background/Objective: Same-day discharge after mastectomy [SDM] has been shown to be safe and feasible for patients meeting narrow eligibility criteria, including limits to patient age and distance from patients' homes to the hospital. Our institution embarked on a safety and feasibility study for an SDM pathway with expanded eligibility criteria, allowing nearly all patients to participate.

Methods: An SDM pathway was created around every touchpoint in the patient process to ensure proper education and expectations. Data were prospectively collected for all patients who underwent mastectomy (with or without reconstruction) at our 23-hour and ambulatory surgery centers from February 2022 to May 2023. Patient demographics (age, travel distance from home to surgery center, and identification and documentation of a caregiver) and treatments undertaken (history of neoadjuvant chemotherapy, type of surgery, and anesthesia) were compared for patients who underwent SDM to those who stayed overnight. Complications were then recorded for POD 0-1 for patients who were on the SDM pathway. Patient-reported outcomes were collected via the Recovery Tracker, an electronic platform with daily input by patients in the postoperative period, with nursing alerts available if triggered by the patient.

Results: Of 1664 patients, 84 (5%) patients elected for SDM while 1580 (95%) patients stayed overnight. Fifty-nine patients (3.5%) were initially planned to be on SDM pathway, and an additional 30 patients who were initially planned to stay overnight converted to the SDM pathway. Five patients planned for SDM were discharged the following day, all because of preference and not for medical reasons. Compared to admitted patients, SDM patients were significantly older (61 vs 51 years, $p< 0.001$), more likely to undergo unilateral mastectomy (70% vs 46%, $p< 0.001$), and less likely to undergo reconstruction (32% vs 74%, $p< 0.001$). SDM patients lived significantly farther away from the hospital (34 vs 28 miles, $p< 0.001$ (Table). On POD 0-1 the one complication for the patients on the SDM pathway was a takeback for a hematoma on the day of surgery, with the patient still being discharged on the same day. There were no ER visits, transfers, or admissions. Per the Recovery Tracker, 3 SDM patients requested a nurse phone call.

Conclusions: SDM is safe and feasible even with an expanded criteria for patient eligibility without significant differences in immediate perioperative complications. Selection and inclusion should not be limited by age, type of surgery, or distance from the hospital. Rather, patient motivation, clear expectation-setting by the clinical team, and presence of a caregiver are relevant considerations.

Table 1. Same-day mastectomy and admitted patients characteristics. Abbreviations: SDM, same-day discharge after mastectomy

	SDM (n=84)	Overnight (n=1580)
Unilateral (n=789)		
Reconstruction	14 (17%)	428 (27%)
No Reconstruction	45 (54%)	302 (19%)
Bilateral (n=875)		
Reconstruction	13 (15%)	735 (47%)
No Reconstruction	12 (14%)	115 (7%)

1673384 - Impact of Text Messaging Communications on Mammogram Scheduling Outcomes: Three Phases Pilot Study of an Overdue Screening Mammogram Campaign

Hassan Masoudpoor[1], Kimeta Palamar[2], Christine Weiselberg[3], Cody Weber[3], Mindy Goldfischer[3], Rachelle Leong[3], Jenna Gillen[3]

[1]Englewood Health, Hackensack Meridian Health Palisades Medical Center, Englewood, NJ, [2]Englewood Hospital, Englewood, NJ, [3]Englewood Health, Englewood, NJ

Background/Objective: Breast cancer, the second most prevalent and lethal cancer among U.S. women, requires effective screening strategies for early detection and improved patient outcomes. Patients at our facility typically rely on MyChart notifications and mailed letters as reminders for upcoming mammogram screenings, often due within 30 days. To enhance the uptake of breast cancer screening mammograms, our institution has implemented a program that uses two-way text message (SMS) reminders for patients who are overdue for their screening imaging. This campaign emphasizes the importance of community outreach in addressing the gaps in overdue mammogram screenings, especially in the wake of the COVID-19 pandemic, which has significantly impacted annual mammogram screening numbers. The importance of early detection, a fact underscored by numerous studies, is the driving force behind this initiative. This report aims to analyze the impact of these SMS-reminders on improvement of patient medical compliance and appointment reminders.

Methods: We conducted a retrospective, single-institution, multisite pilot study on women who were overdue for mammograms within our institution, excluding males, those with previous bilateral mastectomies, deceased patients, individuals with pre-scheduled breast imaging appointments, and those diagnosed with breast cancer. Eligible patients received a two-way SMS in three phases, allowing self-scheduling of appointments and reminders for overdue mammograms. We calculated the number of patients who responded to the SMS and scheduled appointments, including mammogram screening, other breast imaging types, biopsy requirements, and cancer detection rates, two months after each phase.

Results: In Phase 1 of the study, 5,975 out of 6,069 eligible patients received an SMS, while 93 patients with delivery failures were contacted via automated phone calls. The average patient age was 59.6 years (SD ± 11.5). The three most common languages spoken by the patients were English (88.3%), Spanish (7.7%), and Korean (1.4%). The patient population included White (59.7%), Black/African American (11.1%), Korean (4.0%), Chinese (2.1%), other Asians (16.9%), Hispanic (3.4%), and others (2.7%). After two months, 1,027 patients (16.9%) scheduled appointments, with approximately 40% self-scheduling their mammograms through the SMS link. In Phase one, 59 patients (5.7%) required appointments for breast imaging other than routine mammograms. The cancer detection rate was 0.6%, and 8 out of 1,027 patients (0.8%) required a biopsy. In the second phase, out of 531 patients, 175 (33%) scheduled a screening mammogram or other types of breast imaging. The cancer detection rate was 0.6%, and two patients (1.1%) required surgical excision. In Phase 3, 174 out of 542 patients (32%) responded to the text messages and were scheduled for breast imaging. Only two patients required a biopsy, and both were reported as benign.

Conclusions: The study shows that two-way SMS communication may be a promising intervention in increasing the uptake of screening mammograms especially in patients who are overdue for their screening imaging. This indicates digital outreach, including SMS reminders, could enhance early diagnosis and patient results in conditions like breast cancer, which necessitates further research.

Table 1: Breast imaging schedule, cancer detection, and biopsy requirements

		Phase 1	Phase 2	Phase 3	All Phases
Total scheduled for breast imaging including routine screening mammogram		1027/6069 (16.9%)	175/531 (33%)	174/542 (32.1%)	1376/6069 (19.2%)
Scheduled for screening mammogram	Completed	840 (81.8%)*	132 (75.4%)	137 (78.7)	1109 (80.6%)
	Upcoming appointment	50 (4.9)	28 (16%)	28 (16.1%)	106 (7.7%)
	Canceled	60 (5.8%)	3 (1.7%)	5 (2.9%)	68 (4.9%)
	No-shows	18 (1.8%)	3 (1.7%)	1 (0.6%)	22 (1.6%)
Scheduled for imaging other than a routine breast mammogram	Completed	49 (4.8%)	9 (5.1%)	6 (3.4%)	64 (4.7%)
	Upcoming appointment	3 (0.3%)	0	0	3 (0.2%)
	Canceled	2 (0.2%)	0	0	2 (0.1%)
	No-shows	5 (0.5%	0	0	5 (0.4%)
Cancer detection rate		6/1027 (0.6%)	1/175 (0.6%)	0/174 (0%)	7/1376 (0.5%)
Required needle biopsy		12 (1.2%)	4 (2.3%)	2 (1.1%)	18 (1.3%)
Required surgical excision		8 (0.8%)	2 (1.1%)	0	10 (0.7%)
* Percentage calculated among all the scheduled patients					

1688027 - Post-mastectomy Emergency Department Visits in Alberta: Understanding Patient Perspectives

Emily Heath, Julia Chai, Susan Isherwood, Riley Martens, May Lynn Quan

University of Calgary, Calgary, AB, Canada

Background/Objective: Same day surgery (SDS) for mastectomy increased in Alberta from 1.7% to 73% in 2022, after implementation of a perioperative care pathway in 2016. However, unplanned visits to the emergency department (ED) remained high at 22-27% with < 5% requiring readmission. Our group previously explored reasons for post-mastectomy ED visit using administrative data but lacked patient-level data. Our current study aims to explore patient-reported factors associated with unplanned ED visits after mastectomy by 1) describing patients with unplanned ED visits within 30 days of mastectomy in a recent cohort, and 2) exploring characteristics of unplanned ED visits from the patient perspective.

Methods: A survey study was conducted of patients who underwent a mastectomy in Alberta between 07/01/2021 to 06/30/2022 by a general surgeon, and had an unplanned ED visit within 30 days. Patients were identified from the CIHI database; chart review was performed to confirm ED visit details. Patients were excluded if their presentation was unrelated to surgery, or if they were deceased at time of study. Survey questions evaluated 3 domains: medical, socioeconomic, and psychologic, as well as patient-reported experiences of perioperative care.

Results: Of 549 patients who underwent mastectomy during the study period, 132 (24%) presented to ED within 30 days. The survey was sent to 87 patients meeting inclusion criteria; 38% responded. Characteristics of patients and treatments are shown in table 1. Respondents had an average age of 56. Most had no comorbidities or 2+ comorbidities, and the majority had prior surgery. They were, on average, well educated and of higher socio-economic status. Patients underwent a range of treatments for breast cancer including neoadjuvant chemotherapy, sentinel lymph node biopsy, axillary dissection, concurrent reconstruction, and mastectomy alone. Most patients had 2+ operative drains. Patient-reported details surrounding ED visit are reported in Table 1. Many patients presented on a weekend, most stating that the ED was the only choice available at the time. Comparatively, others reported being told to go, or personally felt the ED was the best place for their problem. Patients were seen by an ED physician, nurse and/or surgeon. Most common reasons for ED visit were infection and drain concerns. Re-admission and operation rates were 25% and 19%, respectively. Overall, 84% felt prepared for surgery; only 15% felt uncomfortable with drain management. Patients identified peer support and wound information as areas lacking. While 78% of patients were mostly or very satisfied with surgery, difficulty accessing their surgical team post-operatively was reported as the main flaw.

Conclusions: Characteristics of patients in our study cohort are similar to those of patients who underwent mastectomy in previous years. Patients identified infection and drain concerns as the most common reason for unplanned ED visit after mastectomy. Overall, patients were satisfied with education and surgical care, but identified problems with accessing medical/surgical care after discharge, leading to sometimes unnecessary visits to the ED. Future initiatives should focus on improved access to outpatient care, and education on post-mastectomy emergencies.

Table 1. Characteristics of patients who had post-mastectomy ED visit, treatments for breast cancer, and details surrounding emergency department visit

Characteristic	Category	Total N
Patient Characteristics		
Age	Average	56 (32-87)
Comorbidities	Asthma	6 (18%)
	Autoimmune disorder	6 (18%)
	Diabetes	0 (0%)
	COPD	7 (21%)
	Heart condition	2 (6%)
	Hypertension	7 (21%)
	None	10 (30%)
	Other	8 (24%)
	2+ comorbidities	9 (27%)
Prior Surgery	No prior surgery	5 (15%)
	1 surgery	7 (21%)
	2 surgeries	6 (18%)
	3+ surgeries	15 (45%)
Education Level	Did not graduate high school	3 (9%)
	High school graduate	4 (12%)
	2-4 year post-secondary degree	20 (60%)
	More than 4-year post-secondary	5 (15%)
	Prefer not to answer	1 (3%)
Annual Household Income	$20-60,000	5 (15%)
	$60-80,000	3 (9%)
	$80-100,000	6 (18%)
	>$100,000	11 (33%)
	Prefer not to answer	8 (24%)
Treatment Characteristics		
Type of Treatment	Neoadjuvant chemotherapy	8 (24%)
	Sentinel lymph node biopsy	13 (39%)
	Axillary dissection	4 (12%)
	Concurrent reconstruction	8 (24%)
	Mastectomy alone	9 (27%)
Number of Operative Drains	0	1 (3%)
	1	9 (27%)
	2	15 (45%)
	3+	8 (24%)
Emergency Department Visit Characteristics		
Day of Week	Weekday (Monday-Thursday)	3 (9%)
	Friday	2 (6%)
	Saturday	5 (16%)
	Sunday	5 (16%)
	Don't recall	16 (50%)
Healthcare Providers Seen	Emergency physician	28 (88%)
	Nurse	13 (40%)
	Surgical team	9 (28%)
Reason for Choosing ED	I thought ED was best place for my problem	5 (16%)
	I was told to go to ED	7 (22%)
	ED was most convenient place	2 (6%)
	ED was the only choice available at the time	13 (42%)
	Other	4 (13%)
Reason for ED visit	Infection	12 (38%)
	Pain	7 (22%)
	Bleeding/Hematoma	7 (22%)
	Wound concerns	8 (25%)
	Drain concerns	12 (38%)
	Other	7 (22%)
Outcome of ED Visit	Re-operation	6 (19%)
	Re-admission	8 (25%)

1688606 - Immune Phenotypes Predict the Effect of Adjuvant Radiation Therapy in Early-stage Breast Cancer

Troy Bremer[1], Karuna Mittal[1], Chirag Shah[2], Frank A Vicini[3], Naamit Gerber[4], Melissa Krystel-Whittemore[5], Clayton Yates[6], Balasubramanyam Karanam[7], Elizabeth Pernicone[8], Melissa Tempest[9], Geza Acs[10], Charles Cox[11], Steven Shivers[1], Charlotta Wadsten[12]

[1]PreludeDx, Laguna Hills, CA, [2]Cleveland Clinic, Cleveland, OH, [3]Michigan Healthcare Professionals, MI, [4]NYU Grossman School of Medicine, New York, NY, [5]NYU Langone Health, New York, NY, [6]Johns Hopkins School of Medicine, Baltimore, MD, [7]Tuskegee University, Tuskegee, AL, [8]Saint Francis Medical Center, Peoria, IL, [9]USF/TGH, Tampa, FL, [10]AdventHealth, Tampa, FL, [11]University of South Florida Morsani College of Medicine, Tampa, FL, [12]Sundsvall Hospital, Umeå University, Sweden, Sundsvall, Vasternorrlands Lan, Sweden

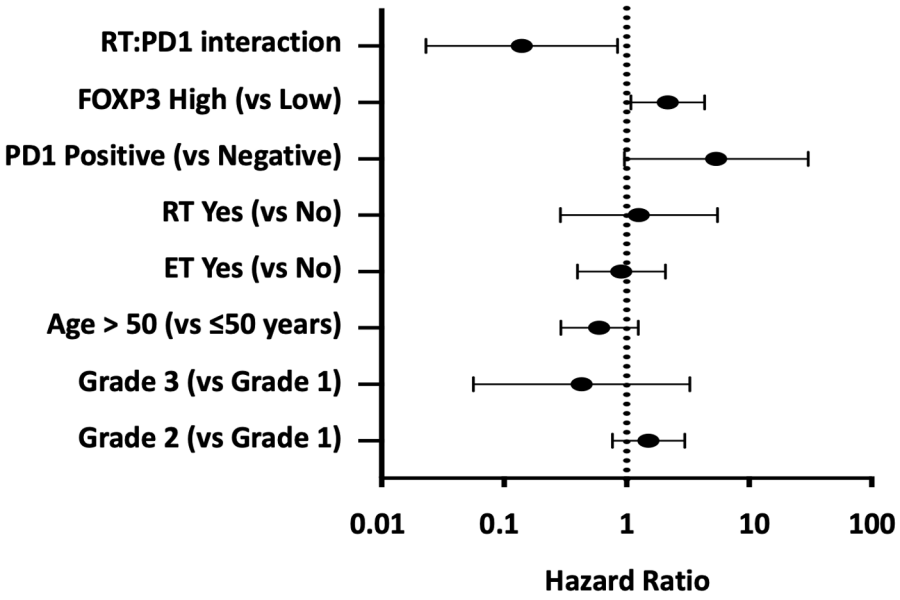
Background/Objective: Radiation therapy (RT) is a standard treatment for early-stage, hormone receptor-positive, invasive breast cancer (BC) following breast-conserving surgery (BCS). Current RT recommendations rely on clinicopathologic (CP) factors, including tumor size, nodal status, and histological grade. While CP factors provide valuable prognostic insights, their utility to assess RT benefit is limited. Ongoing studies are exploring the potential of integrating clinical and biological factors to effectively identify patients' recurrence risk profile with and without RT. However, the underlying biology of invasive breast cancer is intricate, as the tumor microenvironment plays a pivotal role in shaping the disease's biology and ultimately impacting treatment response. In this study, we aimed to evaluate the role of immune phenotypes as predictive markers for RT response as part of a biosignature for hormone receptor-positive invasive breast cancer patients.

Methods: 428 patients diagnosed with T1/T2N0M0 breast cancer who underwent BCS with negative margins were included. 334 patients were treated with BCS plus RT (median dose 50Gy) based on physician preference and 94 patients were only treated with BCS. Biomarkers were assayed in formalin-fixed paraffin-embedded tissue microarrays or whole sections using multiplex immunofluorescence and multi-spectral imaging in a CLIA lab (Laguna Hills, CA). Immune phenotypes were defined using biomarkers CD8, FOXP3 and PD1. Varied immune phenotypes were categorized into different risk groups and were analyzed for the rate of ipsilateral breast recurrence (IBR) using Cox proportional hazards. Risk group prognosis and RT prediction were assessed for RT-risk group interaction in multivariable analysis, adjusting for grade, age, and endocrine treatment.

Results: Patients with high levels of stromal CD8 (n=313) tended to show risk reduction after RT (BCS+RT n=243). Importantly patients with high stromal CD8 expression and high stromal FOXP3 expression (CD8High/FOXP3High) demonstrated increased rates of 10-yr IBR (HR=1.95, 95%CI 1,3.8) with and without RT. In a multivariable analysis of patients with CD8High expression, including grades (2 and 3), age (>50 years), endocrine treatment, PD1 expression, and RT, patients with high FOXP3 expression had an increased risk of recurrence with and without RT (HR=2.2, 95%CI 1,4.3). In addition, patients with PD1 expression trended (p=0.055) towards a higher risk of 10-yr IBR (HR=5.4, 95% CI .96,30) and preferentially benefited from RT (RT: PD1 interaction HR=0.13, 95%CI 0.02,0.84). Of the patients with higher expression CD8High who were treated with BCS plus RT, patients with the molecular subtype (CD8High/FOXP3High/PD1Neg) had significantly higher 10-yr IBR rates (HR=2.5, 95%CI 1.1,5.9).

Conclusions: In line with previously published data on immune phenotypes from the SWEBCG91 trial, our data confirmed that in the subset of the patients with high CD8 expression, the immune phenotype (CD8High/FOXP3High) had increased 10-yr IBR risks with and without RT. However, our study further stratified the (CD8High) population, identifying a Residual Risk subtype CD8High / FOXP3High/PD1Neg (those patients with higher risk remaining after BCS plus RT). Collectively, immune phenotypes improved the identification of patients' recurrence risk after BCS and can potentially aid in personalizing treatment options for patients with early-stage breast cancer.

Figure 1: Forest plot - patients treated with BCS ± RT with high CD8 expression


RT:PD1 interaction
FOXP3 High (vs Low)
PD1 Positive (vs Negative)
RT Yes (vs No)
ET Yes (vs No)
Age > 50 (vs ≤50 years)
Grade 3 (vs Grade 1)
Grade 2 (vs Grade 1)
0.01
0.1
1
10
100
Hazard Ratio

1608989 - Breast Radiation Exposure and Breast Cancer in Healthcare Workers: A Method for Risk Reduction

Lauren Westcott, Chet Rees, Gerald Ogola

Baylor University Medical Center, Dallas, TX

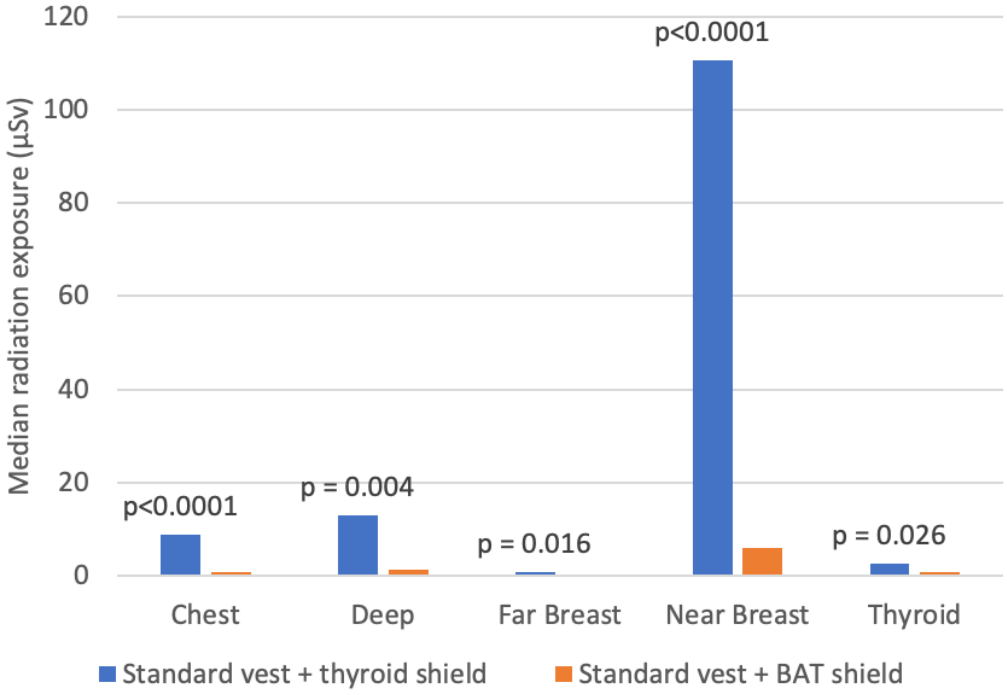
Background/Objective: Breast tissue is sensitive to the carcinogenic action of radiation and radiation exposure has been linked to breast cancer. Higher rates of breast cancer are observed in radiologic technologists as well as in orthopedic surgeons, with up to a 2.9-fold increase in prevalence when compared with women of a similar demographic. The standard lead vest does not adequately protect the upper outer quadrant of the breast, the most common site of breast cancers. The purpose of this study was to test a novel lead shield designed to protect the breast, axilla, and thyroid (BAT) from radiation exposure.

Methods: Testing was performed in a fluoroscopic procedure room using an anthropomorphic phantom with female torso, neck, and head to simulate the operator. Dosimeters were placed on the outer quadrant of each breast, the chest, the thyroid, and deep inside of the phantom in the approximate location of simulated spinal hematopoietic tissue. Standard lead vest plus thyroid shield with 0.50mm Pb equivalence was used as control and compared to standard lead vest plus BAT shield. Two image receptor positions (anterior-posterior and cross table lateral) and three operator positions were tested. Radiation exposure levels were recorded. Data analysis was performed with R version 4.0.3 statistical software. All statistical tests were two-sided with statistical significance level set at p values < 0.05.

Results: The breast nearest the radiation source ("near breast") received the highest radiation exposures, with a median of 110.5 microSv. When compared to standard protection, the BAT shield significantly reduced radiation exposure for all anatomic areas (Figure 1). For the near breast, the average radiation reduction among all operator positions was 91% ($p < 0.0001$). Reductions for far breast, chest, thyroid, and deep tissues were 76% ($p=0.016$), 94% ($p< 0.0001$), 52% ($p=0.026$), and 60% ($p=0.004$) respectively. Depending on operator position, the near breast had radiation exposure reductions ranging from 71.4% to 97.7%. The 97.7% reduction was noted in the position with operator 90° to table using cross table lateral beam. Exposures across all operator positions were considerably higher for cross table lateral beam projection. In all anatomic locations, the reductions in exposure when BAT was used compared to standard protection were significant, ranging from 34.6% for deep tissues to 100% for far breast.

Conclusions: The standard radioprotective vest leaves the lateral breast and axilla vulnerable to scatter radiation projecting upward from the radiation source. When compared to other anatomic locations, the breast nearest the radiation source experienced the highest radiation exposures in all tested operator positions. The BAT shield met study aims by significantly reducing radiation exposures to the breast, chest, thyroid and deep hematopoietic tissues when compared to standard protection. Occupational radiation exposure has been linked to breast cancer and other cancers including leukemia and lymphoma. These findings are important for healthcare workers to reduce the risk breast cancer and other radiation-associated cancers, especially in the era of highly prevalent non-invasive interventional medical therapies and involvement by women.

Figure 1. Median radiation exposure (microSv) for each anatomic location in all scenarios



1684697 – Long-term Follow-up in Breast Cancer Patients Treated with Post-lumpectomy Intracavitary Brachytherapy

Kendra Grundman[1], Ashlee Rice[2], Lina Sizer[2], Catherine Carruthers[2], Eunice Shin[2], William Carter[2]

[1]Mainline Health System, Manayunk, PA, [2]Mainline Health System, Bryn Mawr, PA

Background/Objective: Intracavitary brachytherapy has been used as a form of localized accelerated partial-breast irradiation (APBI) in order to provide directed radiotherapy to the tumor bed and as a means to limit logistical and economical constraints of the patient. The American Society for Radiation Oncology (ASTRO) and American Brachytherapy Society (ABS) have demonstrated the effectiveness and safety of APBI as being comparable to that of whole breast irradiation (1). Most of these studies use a 5 year follow up and there are few studies showing long term outcomes using intracavitary brachytherapy. The purpose of this study is to report the long-term outcomes of patients that were treated with post lumpectomy intracavitary brachytherapy.

Methods: Retrospective review of breast cancer patients at a single institution who underwent intracavitary brachytherapy status post lumpectomy between the years 2004 and 2010 using the electronic medical records and breast tumor registry. Standard descriptive statistics were used. Two sample t-tests and chi-square test of independence to compare continuous and categorical variables between those with and without a recurrence.

Results: A total of 527 patients were treated with intracavitary brachytherapy between 2004-2010. 126 (23.9%) patients were excluded from the study due to incomplete charts or lost to follow up. The mean follow up was 12.9 years (0.05 - 22.38 years, 95% CI 0.41) and the average age was 65 years. Ninety-six (23.9%) patients were diagnosed with recurrent or new breast cancers, with three (0.07%) patients having reported two or more new breast cancers. Fifty-two (12.7 %) had local recurrence, 15 (3.7%) regional recurrences, 15 (3.7%) were distant, and 17 (4.2%) were diagnosed with a new breast cancer. The average time of recurrence from intracavitary brachytherapy balloon removal was 7.4 years (4.8 SD). Larger tumors (1.2cm vs 0.9cm, 0.7 SD, $p < 0.05$) were more likely to recur.

Conclusions: Long term follow up of patients treated with intracavitary brachytherapy post lumpectomy at our institution revealed a higher recurrence rate than previously reported data. In our series, the mean breast cancer recurrence was 7.4 years. Overall, the ipsilateral in-breast recurrence (IBR) of 12.7% with intracavitary brachytherapy remains below the standard set by NSABP B-06 long-term follow up data. This revealed an IBR rate of 14.3% over 20 year follow up, with 60.3% IBR occurring after 5 years. Intracavitary brachytherapy could be considered as an alternative treatment without increasing IBR with consideration of tumor size. Further research comparing external beam partial breast radiation to intracavitary brachytherapy would be required to directly compare partial breast irradiation techniques.

1684732 - Complications and Patient Reported Outcomes of Mastectomy vs Partial Mastectomy for Patients Previously Augmented with Implants

Meredith Whittaker[1], Anna Stachura[2], Justin Turcotte[1], Sammi Scarola[1], Sean Miller[3], Shivani Badve[1], Laura Martino[1], Tripp Holton, III[4], Meghan Milburn[1], Rubie Jackson[1]

[1]Anne Arundel Medical Center/Luminis Health, Annapolis, MD, [2]Uniformed Services University / Walter Reed National Military Medical Center, Bethesda, MD, [3]Anne Arundel Medical Center/Luminis Health, Notre Dame, IN, [4]Annapolis, MD

Background/Objective: Although many surgeons favor partial mastectomy (PM) over mastectomy for small tumors in the absence of a genetic mutation, PM presents unique challenges in patients after prior breast augmentation with implants. Since radiation will be given more often after PM than after mastectomy, mastectomy may not present the same challenges. Several small studies have documented capsular contracture, poor cosmetic result, and implant losses among patients undergoing PM in the setting of prior augmentation. Our study aimed to directly compare outcomes after PM versus mastectomy in the setting of prior augmentation, and also evaluate patient reported outcomes (PRO) in this setting using the validated BREAST-Q scale.

Methods: This was a retrospective chart review, with a linked prospective questionnaire (BREAST-Q), of patients who underwent breast surgery for treatment of breast cancer at our institution from 2014-2022. Eligible patients were those with prior breast augmentation (implants in place) at the time of breast cancer diagnosis, who underwent PM or mastectomy with reconstruction. PM patients were excluded if they had PM and the implant was removed and not replaced/exchanged. BREAST-Q modules were administered electronically to patients who provided verbal consent via telephone encounter, and responses were linked to patient data. Univariate analyses were performed to compare patient and surgery characteristics and outcomes between groups. A subgroup analysis of patients responding the BREAST-Q was performed. Statistical significance was defined as $p< 0.05$.

Results: 49 patients (PM n=28, Mastectomy n=21) were included in the study. Eleven patients (PM n=4, Mastectomy n=7) responded to BREAST-Q (overall response rate 22%). All demographics and comorbidities were similar between groups with the exception of ASA score of 3+ (PM: 32% vs. Mastectomy: 0%, p=0.006) and hypertension (PM: 39% vs. Mastectomy: 10%, p=0.02). Treatments were also similar between the groups with the exceptions of higher rates of postoperative XRT (74.1 vs. 28.6%, p=0.002) and lower rates of expander placement (0.0 vs. 57.1%, p=0.006) in the PM group. Postoperatively, mastectomy patients experienced higher rates of overall complications and revisions > 90 days after index surgery (Table). The top indication for revision at >90 days was cosmetic (24% of mastectomy patients). No significant differences were observed in rates of acute or chronic seroma, hematoma, skin or nipple ischemia, surgical site infections, 30-day reoperations, or capsular contracture between groups. In the subset of patients completing the BREAST-Q survey, trends were observed towards better PRO in the mastectomy group, but the groups were too small for statistical comparisons.

Conclusions: This study is the first to directly compare outcomes between PM and mastectomy for breast cancer patients with prior breast augmentation. Notably, surgical revision > 90 days after index surgery were substantially and significantly higher in the mastectomy group, despite higher rates of radiation in the PM group. Though more work remains to be done, these findings can inform patients and their clinicians about expected outcomes of mastectomy vs PM in the setting of prior augmentation and further support shared decision making in clinical practice.

Table 1. Complications for the overall cohort (top half), and BREAST-Q responses for the responding sub-cohort (bottom half). Complications are given as n (%). BREAST-Q values are presented as Median (interquartile range). *Fisher's exact test.

Overall Cohort	PM (n=28)	Mastectomy (n=21)	p-value
Any complication	6 (21.4)	11 (52.4)	0.024
Acute Seroma	3 (10.7)	1 (4.8)	0.625*
Chronic Seroma	0 (0.0)	1 (4.8)	0.429*
Hematoma	0 (0.0)	2 (9.5)	0.179*
Skin/Flap Ischemia	0 (0.0)	3 (14.3)	0.072*
Nipple Ischemia	2 (7.1)	1 (4.8)	1.000*
SSI	3 (10.7)	4 (19.0)	0.443*
Incisional Dehiscence	0 (0.0)	5 (23.8)	0.011*
30 Day Reoperation	2 (7.1)	4 (19.0)	0.381
>90 Day Revision	1 (3.6)	7 (33.3)	0.015*
Capsular Contracture	7 (25.0)	5 (23.8)	0.924
BREAST-Q Subset	PM (n=4)	Mastectomy (n=7)	Reference Range
Satisfaction w/Breasts – Transformed Score	51.5 (27.5-67.3)	71.0 (59.0-100.0)	0-100
Physical Wellbeing – Transformed Score	45.0 (36.0-60.8)	100.0 (76.0-100.0)	0-100
Satisfaction with Implants – Raw Score	6.0 (4.0-8.0)	N/A	2-8
Rippling of Implants – Raw Score	N/A	6.0 (6.0-8.0)	2-8
Animation Deformity – Transformed Score	N/A	100.0 (64.0-100.0)	0-100
Adverse Effects of Radiation – Transformed Score	5.5 (0-23.5)	N/A	0-100

1685123 - Surgical Outcomes of Chest Wall Perforator Flaps in Partial Breast Reconstruction in a Developing Country

Nifasat Farooqi[1], Muhammad Zulqarnain Chaudhry[2], Asad Parvaiz[2], Areej Habib[2], Barka Sajjad[3]

[1]Shaukat Khanum Cancer Memorial Hospital and Research Center Lahore, Swabi, North-West Frontier, Pakistan, [2]Shaukat Khanum Cancer Hospital and Research Centre Lahore, Lahore, Punjab, Pakistan, [3]SKM, Lahore, Punjab, Pakistan

Background/Objective: Perforator flaps are one of the volume replacements oncoplastic techniques that can be used after Breast-conserving surgery (BCS) to reconstruct challenging defects in a relatively large tumor-to-breast ratio and to decrease the morbidity compared with the Latissimus dorsi flap. Although described more than a decade ago, these have not been adopted widely in clinical practice. We report on short-term surgical outcomes of partial breast reconstruction using chest wall perforator flaps.

Methods: This was a retrospective cohort study of patients who undergone BCS and partial breast reconstruction using anterior intercostal artery perforator or lateral thoracic artery perforator flaps from May 2022 to March 2023 at Shaukat Khanum Cancer Memorial Hospital and Research Center, Pakistan. The tumor excision with perforator flap reconstruction was done as single stage procedure as day case or as inpatient by trained breast surgeons. Patient characteristics, treatment details, and surgical outcomes at 6 weeks were observed. Specific outcomes recorded were margin re-excision and complication rates and cosmesis.

Results: Fifty-four patients underwent the procedure in the given study period. 45 (83.3%) patients underwent Lateral intercostal artery perforator flaps (LICAP) and 9 (16.7%) patients had anterior intercostal artery perforator flap (AICAP) reconstruction. The median age was 44 years. The median size of the tumor was 26.8 mm. Out of 54, 45 patients had T2 (21mm-50mm). 25 (46.3%) patients underwent upfront surgery and 29 (53.7%) patients were operated on post Neo adjuvant chemotherapy. Out of all the 10 (18%), patients had multifocal tumors. Two patients (3.7%) who underwent upfront surgery had margin re-excisions for positive margins without additional morbidity (tumor size 45 mm and 50mm). Three patients (5.5%) had surgical site infection which was resolved with antibiotics. One patient (2.2%) had Superficial skin necrosis which was resolved on its own and did not cause a delay in Chemotherapy and Radiation. All the patients had very good cosmetic outcomes at 6 weeks.

Conclusions: Chest wall artery perforator-based flaps are an excellent option for lateral to central and inferior quadrant partial breast reconstructions. These procedures show good to excellent outcomes in terms of oncological safety and cosmesis avoiding mastectomy with minimal post-operative morbidity. This short-term follow-up data establish the safety of this approach. Patient-reported outcome measures need to be studied.

Table 1: Patients, tumor, and surgery characteristics and outcomes

Characteristic	Total (N=54)	LICAP (N=45)	AICAP (N=9)
Age, median (range) in years	44 (20-65)	44 (25-65)	42 (20-65)
Histology, n			
Invasive cancer	50	41	9
DCIS	4	4	0
Tumor Size, median (range), mm	26.8 (10 – 50)	26.8	25
Focality of tumor, n(%)			
Unifocal	44 (82)	35	9
Multifocal	10(18)	10	0
Surgery, n (%)			
Upfront surgery	25(46.3)	22	3
Post NAC Surgery	29(53.7)	23	6
Post Op complications, n (%)			
Wound Infection	3	3	0
Skin Necrosis	1	0	1
Positive Margins, n (%)	2 (3.7)	2	0
Re-excision, n (%)	2(3.7)	2	0
RE-admission rate (6 weeks)	0	0	0

1687989 - Preoperative Radiotherapy Prior to Autologous Reconstruction Versus Postoperative Radiotherapy After Autologous Reconstruction - 5-year Oncologic Outcomes

Daniel Leff[1], Paul Thiruchelvam[2], Neil Patani[3], Ruth Robinson[4], James Paget[4], Ronak Patel[1], Amy Godden[5], Yasmin Hassen[2], Susan Cleator[2], Dorothy Gujral[2], Anna Kirby[5], Navita Somaiah[4], Aadil Khan[5], Francesca Fiorentino[6], Simon Wood[1], Jennifer Rusby[5], Fiona Macneill[5], Dimitri Hadjiminas[2]

[1]Imperial College London, London, England, United Kingdom, [2]Imperial College Healthcare NHS Trust, London, England, United Kingdom, [3]University College Hospitals NHS Foundation Trust, London, England, United Kingdom, [4]The Institute of Cancer Research, London, England, United Kingdom, [5]The Royal Marsden NHS Foundation Trust, London, England, United Kingdom, [6]Kings College London, London, England, United Kingdom

Background/Objective: Preoperative radiotherapy (PRT) prior to mastectomy and immediate autologous reconstruction is safe and reduces cancer treatment duration, important in an era of value-based care. Despite reports suggesting microvascular reconstruction is feasible with low complication rates following PRT, few studies compare longer term oncologic outcomes to postoperative radiotherapy after immediate autologous reconstruction. Here, we aimed to compare 5-year survival and oncological safety between PRT prior to mastectomy and autologous reconstruction with deep inferior epigastric artery perforator (DIEP) flap, and post-mastectomy radiotherapy (PMRT) following DIEP flap reconstruction

Methods: A multicenter, observational, cohort study, including 95 patients of whom 47 received PRT prior to mastectomy and immediate DIEP flap reconstruction (PRT-DIEP), and 48 received adjuvant PMRT immediate DIEP flap reconstruction [DIEP-PMRT]. Patients were recruited from 01/2013 to 04/2018, and data collection and analysis was undertaken from 09/2015 to 11/2023. Local recurrence was defined as recurrence in the chest wall. Regional nodal recurrence was defined as recurrence in regional lymph nodes, including the axilla, supraclavicular fossa, or internal mammary nodes. Disease-free survival was defined as the interval between the date of diagnosis and the first breast cancer recurrence, with the event being any breast cancer recurrence (locoregional or systemic) or death. Overall survival was defined as the interval from the date of diagnosis until death from any cause. Disease-free and overall survival analyses were conducted using the Kaplan-Meier method and the binomial exact method was used to compute 95% CI.

Results: After median [IQR] follow up of 76.1 [28.7] (months), 3 patients were diagnosed with LRR, 22 had DM, and 19 died. There was no significant difference in the median (IQR) duration of follow-up (months) between PRT-DIEP=73.7(23.8) and DIEP-PMRT=70.2(28.4), (t-test, p=.509). OS was 81% in the PRT-DIEP group, and 79% in the DIEP-PMRT group. As illustrated in Figure 1, there was no significant difference in OS between PRT-DIEP and DIEP-PMRT (log rank, p=.847). DFS was 72% in the PRT-DIEP group, and 71% in the DIEP-PMRT group. No significant difference in DFS was observed between the PRT-DIEP cohort and DIEP-PMRT (log rank, p=.891). None of the patients in the PRT-DIEP group experienced LRR. Freedom from LRR was 100% in the PRT-DIEP group and 94% in the DIEP-PMRT group. The fact that there were no LRR events in the PRT-DIEP precluded Kaplan Meier Analysis.

Conclusions: PRT prior to mastectomy and autologous reconstruction is technically feasible, and oncologically safe. It is imperative that randomized trials now focus on the potential for improvement in quality-of-life outcomes as a result of PRT and avoidance of toxicity to reconstructions following PMRT.

Figures: Kaplan-Meier Survival Analysis Comparing PRT-DIEP to DIEP-PMRT

Figure 1 a)

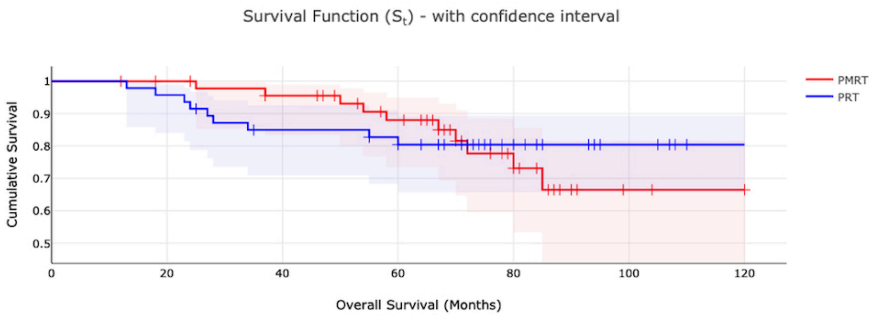


Figure 1 b)

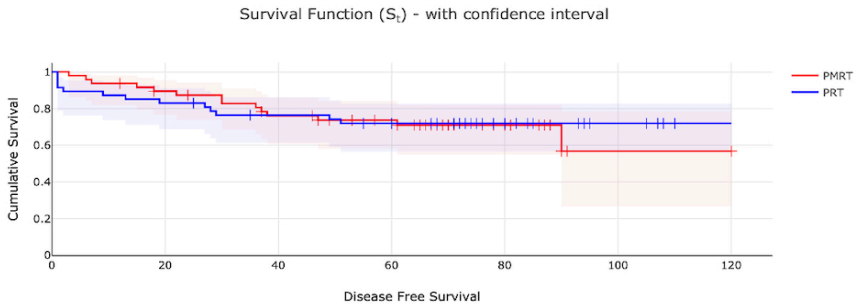


Figure 1 Legend. Kaplan-Meier survival curves comparing (a) overall survival (OS) and (b) disease-free survival (DFS) between preoperative radiotherapy group (PRT-DIEP) and post-mastectomy radiotherapy deep inferior epigastric perforator flap reconstruction (DIEP-PMRT). Data are cumulative survival against time (months).

1686438 - Evaluation and Monitoring of Breast Cancer Patients after Mastectomy with Pre-pectoral Implant Reconstruction

Madeleine Schlafly[1], Alicia Huff Arnold[2], Katharine Tracy[2]

[1]Medical College of Georgia, Augusta, GA, [2]WellStar/MCG Health/Medical College of Georgia, Augusta, GA

Background/Objective: A recent shift in the reconstruction options for breast cancer patients after mastectomy involves placing expanders or implants directly on top of the pectoralis major muscle (pre-pectoral based reconstruction or PPBR) instead of under the muscle. This has resulted in quicker recovery times, shorter hospital stays, reduced pain, and improved cosmesis. For oncologic surveillance in PPBR, detecting chest wall recurrence could be limited due to the location of the implant. Concerns arise that a local recurrence may not be identified on physical exam, given that the most common site of recurrence is the chest wall. This study had several aims, which included a survey of breast surgeons to 1) determine their familiarity of this newer, more widely adopted reconstruction technique 2) inquire of any concerns of determining chest wall recurrence 3) consideration of surveillance imaging and 4) determining need for a national registry to determine future protocols

Methods: A 12 question survey was distributed to members of ASBrS, whom majority perform breast cancer surgery to determine their knowledge/familiarity of PPBR, surveillance protocols, concerns with ability to detect chest wall recurrence, if imaging should be included, and if a national registry would be of benefit.

Results: The survey was distributed to members of ASBrS. A total of 416 surgeons responded. Active practicing surgeons that perform breast surgery totaled 406. Ninety-one percent of breast surgeons work with a plastic surgeon who performs PPBR. Eighty-six percent (356 out of 416) of the surgeons follow their patients for more than two years for ongoing surveillance. Eighty percent (331 of 413) surgeons do not order routine imaging for PPBR patients. Forty-eight percent (197 out of 412) of surgeons are unsure or agree that the physical exam for detecting recurrence is limited, and 240 surgeons of 411 (58%) either agree or are unsure whether imaging would be a helpful supplement. If surveillance imaging was utilized, 80% of surgeons felt MRI would be most useful. Only 22% of surgeons (99 of 415) did not feel a national registry was needed to track cancer patients who have undergone PPBR, whereas 236 surgeons agreed a registry was needed and 86 were unsure.

Conclusions: This survey demonstrated that majority of breast surgeons are familiar with PPBR technique following mastectomy and also provide oncologic surveillance for their patients for at least two years. It's unclear if surgeons perceive the physical exam is limited due to location of the implant on top of the chest wall (48% agreed or didn't know) and whether or not additional imaging in these patients would be beneficial. The overwhelming majority of surgeons felt if imaging would be used, breast MRI was the best modality. There are currently no established surveillance protocols after PPBR, in which majority of plastic surgeons are adopting or transitioning to this technique currently. Due to the uncertainty among breast surgeons for PPBR surveillance, i.e. physical exam alone, other imaging, etc., creation of a national registry to monitor PPBR patients and determine mode of detection of recurrence is supported by majority of surveyed surgeons.

1687698 - Isotope-free Tracers for Sentinel Lymph Node Identification in Breast Cancer: A Network Meta-Analysis

Michael Boland[1], Eirini Pantiora[2], Matthew G Davey[1], Lida Pistioli[3], Ruut Maaria Pelkonen[2], Antonis Valachis[3], Stavroula Lila Kastora[4], Daniel Smith[3], Marios K Tasoulis[5], Andreas Karakatnis[6]

[1]St Vincent's University Hospital, Dublin, Ireland, [2]Uppsala University, Uppsala Lan, Sweden, [3]Örebro University, Orebro Lan, Sweden, [4]University College London, UCL EGA Institute for Women's Health, London, England, United Kingdom, [5]Royal Marsden NHS Foundation Trust, London, England, United Kingdom, [6]Uppsala University, Sweden, and Uppsala University Hospital, Uppsala Lan, Sweden

Background/Objective: Radioisotope (RI) with or without blue dye (BD) has been traditionally utilised for sentinel lymph node (SLN) biopsy in breast cancer. However, limitations such as availability and regulations for RI and skin staining, or anaphylaxis for BD have motivated interest in new tracers. The aim of this network meta-analysis was to perform a comprehensive comparison of novel tracers with RI +/-BD.

Methods: A systematic review and network meta-analysis was conducted without time stipulation, with data extraction by two independent reviewers. We considered randomized clinical trials and comparative observational studies with >10 participants and a synchronous RI-based comparison. The primary outcome was the detection rate. Secondary outcomes included nodal detection rate (number of SLNs detected per tracer compared to standard) and metastatic nodal detection rate (number of metastatic SLNs detected per tracer compared to standard). A binary network meta-analysis was undertaken using frequentist and Bayesian methodology and an a priori random effects model, with risk ratio (RR) as the selected effect size with 95% confidence and credibility intervals, respectively. Bias assessment was performed with the Cochrane Risk of Bias 2 (RoB 2) tool for randomized trials and the Methodological Index for Non-Randomized Studies (MINORS) for observational studies.

Results: Totally, 92 studies involving 16698 patients were included; 40 studies assessed Indocyanine Green (ICG), 23 assessed Superparamagnetic Iron Oxide (SPIO), 11 assessed contrast enhanced ultrasound (CEUS), 9 assessed blue dye (BD) only, 4 studies assessed carbon nanoparticles (CNP), 3 assessed fluorescein and 2 assessed Mitoxantrone. With RI-based detection as comparator, SPIO (RR = 1.01; 0.99-1.03) and ICG (RR = 1.01; 0.99-1.03) performed best, followed by CNP (RR = 1.00; 0.95-1.06) and mitoxantrone (RR = 0.97, CI: 0.91-1.05) and flourescein (RR = 0.94, CI: 0.88-1.0), with the latter three supported by significantly less studies, whereas CEUS (RR = 0.93; 0.90-0.96), BD only (RR = 0.93; 0.92-0.95) were inferior. When evaluating nodal detection rate, SPIO (RR = 1.10; 1.03-1.19) and ICG (RR = 1.15; 1.07-1.23), were significantly likely to identify more nodes compared to RI+/- BD and other tracers. When evaluating metastatic nodal detection rate, CEUS (RR = 1.55, random effects model; CI: 1.20-2.0), ICG (RR = 1.06, CI: 1.01-1.11) and CNP (RR = 1.34; CI: 1.04-1.71) were significantly more likely to identify more metastatic nodes compared RI+/- BD and other tracers. Study quality was high across all tracers (Median MINORS score = 21, range: 9-24). Trial sequential analysis (TSA) showed that the information size from the meta-analysis was adequate for SPIO and ICG, but not the other tracers.

Conclusions: Of all the newer, isotope-free tracers, SPIO and ICG perform comparably to RI +/- BD and identify more SLNs, likely associated with improved axillary staging. The NMA and TSA performed suggest that, unless statistical superiority needs to be proven, SPIO and ICG can be utilised routinely instead of RI +/- BD. Breast surgeons should consider standard use of such tracers in their practice.

1671422 - Should Palpable Nodes Be Exclusionary in Patients Who Are Otherwise Candidates for ACOSOG Z0011-Type Trials?

Cassandra Cardarelli[1], Elissa C Dalton[2], Austin Williams[2], Cecilia Chang[3], Allison A Aggon[2], Andrea S Porpiglia[2], Mary T Pronovost[2], Richard Bleicher[2]

[1]Fox Chase Cancer Center, Willow Grove, PA, [2]Fox Chase Cancer Center, Philadelphia, PA, [3]NorthShore University HealthSystem, Evanston, IL

Background/Objective: A complete exam following a diagnosis of breast cancer includes palpation of nodal basins, but body habitus can make physical examination inaccurate, and nodes can be palpable for reasons other than metastatic disease. Palpable nodes were exclusionary in American College of Surgeons Oncology Group (ACOSOG) Z0011, while SINODAR-ONE excluded those with clinically positive axillary nodes by palpation and ultrasound. In order to determine whether clinical nodal status should be exclusionary in those fulfilling pathologic criteria for ACOSOG Z0011 and similar trials, this study analyzed the accuracy and implications of clinical nodal positivity.

Methods: Patients were identified utilizing the National Cancer Database who were ≥18 years old and had cT1mi-cT2, cN0-cN1, M0 breast cancer between 2004 to 2019 to allow for at least one year of follow up. Patients were excluded who had neoadjuvant therapy. Subset characteristics of cN1 and cN0 were compared with respect to final pathologic nodal status and overall survival (OS).

Results: A total of 57,823 patients were identified, with 77.0% being cT1 and 23.0% being cT2 while 69.0% underwent breast conservation. Among the 54,307 (93.9% of total) patients staged as cN0, 16.7% were found to be pN1, while among the 3,516 (6.1% of total) staged as cN1, 9.6% were found to be pN0. Multivariable predictors of falsely-positive clinical nodal staging were intermediate/high grade, HER2-positivity, the presence of lymphovascular invasion (LVI), and cT2 tumors (as vs cT1). Predictors of ALND performance in those who were cN1 were age, greater comorbidities, biopsy of a site other than the primary, high grade, LVI, and cT2 tumors. Among patients who were cN1 and found to be pN0 (n=336), 69.6% underwent sentinel lymph node biopsy (SLNB) alone, but 15.5% added an axillary lymph node dissection (ALND) and 14.9% had an ALND without a SLNB. When adjusting for age, sex, race, Hispanic ethnicity, Charlson/Deyo comorbidity score, histology, institution type, grade, ER, PR, HER2, lymphovascular invasion, T stage, and use of chemotherapy, radiotherapy and endocrine therapy, there was no difference in the OS for patients staged as cN0 versus cN1 who were found to be pN1 (HR 1.128, 95%CI 0.932-1.365, p=0.215). A sensitivity analysis for OS, with similar adjustment, for cN0 vs cN1 patients who were found to have 2 positive nodes also demonstrated no difference (HR 0.912, 95%CI 0.62-1.33, p=0.634).

Conclusions: The limits of physical examination secondary to body habitus or other factors that may render a node palpable, and even the limits of imaging, can result in inaccurate clinical staging. A stage of cN0 vs cN1 does not affect OS in those found to be pN1 overall, or in the subset of patients having 2 positive nodes. Meanwhile, clinical nodal assessment can both overstage patients and result in unnecessary axillary surgery. These data suggest that patients preoperatively deemed to be cN1 who are otherwise candidates for a Z0011-like paradigm should still be considered eligible. Their final candidacy should be determined by surgical lymph node pathology and not preoperative clinical status.

1677196 - Expectation versus Reality: Impact of the Choosing Wisely Campaign on Routine Use of Sentinel Lymph Node Biopsy in Women Over 70 with Early-stage Breast Cancer in an Academic Institution

Andrea Lifrieri, Allen Yu, Ashley Tsang

Icahn School of Medicine at Mount Sinai, New York, NY

Background/Objective: In 2016, the Society of Surgical Oncology (SSO) issued a Choosing Wisely recommendation to omit routine sentinel lymph node biopsy (SLNB) in patients ≥ 70 years of age with early stage, low risk, clinically node-negative, hormone receptor (HR) positive and human epidermal growth factor receptor 2 (Her2) negative breast cancer. This study aimed to evaluate surgical practice within an academic institution since the campaign's inception, and to determine what factors, if any, contributed to adherence. We hypothesize that younger age, larger tumor size and perceived higher risk histology, such as lobular type, would lead to higher prevalence of SLNB.

Methods: A retrospective chart review of patients who met Choosing Wisely Campaign criteria and underwent a lumpectomy at an academic institution from February 2018 to March 2020 was performed. Relevant data such as patient demographics, tumor size and histology were extracted from the medical record. Patient's T-test and chi-squared tests were used when appropriate. Multivariate logistic regression was performed with locoregional and distant recurrence as the outcome variable, adjusting for significant univariate covariates such as age, margin, tumor size, and endocrine therapy.

Results: Eighty five patients met criteria. Sixty five patients (76.5%) underwent SLNB and 46 (54.1%) received adjuvant radiotherapy. Patients who were younger tended to have a SLNB performed (75.1 years vs 80.3, $p < 0.001$). Median follow-up was 46 months, with three (3.5%) local recurrences, one ductal type, another lobular, and the third mixed. No distant recurrences were found. SLNB and radiotherapy were not associated with reduced recurrence. There were four (4.7%) recorded mortalities, none of which were disease-related. Ten patients (11.8%) had invasive lobular carcinoma and 81.8% of these patients underwent SLNB. On multivariate analysis, SLNB was not a predictor of recurrence ($p=0.771$), but increased age (OR 1.01, 95% CI [1.00-1.02], $p < 0.05$) and tumor size > 3cm (OR 2.01 [1.71-2.30], $p < 0.001$) were predictors of recurrence.

Conclusions: Our findings support the growing evidence that the majority of women who meet the Choosing Wisely campaign criteria continue to undergo SLNB despite the fact that the recurrence rates and disease-related mortality remain low in this patient population regardless of the treatment received. SLNB carries risk of complications such as lymphedema. The results of this study emphasize the need to maintain dialogue regarding the overuse of unnecessary treatments, which could lead to less morbidity and improve patient outcomes.

1688348 - Effects of Sentinel Lymph Node Biopsy on Decision for Adjuvant Chemotherapy in the Modern Era of Gene Expression Profiling

Rebecca Breese, Stephanie Bennett, Sarah Alnaif, Hajara Ouattara, Rachel Burke

Eastern Virginia Medical School, Norfolk, VA

Background/Objective: Staging of the axillary lymph nodes, first with axillary dissection and now with SLNB, has historically been an important part of staging in breast cancer, and it is the standard of care in patients with early stage cancer undergoing partial mastectomy. However, any axillary surgery, including SLNB, carries a higher morbidity, such as increased pain and the risk of lymphedema. Several groups have begun looking at the utitily of performing SLNB in ER+/HER2- breast cancers that are clinically T1-2 and node negative. Studies such as TAILORx and RxPONDER have shown that there is no benefit to chemotherapy in postmenopausal patients with hormone receptor positive tumor with an Rx score < 25. Additionally, the SOUND trial recently showed that patients with small, < 2cm, tumors can be safely spared axillary surgery when axillary staging does not affect the treatment plan. In the setting of modern gene expression profiling and the validity of using axillary ultrasound to determine nodal status, the utility of performing SLND is now even more in question. The primary aim of this study is to evaluate patients with cT1-2N0, ER+/HER2- breast cancer and determine if adjuvant chemotherapy was performed on patients based on sentinel node status or gene expression profiling results.

Methods: A retrospective chart review was performed on female patients between 18-89 years of age at the time of their breast cancer diagnosis between 2016 and 2021, who had clinical T1-2N0 breast cancer and underwent SLNB and gene expression profiling (Oncotype DX, MammaPrint, or EndoPredict). Data collected included demographics, tumor characteristics, genetic testing, surgery performed, adjuvant treatment course, and gene expression profiling results.

Results: A total of 140 patients were reviewed. 72 patients were missing gene expression profiling data, so 68 patients were included for study. Ages ranged from 36 to 81 years old, with most being in their sixth to seventh decade of life. Three patients (4%) underwent mastectomies and the remainder underwent breast conservation. Seven patients (10%) had positive lymph nodes on SLNB, one of which also had a high-risk gene expression profile and underwent chemotherapy. Of the remaining six patients with positive lymph nodes and low risk profiles, only 3 (50%) underwent chemotherapy. Sixty patients had negative lymph nodes on pathology. Of those 60 patients, 13 (22%) had high risk profiles. Nine of those patients (70%) underwent chemotherapy. None of the 47 patients with negative lymph nodes and low risk gene expression profiles underwent chemotherapy.

Conclusions: Our preliminary results suggest that gene expression profiling holds more weight than nodal status in determining adjuvant therapy. Our study is limited by sample size, and data collection is still ongoing. Premenopausal patients were included for the purpose of this report, but ultimately will be evaluated separately from postmenopausal patients, as in other similar studies. These findings contribute to the growing evidence that a significant percentage of patients with breast cancer may be spared axillary surgery.

1683705 - All-cause Outpatient Revisits Associated With Three Sentinel Lymph Node Detection Techniques Among Breast Cancer Patients: A Propensity Score Weighted Analysis

Michelle Sosa[1], Deirdre McNicholas[2], Seth Emont[3], Zhun Cao[3], Manu Tyagi[3], Craig Lipkin[4], Arbelina Bebla[5], Sommer Gunia[6]

[1]Stryker, Seattle, WA, [2]Stryker, Willow Grove, PA, [3]PINC AI™ Applied Sciences, Charlotte, NC, [4]Premier Inc., Jamison, PA, [5]Stryker, San Jose, CA, [6]Breast Center of Arizona PLC, Scottsdale, AZ

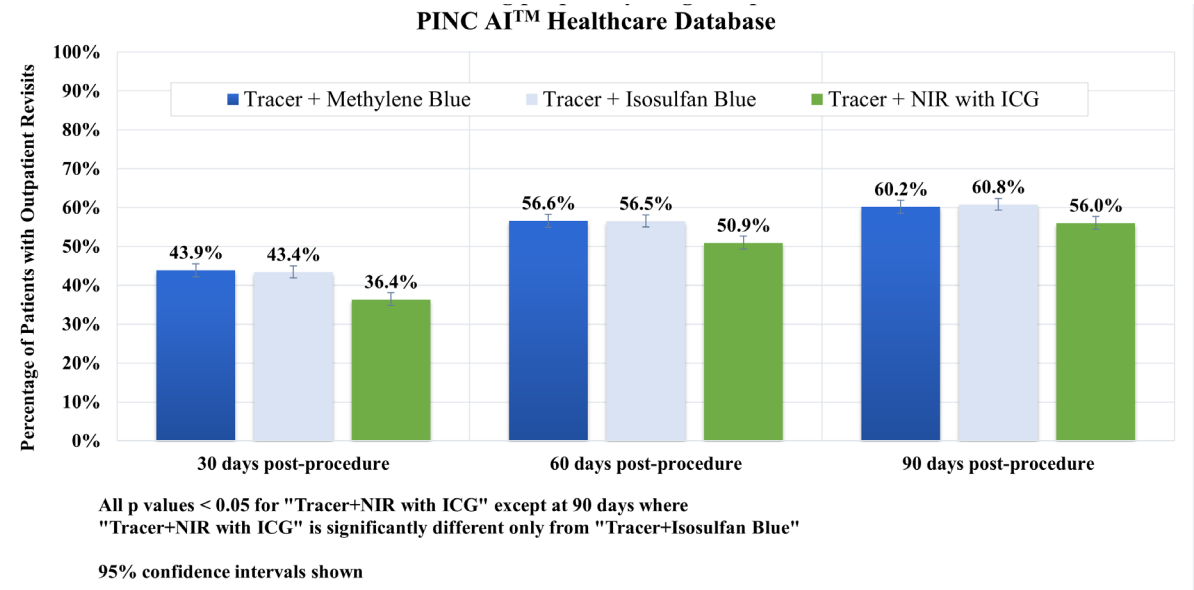
Background/Objective: The day-to-day journey experienced by breast cancer patients is stressful, costly, and disruptive partly due to numerous outpatient (OP) visits. One of these OP visits may be for sentinel lymph node (SLN) mapping which helps to inform patients' breast conservation treatment plan. Visualization of sentinel lymph nodes is often enhanced with radioactive tracer, Technetium-99m (Tc99m), in combination with another imaging agent such as isosulfan blue (IS), methylene blue (MB), or indocyanine green (ICG) dye. The purpose of this study is to evaluate the incidence of OP revisits of three breast lymphatic mapping approaches to determine which of these dye plus tracer pairings may be associated with the fewest OP revisits, ultimately helping to reduce the burden breast cancer patients experience.

Methods: This study included adult female patients with a breast cancer diagnosis who underwent SLN mapping and had an index OP hospital discharge date between July 1, 2017 and August 31, 2022. Three patient groups were established according to the specific SLN mapping approach they underwent: isosulfan blue plus tracer (IS + Tc99m), methylene blue plus tracer (MB + Tc99m), near-infrared fluorescence using ICG dye plus tracer (NIRF with ICG + Tc99m). Propensity score weighting using generalized boosted modeling (GBM) was used to address imbalances in patient, clinical, and hospital characteristics; GBM can adjust for many covariates and allows for greater model complexity. Stepwise regression with forward selection using logistic regression was used to determine a final fitted model of 30-, 60- and 90-day OP revisits. Adjusted odds ratios (aORs) and 95% confidence intervals were calculated.

Results: A total of 1,067,677 adult female patients with a breast cancer diagnosis had an index OP hospital discharge date between July 2017 and August 2022, with 5.6% (n=60,068) undergoing SLN mapping at their index visit. Of these, 71.6% (n=42,988) met the inclusion criteria and were included in the unadjusted analysis. In the propensity weighted sample, there were 1,971 patients included (IS + Tc99m = 656, MB + Tc99m = 647, NIRF with ICG + Tc99m = 668). The NIRF with ICG + Tc99m cohort had the lowest OP revisits at 30-, 60-, and 90-days compared to the IS + Tc99m cohort and the MB + Tc99m cohort [30 days: 36.4% vs. 43.4% vs. 43.9%; 60 days: 50.9% vs. 56.5% vs. 56.6%; 90 days: 56.0% vs. 60.8% vs. 60.2%, respectively; all p values < .03]. After controlling for all covariates in the regression analyses, aORs were statistically significant for the NIRF with ICG + Tc99m cohort [30-day aOR: 0.73 (0.62-0.87); 60-day aOR: 0.78 (0.67-0.93); 90-day aOR: 0.81 (0.69-0.96); all p values < 0.02]. Outpatient revisits in all three groups were primarily due to standard services, including but not limited to blood draws, radiation treatment, and pain management.

Conclusions: SLN mapping with near-infrared fluorescence imaging using ICG and a tracer may reduce the number of OP revisits compared to the other two SLN detection techniques. This is important, as fewer OP revisits may help to improve breast cancer patients' care experience.

Figure 1: Percentage of sentinel lymph node mapping patients with all-cause outpatient hospital revisits among propensity weighted patients



1684384 - Don’t Forget the Node; Listen to SOUND with Caution!

Brittany Murphy[1], Xiaoying Chen[2], Wei Wei[2], Chirag Shah[2], Zahraa Al-Hilli[2]

[1]Banner MD Anderson Cancer Center, Phoenix, AZ, [2]Cleveland Clinic, Cleveland, OH

Background/Objective: The recently published SOUND trial suggests that for patients with < 2cm of invasive disease with normal appearing axillary lymph nodes on ultrasound, performance of sentinel lymph node (SLN) surgery does not influence disease free survival and may therefore be omitted. The National Cancer Data Base (NCDB) has been used to evaluate omission of SLN in older women and in women with specialized tumor types, but not in women of all ages.

Methods: Using the NCDB, women ≥18 years of age with cTis, cT1 or cT2 and pT1 or T2 breast cancer who underwent upfront surgery between 2010 and 2017 were identified. Univariate comparisons were made with Chi-squared tests. Overall survival (OS) was estimated by the Kaplan-Meier method and was compared by the log-rank tests. Analyses were stratified by performance of SLN.

Results: A total of 496,792 patients met inclusion criteria, of whom 31,307 (6.3%) did not undergo SLN and 465,485 (93.7%) did. Of patients who had SLN, 89% were pN0. Omission of SLN increased over the study period (8.2% in 2010, 17.3% in 2017). The majority of patients who did not undergo SLN were over age 70 at the time of diagnosis (5.3% < 50, 31.2% 50-69, 63.5% >70). Charleson-Deyo (CD) comorbidity index was 0 in 82.9% (385,757/465,485) versus 76.2% (23,816/31307) of patients undergoing SLN versus not. A similar proportion of patients underwent mastectomy and lumpectomy in each group, with the majority of patients undergoing lumpectomy (72.8% of patients undergoing lumpectomy with SLN and 72.3% undergoing lumpectomy without SLN), p=0.09. Median follow-up was 76.3 months (range: 0-146.6 months). In the entire cohort, the 5-year OS was 94% when SLN was performed and 80% when SLN was omitted. When only patients with cTis who were upstaged to pT1 or pT2 disease were evaluated (n=15,239), the 5-year OS was 97% (n=12,658) when SLN was performed and 92% (n=2,581) when it was omitted, p< 0.0001. In this cohort, the 5-year OS was 99% in patients < 50, 97% in patients 50-69 and 90% in patients ≥70. The 5-year OS was 97% for patients with a CD index of 0 vs 90% for a CD index of ≥1. When patients with cT1 or cT2 who had pT1 or pT2 disease were evaluated (n=481,543), the 5-year OS was 94% (n=452,817) when SLN was performed and 79% (n=28,726) when it was omitted, p< 0.0001. In this cohort, the 5-year OS was 98% in patients < 50, 96% in patients 50-69 and 85% in patients ≥70. The 5-year OS was 94% for patients with a CD index of 0 vs 87% for a CD index of ≥1.

Conclusions: In the NCDB, women with cTis-T2 and pT1-2 breast cancer who had omission of SLN evaluation had a decreased OS in comparison to patients who underwent SLN. Factors associated with worse OS warrant further investigation. While this data is limited by selection bias, it raises concern regarding wide acceptance of the SOUND trial results.

1688201 - Institutional Pathology Costs of Intraoperative Sentinel Node Evaluation in Early-stage Breast Cancer

Jean Bao[1], Alex Dussaq[2], Kimberly Allison[2], Megan Troxell[2], Jacqueline Tsai[2], Irene Wapnir[2], Frederick Dirbas[2]

[1]Stanford University, Alameda, CA, [2]Stanford University, Stanford, CA

Background/Objective: Both the ACOSOG Z0011 and the AMAROS trials demonstrated axillary lymph node dissection (ALND) does not provide survival or locoregional benefits compared to sentinel node biopsy (SNB) alone in patients with limited nodal disease treated with appropriate postop radiotherapy. The use of intraoperative nodal evaluation (INE) persists at many institutions including ours. We aimed to assess the clinical impact and additional dollar cost of INE for patients presenting with early stage, clinically node-negative (cN0) breast cancer at our institution.

Methods: We retrospectively reviewed the consecutive records from a cohort of surgeons for patients with cN0 breast cancer treated with upfront surgery with SNB between January 2020 to December 2020. Individuals presenting with node-positive disease, a history of neoadjuvant therapy, and unsuccessful sentinel node mapping were excluded. Type of INE, touch prep (TP) or frozen section (FS), was determined by the pathologist on duty. Patient and tumor characteristics, method of INE, intraoperative and final pathology results, and pathology costs using 2023 Medicare billing rates were analyzed to determine the frequency with which INE altered clinical management as well as the additive dollar costs of INE to overall patient care costs.

Results: 143 SNB cases were identified in 139 patients with an average age of 57.3 years. The majority of patients (90.9%) had invasive cancer. 112 patients underwent lumpectomy (78.3%) and 31 (21.7%) received mastectomy. INE was performed for 118 of 143 SNB (82.5%): 59.3% by TP and 40.7% by FS. An average of 2.9 nodes were evaluated by INE. 9 INE (7.6%) were positive, one of which was a false-positive by TP. 12 of 118 had a false-negative (FN) INE (10.2%). All FN INE had two or fewer macrometastatic nodes on final pathology. TP had a sensitivity of 0% and specificity of 98.4% for detecting carcinoma. 4 of the 8 FN TP cases showed only micrometastasis on final pathology. FS had a sensitivity of 66.7% and specificity of 100%. All true-positives and false-negatives by FS contained macrometastasis on final pathology. INE led to ALND in only 2 cases (1.4%). No cases with FN INE had delayed ALND. 141 cases (98.6%) presented with cT1-2 disease and hence fit the inclusion criteria for ACOSOG Z0011 and/or AMAROS. If INE were omitted in these cases, patient care costs, based on Medicare billing, could have been reduced by $97,151.21 in one year, and $689.02 per patient.

Conclusions: Most cN0 cases fit ACOSOG Z0011 and/or AMAROS inclusion criteria. INE rarely led to ALND. INE can be omitted with cost-saving of at least $689.02 per patient using Medicare billing rates. This cost savings does not reflect additional potential increased efficiency of care by decreasing time committed to INE for operating room staff, transport, and pathologists. The high rate of INE and extremely low rate of subsequent ALND represent opportunities for improvement. For cases needing INE, FS over TP should be considered, depending on the pathologist's skill set.

1685504 - Comparison of Completion Axillary Lymph Node Dissection Versus Regional Nodal Irradiation in Early-stage Breast Cancer Patients with Three or More Positive Sentinel Lymph Nodes: A Population-based Study

Daniel Lustig[1], Conrad Bayley[2], Tien Phan[2], Jeffrey Cao[2], May Lynn Quan[2], Antoine Bouchard-Fortier[2]

[1]University of Calgary, Burlington, ON, Canada, [2]University of Calgary, Calgary, AB, Canada

Background/Objective: The optimal management of patients with early-stage breast cancer who have 3 or more positive sentinel lymph nodes (SLNs) is unknown as they were either excluded or underrepresented in the landmark ACOSOG Z11 and AMAROS trials, respectively. Our study aims to determine whether there is a difference in recurrence free survival (RFS) and breast cancer specific survival (BCSS) in this patient population who were treated with regional nodal irradiation (RNI) alone versus completion axillary lymph node dissection (cALND) ± RNI.

Methods: A retrospective study using a prospectively collected provincial database was performed to identify patients with clinically node negative early stage breast cancer (cT1/T2N0) who underwent breast surgery (mastectomy or partial mastectomy) and had 3 or more positive SLNs between 2010 - 2017. Patients who received neoadjuvant chemotherapy were excluded. Chi-square analysis was used to compare baseline patient characteristics between the study groups. Kaplan-Meier survival curves using log-ranked analysis were used to determine the 10-year recurrence and 10-year survival between the RNI and cALND ± RNI cohorts.

Results: A total of 1,780 patients underwent breast and axillary surgery of which 89 patients were included in our study. The median follow-up was 7.6 years (5.0 – 14.0). Among the study cohort 36.0% (n=32) received RNI alone versus 64.0% (n=57) who underwent completion ALND ± RNI (26.3%, [n=15] cALND alone and 73.7% [n=42] cALND with RNI). The mean age was 58.1 years (27 – 87). Within the study cohort 75.3% (n=67) of patients were hormone positive, 15.7% (n=14) were HER-2 enriched and 9.0% (n=8) had triple negative disease. Adjuvant breast radiation, chemotherapy and hormone therapy were administered in 94.4% (n=84), 83.1% (n=74) and 82.0% (n=73) of patients, respectively. There were no differences in the histological subtype (p=0.12), receptor status (p=0.36), grade (p=0.21), T-stage (p=0.11) or adjuvant treatment received (p>0.30) between the two study cohorts. The mean number of SLNs removed was 4.5 ± 1.9 and in those who underwent a cALND, an additional 11.8 ± 6.2 were collected. The overall recurrence rate was 28.1% (n=25/89) with local and distant recurrence rates of 3.4% (n=3/89) and 24.7% (n=22/89) respectively. Overall survival was 75.3% (n=67/89) and the breast cancer specific survival was 77.5% (n=69/89) in the entire study cohort. There was no difference in overall recurrence (21.9% vs. 31.6%; p=0.33), locoregional (6.3% vs. 1.8%; p=0.26) or distant recurrence (15.6% vs. 29.8%; p=0.14) between those treated with RNI alone vs. cALND respectively. Moreover, there was no difference in overall survival (78.1% vs. 73.7%; p=0.64) or BCSS (78.1% vs. 77.2%, p=0.92) when comparing RNI to cALND ± RNI. However, lymphedema was significantly higher in cALND group (3.1% vs. 21.1%, p=0.02).

Conclusions: Our population-based data analysis did not show statistically significant differences in recurrence rates nor survival in patients with early-stage breast cancer found to have 3 or more positive lymph nodes on SLNB when treated with RNI alone versus cALND. This select cohort of patients may potentially avoid the morbidity associated with cALND if treated with RNI alone without compromising locoregional control of the axilla.

1688484 - The Varying Incidence of Sentinel Lymph Node Metastases in Women With Breast Cancer

S David Nathanson[1], Shravan Leonard-Murali[2], Jenny Bui[1], Dhananjay Chitale[1], Jessica Bensenhaver[1], Theresa Schwartz[1], Lindsay Petersen[1], Kylie Springer[1], Laura Susick[1], Patricia Baker[1]

[1]Henry Ford Health System, Detroit, MI, [2]University of Pittsburgh, Pittsburgh, PA

Background/Objective: Current 'Choosing Wisely' practice guidelines suggest >70 as a safe cutoff age for omission of sentinel lymph node (SLN) biopsy in patients with biologically and pathologically less aggressive breast cancer (BC). The focus of older age as a reason for avoiding SLN biopsy fits with our prior observation that older women with small, low-grade tumors without lympho-vascular invasion (LVI) have a very low likelihood of SLN metastases. We hypothesized

that younger women with less aggressive tumors would similarly have a low likelihood of SLN metastases and might thus also justify omission of SLNB.

Methods: Using parametric and non-parametric statistical tests as appropriate we evaluated demographic and clinicopathologic variables from a unique prospective, long term (1995-2022) continuously maintained data base of early BC patients undergoing SLN biopsy in our vertically integrated healthcare system. The incidence of LN metastases was calculated for each combination of the four variables (lymphovascular invasion [LVI], age [years], tumor grade [G1 or G2/3] and size [cm]) that significantly predicted the likelihood of LN metastases in multivariable analysis.

Results: 4433 (88.4%) out of 5014 patients were included by defined criteria, 816 (18.4%) with and 3617 without SLN metastases. LN metastases were found in12/211 (5.69%), 23/377 (6.1%) and 30/504 (5.95%) of patients ages > 70, > 60 or > 50, respectively, with tumors < 1 cm, G1, LVI negative. 21/354 (5.93%), 10/188 (5.32%), and 3/61 (4.92%) of patients ages < 70, < 60, or < 50, respectively, with tumors < 1 cm, G1, LVI negative had LN metastases. There were no statistically significant differences between older and younger patients with these early less aggressive tumors. LN metastases were present in 77/820 (9.39%) and 9/116 (7.76%) of patients aged > 50 or < 50, respectively, with larger (< 2 cm) G1, LVI negative tumors (p=0.5714). The incidence of LN positivity increased proportionate to the combination of variables, the highest, 54.95%, in patients aged < 50, with tumors >1 cm, G2/3, LVI positive (p<.0001).

Conclusions: BC patients with low grade < 1 cm tumors without LVI have a low (< 6.1 %) likelihood of LN metastases irrespective of the patient's age. Based upon the incidence of LN metastases our study suggests that age restriction might not be necessary when considering omission of SLN biopsy. Although our study on its own does not justify a change in clinical practice it does suggest a randomized prospective clinical study in which younger patients with small, low-grade BCs without LVI with or without SLN biopsy might be valuable.

1687632 - Axillary Nodal Disease Burden in HR+ Breast Cancer Patients Undergoing Upfront Surgery

Malia Brennan[1], Emily Palmquist[1], Jasleen Bains[1], Bill Young[1], Claire Buchanan[1], Kristine Calhoun[1], Sara Javid[1], Meghan Flanagan[2]

[1]University of Washington, Seattle, WA, [2]University of Washington / Fred Hutchinson Cancer Center, Seattle, WA

Background/Objective: Studies demonstrate equivalent locoregional disease control with omission of axillary lymph node dissection (ALND) in clinically node negative breast cancer with < 3 positive sentinel lymph nodes (SLN). However, increased use of pre-operative imaging may lead to overtreatment of otherwise clinically node negative patients. In non-palpable axillary disease, SLNB may be performed in those with 1-2 biopsy-proven abnormal nodes on imaging, while ALND is warranted in those with >3 nodes positive. The purpose of this study is to identify imaging, patient, and tumor characteristics that predict higher axillary node burden (>3 nodes +) in patients with hormone receptor-positive HR+ breast cancer undergoing upfront surgery.

Methods: This was a retrospective single institution analysis comprised of newly diagnosed HR+ breast cancer patients undergoing upfront surgery between October 2020 and June 2023. The study population was restricted to patients who were biopsy-proven clinically node positive (cN1) or clinically node negative but found to have nodal positivity on final surgical pathology (cN0pN+). Clinicopathologic and treatment data were collected from internal institutional tumor registry and medical records. Univariate and multivariable logistic regression were performed to evaluate factors associated with ≥3 positive nodes.

Results: 302 patients met inclusion criteria; 226 (75%) were cN0pN+ and 76 (25%) were cN1. The majority of patients (234/302, 77%) had 0-2 positive nodes on final pathology. There were no significant differences among those with 0-2 versus ≥3 positive nodes on final pathology based on age (median 54), menopausal status, body mass index, pre-operative physical exam, presence of abnormal appearing lymph nodes on mammogram or tumor grade (all p>0.05). Patients with ≥3 pathologically-positive nodes were more likely to have abnormal appearing lymph nodes on ultrasound (78% vs. 41%, p< 0.001) and MRI (78% vs. 35%, p< 0.001), multifocal/centric disease (47 vs. 29%, p=0.006), undergo mastectomy (68% vs. 49%, p=0.007), higher median pathologic tumor size (42 vs 23mm, p< 0.001), lobular or mixed ductal/lobular histology (31% vs. 22%, p=0.03), but were less likely to have ≥90% estrogen receptor positivity (87% vs. 93%, p=0.03). Among patients who underwent pre-operative ultrasound with ≥3 abnormal appearing nodes (20/157, 13%), 65% had ≥3 positive nodes on final pathology. In patients who underwent MRI with ≥3 abnormal appearing nodes (41/239, 17%), 54% had ≥3 positive nodes on final pathology. Of note, the majority of patients with ≥3 positive nodes on final pathology had either no pre-operative ultrasound (32%) or 0-2 abnormal nodes on ultrasound (49%). Multivariable analysis demonstrated the only factor associated with ≥3 positive nodes was ≥3 abnormal appearing lymph nodes on MRI (OR 4.49, 95% CI 1.68-11.99).

Conclusions: In this contemporary cohort of cN0pN+ and cN1 HR+ breast cancer, ≥3 abnormal-appearing lymph nodes on MRI was significantly associated with ≥3 positive lymph nodes. However, nearly half of patients with such findings on MRI had < 3 nodes positive and could safely be spared axillary dissection. Although imaging appears somewhat helpful in identifying heavy axillary disease burden US and MRI have limitations regarding their ability to predict extent of axillary nodal disease in HR+ breast cancer patients undergoing upfront surgery.

Table 1: Multivariable analysis of factors associated with ≥3 positive lymph nodes among women with HR+ cN0pN+ / cN1 breast cancer

Patient Characteristics	Odds Ratio	95% CI	p-value
Race			
White	1	reference	
Black or African American	2.289153	0.26,19.97	0.45
Asian	0.8613789	0.20,3.79	0.84
American Indian/Alaska Native	5.9707	0.47,75.77	0.17
Declined to Answer / Unknown / Other	0.7530295	0.08,7.06	0.80
Pre-operative ultrasound			
0-2 abnormal appearing nodes	1	reference	
≥3 abnormal appearing nodes	1.486501	0.34,6.47	0.60
Pre-operative MRI			
0-2 abnormal appearing nodes	1	reference	
≥3 abnormal appearing nodes	4.354738	1.49,12.75	0.007
Multifocal/multicentric disease	1.423287	0.50,4.06	0.51
Mastectomy	0.9627648	0.32,2.85	0.95
Pathologic tumor size (mm)	1.02299	1.00,1.05	0.08
Histology			
Invasive ductal carcinoma	1	reference	
Invasive lobular carcinoma	0.7808165	0.23,2.62	0.69
Invasive mammary carcinoma	2.546692	0.22,29.10	0.45
Estrogen receptor expression	1	reference	
10-50%	0.9482954	0.20,4.42	
51-89%	1	1.00,1.00	0.95
≥90%			

1688234 - A Single Arm, Prospective, Open Label, Multicenter Study Assessing the Safety and Effectiveness of SPY AGENT GREEN and SPY Portable Handheld Imager in Lymphatic Mapping and Sentinel Node Biopsy in Subjects with Breast Cancer (FILM-B)

David Weintritt

Virginia Cancer Specialists, Alexandria, VA

Background/Objective: To assess effectiveness of the SPY AGENT GREEN (study version of Indocyanine Green or ICG) and SPY Portable Handheld Imaging System (SPY-PHI) in the identification of lymph nodes (LNs) during lymphatic mapping and sentinel lymph node biopsy (SLNB) in subjects with early-stage breast cancer.

Methods: A prospective, open label, multicenter, non-inferiority within-patient study was designed to assess the safety and effectiveness of SPY-PHI/SAG in the identification of LNs (histology confirmed). All patients were mapped with Tc-99m per institutional protocol and with SPY AGENT GREEN in a one-time set of two intra-dermal injections in the peri-areolar area of the affected breast(s). SLNs were first identified and excised under intraoperative fluorescence detection, then assessed ex-vivo with Tc-99m/Gamma Probe and routine histology. The surgical field was then immediately reassessed with Tc-99m/Gamma Probe. Newly identified LNs ("Tc99m only") were excised and assessed ex-vivo with fluorescence and subsequent histology. Effectiveness was determined by comparing the proportion of LNs identified by SPY AGENT GREEN to the proportion identified by Tc-99m/Gamma Probe. The effectiveness of SPY-PHI/SAG in the identification of at least one LN per subject, and for intraoperative fluorescence visualization in delineation and mapping of lymphatic vessels aiding the identification of LNs were assessed. The safety of intradermal injection of SPY AGENT GREEN was also evaluated.

Results: Between February 2019 and September 2020, 152 subjects were enrolled. Three subjects were excluded from analysis due to unsuccessful mapping/SLNB with either technique. Outcomes from 148 subjects were analyzed. SPY-PHI/SAG identified 89% (360/406) while Tc-99m/Gamma Probe identified 66% (266/406) of histology confirmed LNs. Both methods identified at least one LN in 98% of subjects (145/148) and had equivalent per subject detection rates between SPY-PHI/SAG and Tc-99m/Gamma Probe. These results demonstrated that SPY-PHI/SAG were non-inferior to Tc-99m/Gamma Probe in the identification of histologically confirmed LNs in early-stage breast cancer (p-value < 0.0001). SPY-PHI/SAG lymphatic vessel mapping also aided operating surgeon in the visualization of 99% (357/360) LNs identified using SPY-PHI/SAG. Of the 406 LNs analyzed, there were 40 metastatic LNs confirmed in 29 of 148 subjects. Identification of at least one metastatic LN was detected in 93% of subjects using SPY-PHI/SAG versus 83% of subjects using Tc-99m/Gamma Probe. There were no adverse events or serious adverse events related to SPY-PHI/SAG. Conclusions. SPY-PHI and SPY AGENT GREEN are an effective modality for visualizing and identifying lymphatic nodes and vessels in early-stage breast cancer.

Conclusions: The FILM-B study confirms data suggesting ICG is non-inferior and in the study population, more accurate in identification of nodal metastasis in breast cancer surgery and sentinel lymph node biopsy. The FILM-B data led to first FDA approval for ICG (SPY AGENT GREEN) in sentinel node mapping and biopsy and provides a technique that is proven safe, accurate, surgeon controlled and fast acting which can improve both the logistics and accuracy of sentinel lymph node biopsy in breast cancer surgery.

1688178 - Predicting Nodal Positivity in Women 50-70 Years of Age with cT1N0 Estrogen Receptor-positive, HER2-negative Breast Cancer to Aid Implementation of the SOUND Trial into Clinical Practice

Dalliah Black, Courtney Day, Judy Boughey

Mayo Clinic, Rochester, MN

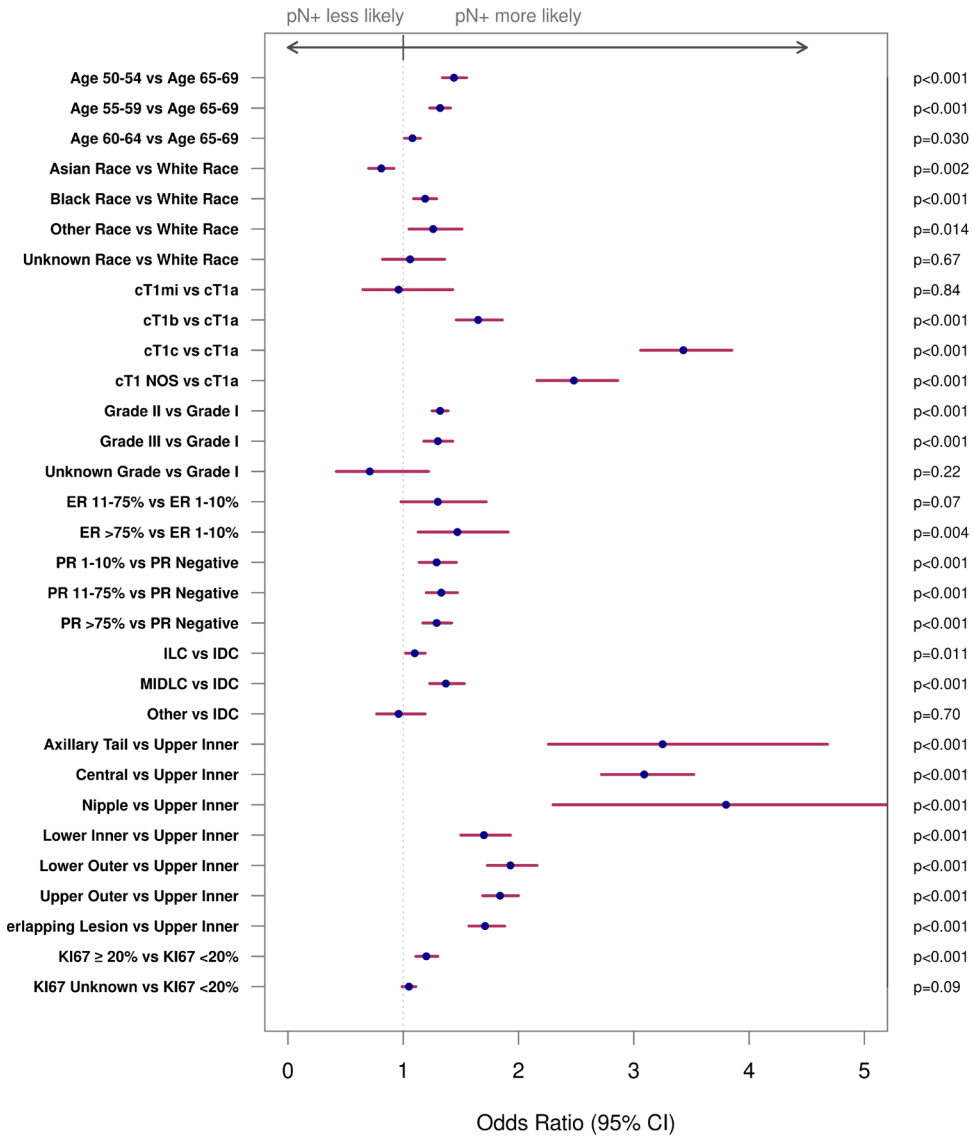
Background/Objective: Sentinel lymph node (SLN) surgery is standard of care for surgical axillary staging in breast cancer. The SOUND trial recently reported that SLN surgery may not be needed in patients age < 70 with negative axillary ultrasound, however reported a pathologic nodal positivity (pN+) rate of 14%. To aid physicians as they consider implementation of the SOUND trial into clinical practice, we sought to evaluate whether genomic testing influenced nodal positivity rate and further to identify clinicopathologic factors associated with pN+ in women 50-69 years of age with ER+/HER2- breast cancer and develop a predictive model to identify patients at higher risk for nodal metastasis.

Methods: Women 50-69 years of age with cT1N0, ER+HER2- breast cancer were identified from the National Cancer Database 2018-2020. We examined the impact of the 21-gene recurrence score (RS) as well as clinicopathologic features on nodal positivity. A predictive multivariable logistic regression model was developed to identify patients at risk for pN+ disease. The model development cohort was derived from a random 2/3 sample while the remaining 1/3 was used for model validation. The area under the curve (AUC) along with relative risks (RR) were performed to assess model performance.

Results: Among 83,542 cases, the pN+ rate was 13.5%. RS was available on 48,069 cases (58%). Mean RS was 16.2 in pN0 versus 15.9 for pN+ ($p=0.14$), however rate of pN+ was higher with low 21-gene RS (low RS 13.2% pN+, intermediate RS 12.5% pN+ and high RS 11.7% pN+, $p=0.016$). On MVA limited to patients with RS available, RS was not associated with pN+ disease ($p=0.71$). Therefore, RS was excluded from the model. Model development was performed using 55,922 cases and factors associated with pN+ status included younger age (50-54 years OR 1.44, 55-59 years OR 1.32, and 60-64 years OR 1.08 versus 65-69 years; each $p< 0.03$), black race (OR 1.19 versus white, $p< 0.001$), grade 2 and 3 (OR 1.32 and 1.30 versus grade 1, each $p< 0.001$), higher cT1 category (cT1b OR 1.65 and cT1c OR 3.43 versus cT1a, each $p< 0.001$), higher ER expression (>75% OR 1.47, $p=0.004$), progesterone receptor positivity (1-10% OR 1.29, 11-75% 1.33, and >75% 1.29 versus negative; each $p< 0.001$), retroareolar tumor location (OR 3.80 versus upper inner, $p< 0.001$), and Ki67 ≥20% (OR 1.20, $p< 0.001$). The predictive model had AUC 0.66 (0.65-0.66) and identified women with low prediction (< 10%) of pN+, of whom 6.9% were pN+ versus 17.3% in those with high predicted probability ≥10% (RR 2.5, $p< 0.001$). Model validation in 27,620 cases performed similarly with an AUC of 0.66 (0.65-0.67; $p=0.68$).

Conclusions: Clinicopathologic features including patient age, race, clinical T category, grade, Ki67, ER/PR expression, and tumor location are associated with nodal positivity in women 50-69 years of age with cT1N0, ER+HER2- breast cancer. The 21-gene RS is not associated with nodal positivity. This predictive model is able to identify women at high risk for nodal metastasis and may help multidisciplinary teams as they look to consider de-escalating SLN surgery in breast cancer.

Figure 1: Forest plot of predictors for nodal positivity in model development sample



1685877 - Does the Number of Removed Sentinel Lymph Nodes Matter?

Kathleen Stutz[1], Jesse Casaubon[2], Holly Mason[2], Shiva Niakan[2], Aixa Perez Coulter[2], Ann Friedrich[2]

[1]University of Massachusetts - Baystate, East Granby, CT, [2]University of Massachusetts - Baystate, Springfield, MA

Background/Objective: Sentinel lymph node biopsy (SLNB) is a procedure to provide staging information and guide treatment for patients with breast cancer, though not without risk. Axillary staging via SNLB involves preoperative injection of either a radioactive tracer, a dye or both to allow identification. We know negative consequences are associated with axillary lymph node (LN) removal proportional to the number of nodes removed. SLNB is not therapeutic, but the staging information gained can be valuable to guide adjuvant treatment. In this study we aim to analyze the impact of variations in surgical technique on the number of sentinel nodes removed and on complications associated with removal of a higher number of sentinel nodes.

Methods: This is a retrospective cohort analysis of patients with breast cancer who had lumpectomy and SLNB as first treatment between January 2018 and January 2023. The study was evaluated by the institutional IRB and found to be exempt. Patients were excluded if they had prior ipsilateral lymph node surgery, had ipsilateral breast, axillary, or chest wall radiation, underwent neoadjuvant chemotherapy or endocrine therapy or patients who underwent subsequent ALND. Variables including patient demographics, pre-operative workup, surgical technique, number of lymph nodes removed, and post-operative complications were collected. Complication rates were compared between less (1-3) and more (4+) sentinel lymph nodes removed. Statistical analysis was completed using T-test and Chi-square test.

Results: 643 patients met inclusion criteria. The range of sentinel lymph nodes removed was 1-11, with an average of 2.44 lymph nodes. Overall, dual tracer was used 90.9% of the time, the other patients received technetium only. An average of 2.5 lymph nodes were removed in patients where technetium and blue dye were both used, compared to an average of 2.0 lymph nodes removed with technetium alone ($p=0.05$). Performing breast massage after injection had no effect on the overall number of sentinel lymph nodes removed (2.4 nodes with massage vs. 2.6 nodes without, $p=0.12$). Of those who received blue dye, massage was performed 83.7% of the time. Massage was associated with a higher incidence of blue dye in the axilla (81% with massage vs 56.3% without, $p=0.001$). Overall complication rate was 19.8%, with a 4.4% lymphedema rate. There was a higher lymphedema rate among patients who had more nodes removed (7.6% with 4+ nodes removed vs 3.5% with 1-3 nodes removed, $p=0.04$). Other complications included cellulitis (27 patients, 4.2%), post-operative abscess (8 patients, 1.2%), arm stiffness (27 patients, 4.2%), axillary cording (23 patients, 3.6%) and post-operative hematoma (10 patients, 1.6%), but there were no statistically significant differences identified between the two groups. A clinically relevant increase in post-operative seroma was noted when patients had one incision compared with two separate incisions for their lumpectomy and SLNB (15.7% vs 9.8%, $p=0.22$).

Conclusions: The findings from this study suggest that surgical technique may impact the number of nodes removed, which may result in overtreatment of the axilla. This study also supports prior knowledge that removing fewer lymph nodes is associated with lower risk of lymphedema.

1684337 - Retrieval of the Axillary Clipped Lymph Node and Impact on Treatment Decisions

David Detz, Jr.[1], Diego Hanssen[2], Junmin Whiting[2], Weihong Sun[2], Brian Czerniecki[2], Susan Hoover[2], Nazanin Khakpour[2], John Kiluk[2], Christine Laronga[2], Melissa Mallory[2], Marie Lee[2], Laura Kruper[2]

[1]H. Lee Moffitt Cancer Center, Lutz, FL, [2]H. Lee Moffitt Cancer Center, Tampa, FL

Background/Objective: Prospective trials have demonstrated that "targeted axillary lymph node dissection (TAD)" [sentinel lymph node (SLN) biopsy and clipped lymph node (CLN) excision] lowers the false negative rates (FNR) after neoadjuvant chemotherapy (NAC) in clinically node positive patients (cN+) undergoing SLN biopsy. Studies have also demonstrated that the CLN was often not a SLN, which has implications for treatment decisions. We examined cN+ patients undergoing NAC and CLN localization to determine rate of CLN being a non-SLN, factors associated with cN+ to pN0 conversion and whether the status of the CLN impacted treatment recommendations.

Methods: Retrospective review of a single institution TAD database of NAC patients between 2016-2022 with cN+ disease confirmed by needle biopsy and receiving preoperative localization of a CLN was performed. Demographics, ER/PR Her2 receptor status, time from diagnosis to surgery, clinical and pathologic staging and node status, chemotherapy regimen, localization method, surgical pathology, treatment plan alterations based on CLN (cases where a + CLN with negative SLN led to completion axillary lymph node dissection or adjuvant chemotherapy), and adjuvant therapy were analyzed. We used univariate association and univariable logistic regression model analysis.

Results: 81 patients were analyzed. A pathologic complete response (pCR) of the CLN (cN+ to pN0 conversion) was noted in 41 patients (50.6%) with the following tumor markers: 18.8% of HR+/HER2, 75% of HR+/Her2+, 75% of HR-/HER2+, and 62.5% of triple negative breast cancer patients. (p-value = 0.006). The CLN = SLN in 68 (84%) patients, while the CLN was a non-SLN in 13 (16%). CLN had no impact on the final treatment plan in 67 (82.7%) patients; in 14 (17.3%) cases, the final treatment plan was altered based on CLN status: 11 pts underwent ALND and 3 pts had systemic treatment changes. There were 2 cases where the final treatment plan was altered based on positive non-sentinel CLNs. A total of 20 patients underwent completion ALND for residual nodal disease.

Conclusions: In this NAC population, there was a significant difference in pCR rates, with the highest conversion rates in HER-2 positive disease and lowest in HR+/HER2- disease. The CLN was a non-SLN in 16% of patients and a +CLN impacted the final treatment plan in almost 17% of cases. Our data demonstrates that a +CLN altered final treatment plans, and in some cases represent patients who would have been undertreated by SLN biopsy without TAD.

Table 1: Univariable logistic regression model analysis of cN+ to pN0 conversion

			cN+ to pN0 conversion=Yes		
Covariate	**Level**	**N**	**Odds Ratio (95% CI)**	**OR P-value**	**Overall P-value**
PR	Negative	48	2.67 (1.07-6.67)	**0.035**	**0.035**
	Positive	33	-	-	
Her2neu IHC	Positive	24	4.38 (1.37-14.02)	**0.013**	**0.023**
	Equivocal	16	0.88 (0.26-3.01)	0.835	
	Negative	32	-	-	
Tumor subtype	HR+/HER2+	16	13.00 (2.40-70.46)	**0.003**	**0.013**
	HR-/HER2+	8	13.00 (1.70-99.37)	**0.013**	
	TNBC	16	7.22 (1.44-36.22)	**0.016**	
	Other	25	2.89 (0.65-12.80)	0.163	
	HR+/HER2-	16	-	-	
Chemotherapy regimen	TCHP	25	4.06 (1.43-11.55)	**0.009**	**0.029**
	Other	7	2.11 (0.42-10.46)	0.363	
	ACT	49	-	-	
path T stage	ypT1mi-ypT1	31	0.09 (0.03-0.32)	**<.001**	**<.001**
	ypT2-ypT3	16	0.01 (0.00-0.11)	**<.001**	
	ypTis-ypT0	34	-	-	
pCR breast	Yes	34	16.92 (5.34-53.62)	**<.001**	**<.001**
	No	47	-	-	
ER		81	0.31 (0.11-0.86)	**0.025**	**0.025**
PR		81	0.12 (0.02-0.66)	**0.015**	**0.015**
Number nodes removed		81	0.81 (0.71-0.92)	**0.001**	**0.001**

1687963 - Predictors of Pathologic Nodal Complete Response after Neoadjuvant Chemotherapy in Patients with T3 and T4 Breast Cancer: Expanded Options for Targeted Axillary Dissection

Rachel Wobig[1], Jessica Bensenhaver[2], Courtney Rose[2], Katie Latack[2], Lindsay Petersen[2], Anna Lehrberg[2], Laura Dalla Vecchia[2], Theresa Schwartz[2]

[1]Henry Ford, Royal Oak, MI, [2]Henry Ford, Detroit, MI

Background/Objective: Targeted axillary dissection (TAD) is an alternative to axillary lymph node dissection (ALND) for clinically node positive patients who have an excellent response to neoadjuvant chemotherapy (NAC). It is useful to predict which patients are likely to have a complete nodal response to determine who may be staged with TAD alone. While TAD is commonly performed in patients with initially node positive T1/T2 disease after NAC, its validity in those with T3/T4 tumors is less defined. We aim to evaluate the predictive factors for pathologic nodal response in patients with T3 or T4 tumors to identify those who may be safely spared ALND.

Methods: Using our IRB approved prospectively maintained institutional database, all women with T3 or T4(abcd), node positive disease who underwent NAC from 2012-2022 were identified. We excluded those with incomplete data, those who did not undergo a definitive operation and those with metastatic disease at the time of diagnosis. Clinicopathologic features were reviewed, notably age at diagnosis, clinical stage, ER/PR/Her2 status and pathologic stage after NAC. Using SAS Studio 3.81, Fisher Exact Test was used to investigate an association between the variables and pathologic stage.

Results: A total of 81 patients met inclusion criteria. Of these, 12 were cT4d, 24 were T4abc and 45 were cT3 at diagnosis. There were no statistically significant differences in ER/PR/Her2 status between the cT4d or the T4abc patients who had a complete pathologic nodal response and those who did not. However, there was an association found between pathologic nodal response and ER status and Her2 status in the patients with cT3 disease. The proportion of patients with ER negativity was greater in the patients with a complete nodal response compared to those with an incomplete nodal response (69.2% ER negative had a complete nodal response, p=0.0067). The proportion of patients with Her2 positive disease was greater in those with a complete nodal response (65.4% Her2 positive had a complete nodal response, p=0.0059). When the ER/PR/Her2 results were grouped, the proportion of cT3 patients with ER/PR negative, Her2 positive disease was greater in those with a complete nodal response (38.5%) compared to those with an incomplete nodal response (0%, p=0.0024). No statistically significant differences were seen in pathologic nodal response based on age in any of the subsets (under 50 vs 50+ years).

Conclusions: Following NAC, an association is seen between pathologic nodal response and ER/PR/Her2 status in patients with initially node positive, cT3 disease. Patients with ER/PR negative, Her2 positive cT3 disease are significantly more likely to achieve a complete pathologic nodal response after NAC. Although this study is limited in numbers and a larger study would be helpful to validate our results, our study suggests that the use of TAD alone could be expanded to those with cT3 disease for surgical nodal staging after NAC, especially the ER/PR negative, Her2 positive cohort.

Table 1: Predictors of pathologic nodal complete response after neoadjuvant chemotherapy

T3ABC Patients				
		Path Response		
	Total (N=45)	Complete (N=26)	Incomplete (N=19)	P-value
Clinical Stage, n (%)				0.5957[1]
cT3N1	40 (88.9%)	24 (92.3%)	16 (84.2%)	
cT3N2	4 (8.9%)	2 (7.7%)	2 (10.5%)	
cT3N3	1 (2.2%)	0 (0.0%)	1 (5.3%)	
Estrogen Receptor, n (%)				**0.0067[1]**
Positive	22 (48.9%)	8 (30.8%)	14 (73.7%)	
Negative	23 (51.1%)	18 (69.2%)	5 (26.3%)	
Progesterone Receptor, n (%)				0.0571[1]
Positive	14 (31.1%)	5 (19.2%)	9 (47.4%)	
Negative	31 (68.9%)	21 (80.8%)	10 (52.6%)	
Her2, n (%)				**0.0059[1]**
Positive	21 (46.7%)	17 (65.4%)	4 (21.1%)	
Negative	24 (53.3%)	9 (34.6%)	15 (78.9%)	
ER/PR/Her2, n (%)				**0.0024[1]**
-/-/+	10 (22.2%)	10 (38.5%)	0 (0.0%)	
Other	35 (77.8%)	16 (61.5%)	19 (100.0%)	
Age at diagnosis, n (%)				1.0000[1]
Under 50	14 (31.1%)	8 (30.8%)	6 (31.6%)	
50+	31 (68.9%)	18 (69.2%)	13 (68.4%)	

[1]Fisher Exact p-value;

1688587 - Should Frozen Section Analysis Be Routinely Utilized in cN1 Breast Cancer Patients After Neoadjuvant Chemotherapy? A Retrospective Review.

Madeline Higgins[1], David Chen[2], Salvador Rodriguez-Franco[3], Colleen Murphy[2], Nicole Christian[1], Sarah Tevis[1], Gretchen Ahrendt[1]

[1]University of Colorado School of Medicine, Aurora, CO, [2]University of Colorado School of Medicine, Denver, CO, [3]University of Colorado Anschutz Medical Campus, Aurora, CO

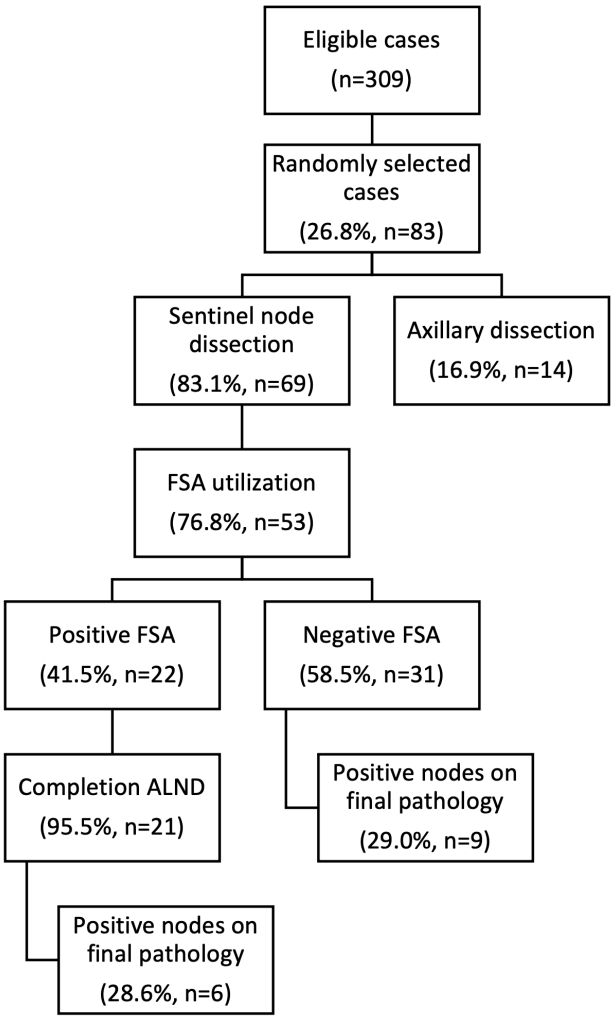
Background/Objective: Level 1-2 axillary node dissection (ALND) remains the standard of care for breast cancer patients with persistently positive nodes after neoadjuvant chemotherapy (NAC). However, in patients with cN1 staging, there is often minimal residual axillary nodal burden identified with sentinel node dissection, calling into question the need for the morbid ALND. With a focus on de-escalation of axillary management, this study aimed to assess the utilization of intra-operative frozen section analysis (FSA), the management of persistently positive nodes on FSA, and pathological outcomes for cN1 patients undergoing sentinel node dissection (sentinel node biopsy and targeted axillary dissection) after NAC at a comprehensive cancer center.

Methods: This was a retrospective review of a prospectively maintained single-institution database of patients diagnosed with cT1-3N1-2M0 breast cancer treated with NAC from January 2017 to October 2023. Relevant clinicopathologic information was reviewed including nodal stage, operation performed, utilization of FSA, management of positive lymph nodes, final pathological findings, and management following surgery. Descriptive statistics and univariable analyses were performed on sentinel node dissection procedures along with utilization of FSA and lymph node positivity.

Results: 83 cases of 309 meeting eligibility were randomly selected from the database and included in the analysis (Figure 1). The median age was 52 years (range 29-76 years), and initial axillary operation was a sentinel node dissection in 83.1% of cases (69/83) with most patients presenting with cN1 disease (84.1%) based on imaging and clinical exam. FSA utilization was 76.8% (53/69) with a median retrieval of 4 lymph nodes during sentinel node dissection (range 1-12 lymph nodes). Persistently positive nodes were found with FSA in less than half of patients (22/53, 41.5%) leading to completion ALND in 95.5% of cases (21/22). During completion ALND, median retrieval of 14 lymph nodes was observed (range 3-24 LN); however, additional positive lymph nodes were found in only 28.6% of cases (6/21). Notably, 71.4% of completion ALND cases did not identify additional positive lymph nodes. Regarding cases with negative FSA, final pathology was positive in 29.0% (9/31). These cases had a median of 2 positive lymph nodes (range 1-3), and less than a third had at least one lymph node with macro metastases. After multidisciplinary discussion, all these patients were managed non-operatively with the majority receiving adjuvant radiation (77.78%).

Conclusions: These preliminary results suggest that in cN1 patients the majority of persistently positive lymph nodes are identified by sentinel node dissection. While axillary dissection remains the standard of care for these patients, the majority of patients do not have additional positive nodes. Utilization of ALND for patients with low volume nodal disease after NAC is declining. These findings suggest that routine use of frozen section may lead to over-utilization of axillary dissection. Further work will need to be done to corroborate these results in a larger dataset, and to identify predictors of low-volume residual nodal disease, in combination with the results of ongoing randomized clinical trials in this area.

Figure 1: Schematic of data analysis



1639031 - Axillary Management in Triple-negative Breast Cancer: A National Analysis of De-escalation Following Neoadjuvant Chemotherapy

Samir Mitri[1], Estefania Roldan-Vasquez[1], Shreya Bhasin[2], Giulia Borgonovo[1], Roger Davis[1], Ted James[1]

[1]Beth Israel Deaconess Medical Center, Boston, MA, [2]Beth Israel Deaconess Medical Center, New York, NY

Background/Objective: The selective omission of axillary lymph node dissection (ALND) in conjunction with neoadjuvant chemotherapy (NCT) represents a significant shift in breast cancer management. Despite the growing acceptance, its adoption is not universal, leading to variations in patient care. Triple-negative breast cancer (TNBC), known for its high response rate to NACT, presents a compelling case for axillary de-escalation. This study seeks to determine factors influencing the alignment of clinical practice with advances in axillary management.

Methods: A retrospective analysis was conducted using the National Cancer Data Base (NCDB) to evaluate patients diagnosed with clinically node-positive, triple-negative invasive breast cancer, who underwent neoadjuvant chemotherapy followed by axillary surgery between 2012 and 2017. Assessment was performed to identify differences between patients with complete nodal response (ypN0) who underwent axillary lymph node dissection (ALND) and those with ypN0 who omitted ALND. Descriptive statistics were used to examine practice trends, Chi-square tests to assess categorical differences, and logistic regression to identify factors influencing the use of ALND or omission in the context of ypN0 disease.

Results: The cohort consisted of 17,452 women who underwent NCT followed by ALND. From this set of patients, 4,764 (27.30%) achieved nodal pCR. Treatment at an academic facility was associated with ALND in the settings of ypN0 diseases. Patients with private insurance, public insurance, or higher income were less likely to undergo ALND compared to sentinel lymph node biopsy/targeted axillary dissection for ypN0 disease.

Conclusions: Patients who exhibit nodal pCR following NCT may still undergo ALND, thereby exposing them to the potential morbidity associated with this procedure. This finding underscores the necessity to explore and overcome barriers hindering the adoption of alternative axillary management strategies, especially in patients with TNBC, who are often suitable candidates for axillary de-escalation.

1662579 - Management of Clinically Positive Axilla After Neoadjuvant Therapy: Clinical Practice Survey Among Surgeons in Mexico

Paulina Bajonero-Canonico[1], Maria Teresa Mireles-Aguilar[2], Guillermo Gerardo Peralta Castillo[1], Carlos De la cruz[3], Bertha Alejandra Martinez-Cannon[4]

[1]Cancer Center Tec 100 Queretaro, Queretaro de Arteaga, Mexico, [2]Centro de Cancer de Mama Tecnológico de Monterrey, Nuevo Leon, Mexico, [3]Universidad de Monterrey, Christus Muguerza, Monterrey, Nuevo Leon, Mexico, [4]Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran, Ciudad de Mexico, Distrito Federal, Mexico

Background/Objective: Axillary dissection (AD) has been the treatment and staging procedure of choice for patients with a clinically positive axilla. As better responses to neoadjuvant chemotherapy (NAC) have been demonstrated, in many cases, axillary surgery can be de-escalated using sentinel lymph node biopsy (SLNB) or targeted axillary dissection (TAD). However, the uptake of these procedures varies around the world and is unknown in Mexico. Thus, we sought to investigate what is the currently preferred axillary surgery by Mexican surgeons for breast cancer patients with clinically positive axilla (cN1) who received neoadjuvant chemotherapy.

Methods: We conducted an electronic survey to assess the preferred axillary staging method. Additionally, we examined whether individual factors such as surgeon experience, practice type and familiarity with clinical studies regarding TAD and SLNB following NAC, correlated with the choice of surgical approach. We also sought to identify perceived barriers to the adoption of these techniques. The survey was administered via Google Forms and was distributed through social media, email, and WhatsApp groups between April and June 2023.

Results: Sixty surgeons participated in the survey. Characteristics are shown in Table 1. Among respondents, 23.3% of reported that their standard approach for cN1 breast cancer patients who received NAC is AD, 23.3% SLNB, 28.3% TAD, and 25% chose between SLNB or TAD depending on the patient. These results were categorized into two groups: the AD group and the no AD group (SLNB and/or TAD). Surgeons who performed AD were more likely to work in a public institution (50% vs 6.5% P=0.001) and were less familiar with TAD studies (57.1% vs. 26.1%, P=0.035). Remarkably, none of the surgeons in the AD group altered their clinical practices after learning about TAD and SLNB studies, and 14.3% expressed no intention to make changes (P< 0.001). Surgeon age, years of experience, annual case volume, and multidisciplinary case discussions were not significantly associated to any particular type of surgery. The most important perceived barriers for the implementation of SLNB or TAD included a lack of resources in institutions (78.6%) and concerns about long-term oncological outcomes (21.4%).

Conclusions: This study offers a valuable insight of the current clinical practice among Mexican surgeons in the management of patients with cN1 breast cancer after NAC. These findings indicate that while a relevant proportion of surgeons in Mexico have adopted less invasive axillary staging methods, almost a quarter still opt for AD. Lack of resources is the most common barrier followed by lack of knowledge of the clinical studies on the feasibility and effectiveness of TAD and SLNB. Understanding these clinical behaviors and limitations is essential for designing interventions aimed at improving the quality of breast cancer care in Mexico.

Table 1. Physicians' baseline characteristics

Variable	Overall	No AD	AD	P
Age*	37.5 (35-42)	37.5 (34.7-42)	38.5 (34.7-55.5)	0.448
Age group				0.272
30-45 years	45 (80.4%)	35 (83.3%)	10 (71.4%)	
>45 years	11 (19.6%)	7 (16.7%)	4 (28.6%)	
Specialty				0.017
General surgeon with BC fellowship	12 (21.4%)	11 (26.2%)	1 (7.1%)	
Oncologic surgeon	29 (51.8%)	21 (50%)	8 (57.1%)	
Gynecologist with BC fellowship	7 (12.5%)	7 (16.7%)	0 (0%)	
Gynecologic oncologist	8 (14.3%)	3 (7.1%)	5 (35.7%)	
Type of clinical practice	-	-		0.001
Public	10 (17.9%)	3 (7.1%)	7 (50%)	
Private	23 (41.1%)	21 (50%)	2 (14.3%)	
Both	23 (41.1%)	18 (42.9%)	5 (35.7%)	
Frequent multidisciplinary sessions	-	-		0.152
Yes, all cases	18 (32.1%)	16 (38.1%)	2 (14.3%)	
Some cases	29 (51.8%)	21 (50%)	8 (57.1%)	
None	9 (16.1%)	5 (11.9%)	4 (28.6%)	
Years of experience	-	-		0.47
≤5 years	29 (51.8%)	23 (54.8%)	6 (42.9%)	
6-10 years	15 (26.8%)	11 (26.2%)	4 (28.6%)	
11-20 years	6 (10.7%)	5 (11.9%)	1 (7.1%)	
>20 years	6 (10.7%)	3 (7.1%)	3 (21.4%)	
Experience in BC surgical cases	-	-		0.405
0-20 cases	18 (32.1%)	15 (35.7%)	3 (21.4%)	
21-50 cases	18 (32.1%)	14 (33.3%)	4 (28.6%)	
>50 cases	20 (35.7%)	13 (31%)	7 (50%)	
Approximate institutional annual BC surgical cases	-	-		0.618
0-20 cases	7 (12.5%)	6 (14.3%)	1 (7.1%)	
21-50 cases	3 (5.4%)	2 (4.8%)	1 (7.1%)	
50-100 cases	17 (30.4%)	11 (26.2%)	6 (42.9%)	
>100 cases	29 (51.8%)	23 (54.8%)	6 (42.9%)	

AD: axillary dissection; BC: breast cancer.
*Median (interquartile range).

1688188 - Outcomes and Trends in Axillary Management of Stage cN3b Breast Cancer Patients

Zachary Schrank[1], Chris Agala[2], David Ollila[2], Kristalyn Gallagher[2], Dana Casey[2], Philip Spanheimer[2], Julia Selfridge[2]

[1]UNC School of Medicine, Chapel Hill, NC, [2]UNC Hospitals, Chapel Hill, NC

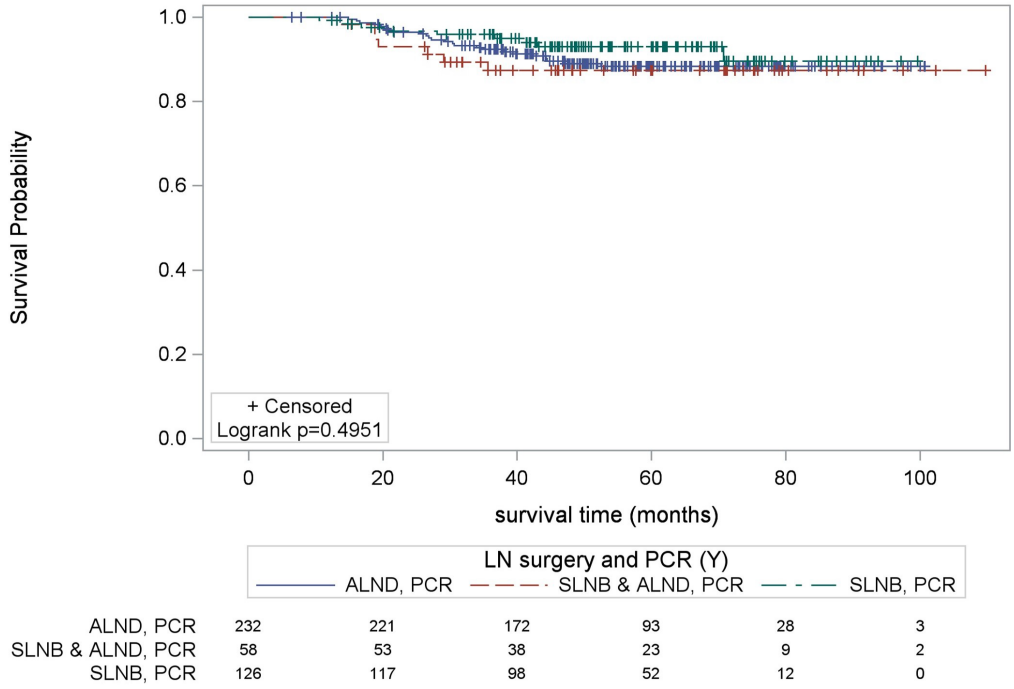
Background/Objective: Use of sentinel lymph node biopsy (SLNB) after neoadjuvant systemic therapy has increased over the past decade for cN1 breast cancer, sparing patients the morbidity of axillary lymph node dissection (ALND). However, there is limited data regarding the use and outcomes of these de-escalated procedures for cN3b patients who present with both axillary and ipsilateral internal mammary node involvement. We aimed to examine rates of nodal clearance, trends in the use of SLNB, and to compare the overall survival of cN3b patients by response and axillary procedure.

Methods: Adult women diagnosed with non-metastatic cN3b invasive breast carcinoma between 2010 and 2019 were selected from the National Cancer Database. These patients were compared based on use of neoadjuvant systemic therapy and axillary surgery, specifically SLNB, SLNB with ALND, and ALND only. Overall survival was evaluated between these groups, with particular focus on patients with nodal pCR. Kaplan-Meier analyses were used to compare overall survival for the different surgical groups that had achieved nodal pCR.

Results: In total, we included 2124 patients with cN3b disease. Age at diagnosis was similar across groups, with median age 52.1 years overall. Most tumors in each group were cT2 (32% of ALND only patients, 40.8% of SLND + ALND patients, and 51.0% of SLNB patients), but cT4 tumors were more common in the ALND only group (29.8% vs 18.4% of SLNB + ALND patients and 12.5% of SLNB patients). Distribution of receptor subtypes were similar across groups for triple negative breast cancer (30.9% of ALND patients, 26.6% SLNB + ALND, and 34.6% SLNB). HER2 positive patients were similarly represented (31.9% of ALND patients, 27.9% SLNB+ALND, and 32.6% SLNB only). In 2012, 8.8% of these patients underwent SLNB alone and 17.6% underwent SLNB followed by ALND. In 2019, this had risen to 21.1% for SLNB alone and 23.0% for SLNB with subsequent ALND ($p< 0.0001$). Most patients in each group received neoadjuvant chemotherapy (87% in ALND only, 82.7% in SLNB + ALND, 90.8% in SLNB only) and adjuvant radiation (84.1% in ALND only, 89.7% in SLNB + ALND, 85.6% in SLNB only). 417 patients total were found to have a nodal PCR. Rate of nodal pCR was highest in the SLNB group (36.3%) compared to ALND and SLNB + ALND (17.1% and 13.9%, respectively). Median overall survival of patients receiving SLNB with nodal pCR (53.1 months) or SLNB + ALND (48.8 months) was not statistically significantly different from the ALND only group with pCR (54.6 months) ($p= 0.665$ and 0.999, respectively, Figure 1).

Conclusions: There has been increasing use of surgical de-escalation procedures for the axillary management of cN3b breast cancer over the past decade. In patients with nodal PCR, SLNB alone was not associated with reduced survival. For select cN3b patients with an excellent clinical response to neoadjuvant systemic therapy, axillary de-escalation strategies, such as sentinel lymph node biopsy with omission of completion axillary dissection in the setting of a nodal PCR, may be considered.

Figure 1: Overall survival by lymph node surgery and PCR (n = 417) with number of subjects at risk



ALND, PCR	232	221	172	93	28	3
SLNB & ALND, PCR	58	53	38	23	9	2
SLNB, PCR	126	117	98	52	12	0

Figure 1: Overall survival for patients with nodal pathologic complete response treated with sentinel lymph node biopsy (SLNB), SLNB with axillary lymph node dissection (ALND), and ALND alone.

1687377 - Patient-reported Practical Concerns and Surgical Delays in Breast Cancer

Brienne Donovan[1], Mary Pronovost[2], Dianelys Tabla Cendra[3], Claire Miller[1], Jingwei Wu[4], Aliza Abezis[3]

[1]Temple University Health System, Philadelphia, PA, [2]Temple University Hospital, Philadelphia, PA, [3]Lewis Katz School of Medicine at Temple University, Philadelphia, PA, [4]Temple University, Philadelphia, PA

Background/Objective: Time from tissue diagnosis to surgery is known to be important for survival in breast cancer as longer times to surgery have been associated with decreased overall and disease-specific survival. Unfortunately, delays in care are common. Several tools have been developed to screen for distress in cancer patients, with the goal of identifying stressors that could be acted upon and potentially mitigated by a multi-disciplinary care team. In this study, we aimed to investigate the relationship between patient-reported stressors and concerns regarding their cancer diagnosis and delays from diagnosis to surgery.

Methods: We performed a retrospective chart review of all patients with new diagnoses of breast cancer who underwent mastectomy or breast-conserving surgery at an urban academic center between January 2017 and May 2022. Patients were asked to complete a modified version of the National Comprehensive Cancer Network Distress Thermometer and Problem List pre- and post-operatively. The survey included questions about housing security, insurance or finances, access to transportation, and worries about work or school. The primary outcome was the time from biopsy to surgery. Patients were excluded if they had received neoadjuvant therapy. Patient demographics and cancer characteristics were recorded, including age, race, insurance type, and cancer stage.

Results: 252 breast cancer patients were included in the analysis; 136 (54.0%) patients were Black, 71 (28.2%) were Non-Black Hispanic, and 35 (13.9%) were White. The mean time from biopsy to surgery was 61.7 days, while the median time to surgery was 43 days. There were no significant differences in time to surgery based on type of insurance or cancer stage. The median time to surgery was 38 days for White patients versus 42 days for Black patients and 44 days for Non-Black Hispanic patients (p=0.0475). Of the 46 patients who completed a preoperative distress survey, 5 (10.9%) reported issues with housing, 10 (21.7%) reported problems with insurance or finances, 6 (13.0%) had difficulty with transportation, and 3 (6.5%) had problems with work or school. 238 patients completed a postoperative distress survey, of whom 17 (7.1%) had housing problems, 48 (20.2 %) had financial or insurance issues, 45 (18.9%) had difficulty with transportation, and 18 (7.6%) had concerns about work or school. None of these practical concerns were associated with longer times to surgery.

Conclusions: While issues with finances and transportation were commonly reported in our population, these and other practical concerns were not associated with longer times to surgery. Black and Non-Black Hispanic patients had significantly longer times to surgery compared to White patients. Further studies are needed to identify risk factors for delays in time to surgery in urban breast cancer patients.

1688601 - Surgeon-ordered Genomic Testing Decreases Turnaround Time

Trevor Roush[1], Aiello Caterina[1], Susan Boolbol[2], Carinne Anderson[1]

[1]Nuvance Health, Danbury, CT, [2]Nuvance Health, Poughkeepsie, NY

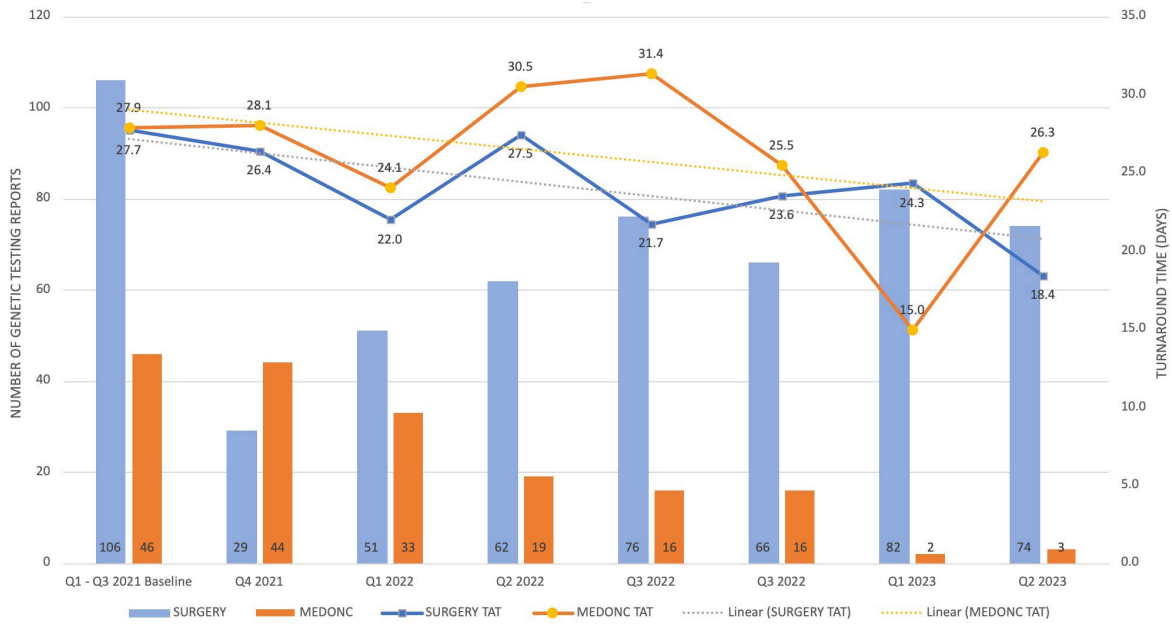
Background/Objective: Level 1 evidence supports the use of genomic assays for women with early-stage, hormone receptor positive, HER2 negative breast cancer to provide prognostic and therapy predictive information. Assay results are used to determine the need and benefit of chemotherapy. Delays in obtaining results can serve as a source of stress as patients await a final treatment plan. Because the results of genomic testing affect systemic therapy regimens, the historical practice at our institution has been for medical oncology to order genomic testing following the release of pathology reports. This would occur after pathology reports are forwarded to the oncology practice group post-operatively. As surgeons are often the first to obtain the pathology reports, we implemented a protocol for the operative surgeon to order genomic testing following the release of pathology report.

Methods: Using a 21-gene recurrence score (Oncotype DX®) across a seven-hospital system, turnaround times (TAT) from timeframe of Q1 through Q3 of 2021 were established between breast surgeons and medical oncologists from the release date of the pathology reports following breast surgery until the release of the genomic testing reports. A protocol was established for the operative surgeon to order genomic testing following the release of the pathology report, based on established criteria. Data was then collected on a quarterly basis from Q4 2021 through Q2 2023 and summated between breast surgery and medical oncology with TAT calculated using weighted averages between groups.

Results: Amongst breast surgeons, from Q4 2021 thru Q2 2023, TAT for genomic testing results decreased from 27.7 days to 18.4 days, while average number of quarterly reports from 2022 to 2023 increased from 63.8 to 78 reports. Across the same time period, TAT amongst medical oncology decreased from baseline 27.9 days to 26.3 days. Chi-squared analysis comparing TAT between breast surgeons and medical oncology of most recent Q2 2023 TAT demonstrated significant difference between TAT of breast surgery and medical oncology ($p < .0001$).

Conclusions: Implementation of the standardized practice for the operative surgeon to order genomic testing following the release of the pathology report has led to a significant decrease in TAT of genomic testing results, by 7.9 days. The increase in volume in reports ordered amongst breast surgeons has not adversely affected TAT. This protocol can easily be implemented and replicated at other institutions to decrease the time from surgery until final treatment plan.

Figure 1: Volume and turnaround time (TAT) of breast surgery and medical oncology from date pathology report is available until obtaining genomic testing results



1688624 - Fragmentation of Care in Breast Cancer: Putting the Pieces Together

Hadley Freeman[1], Halley Vora[2], Rhami Khorfan[2], Ashley Wilbers[3], Linnea Burke[2], Ja'Neil Humphrey[2], Naveenraj Solomon[2], Jukes Namm[2], Liang Ji[2], Sharon Lum[2]

[1]LLUH, Loma Linda, CA, [2]Loma Linda University Medical Center, Loma Linda, CA, [3]Washington University School of Medicine, St. Louis, MO

Background/Objective: Fragmentation of care (FC, the receipt of care at >1 institution) has been shown to negatively impact cancer treatment and outcomes, including time to definitive treatment and survival, in certain malignancies. Due to the multimodal nature of breast cancer treatment delivered across multiple settings, we sought to identify factors associated with FC and time to treatment, and determine independent effects on survival of breast cancer patients.

Methods: A retrospective analysis was performed of adult patients with stage I-III breast cancer who received definitive surgical management using the National Cancer Database (NCDB) from 2004 to 2020, excluding neoadjuvant therapy recipients. Patients were stratified based on whether diagnosis and surgery were performed at one versus multiple facilities. Delay in treatment was defined using the Commission on Cancer timeliness quality measure as surgery > 60 days after diagnosis. Multivariable logistic regression was performed to identify factors predictive of delay in treatment, and Cox proportional hazards model was used to compare survival.

Results: A total of 536,548 patients were identified: 531,644 (99.1%) were female. Overall, 193,337 (36.0%) received all care at a single facility, while 343,211 (64.0%) received FC. Delay in treatment was observed more frequently in patients with FC (12.1% vs 9.9%, $p< 0.001$). The proportions of patients of different race and ethnicity groups, insurance types, and facility type varied significantly between FC and non-FC cases (see Table). After adjustment, FC (OR 1.27, 95% CI 1.25-1.29) was independently associated with treatment delay. Additionally, treatment at academic/research programs (OR 1.80, 95% CI 1.73-1.87), integrated network cancer programs (OR 1.42, 95% CI 1.36-1.48) and comprehensive community cancer programs (OR 1.17, 95% CI 1.13-1.22) were associated with increased likelihood of treatment delay compared to community cancer programs. Delay in treatment > 60 days was independently associated with increased risk of mortality (HR 1.23, 95% CI 1.20-1.26). Conversely, treatment at academic/research programs (HR 0.80, 95% CI 0.78-0.82), integrated network cancer center programs (HR 0.90, 95% CI 0.88-0.93) and comprehensive community cancer programs (HR 0.93, 95% CI 0.91-0.95), as well as FC (HR 0.87, 95% CI 0.86-0.88) were independently associated with improved survival.

Conclusions: Fragmentation of care has complex implications on breast cancer treatment delays and outcomes. Our findings suggest that although treatment delay negatively impacts survival, favorable factors regarding treatment location in multiple settings and care coordination may mitigate some of these effects.

Table 1.

Variable	Fragmented care N= 343,211	Treatment at one facility N= 193,337	p value	Odds ratio treatment delay	95% CI	Hazard ratio overall survival	95% CI
Mean age (yr)	63.2	65.4	<0.0001	0.99	0.99-0.99	1.07	1.07-1.07
Race and ethnicity							
Asian/Other	4.2%	3.8%	<0.0001	1.25	1.20-1.31	0.71	0.68-0.75
Non-Hispanic Black	8.4%	10.7%		1.82	1.77-1.87	1.08	1.05-1.10
Hispanic	4.9%	4.3%		1.82	1.76-1.88	0.73	0.70-0.76
Non-Hispanic White	82.5%	81.2%		Ref		Ref	
Insurance status							
Not Insured	1.1%	1.5%	<0.0001	1.72	1.62-1.83	1.50	1.40-1.61
Private Insurance/Managed Care	49.8%	43.6%		Ref		Ref	
Medicaid	4.8%	5.2%		1.88	1.82-1.94	1.75	1.69-1.82
Medicare	43.2%	48.9%		1.11	1.08-1.14	1.18	1.16-2.21
Other Government	1.1%	0.8%		1.30	1.20-1.41	1.19	1.10-1.29
Treating facility type							
Community Cancer Program	7.2%	8.2%	<0.0001	Ref		Ref	
Comprehensive Community Cancer Program	42.4%	44.9%		1.17	1.13-1.22	0.93	0.91-0.95
Academic/Research Program	28.1%	30.7%		1.80	1.73-1.87	0.80	0.78-0.82
Integrated Network Cancer Program	22.4%	16.2%		1.42	1.36-1.48	0.90	0.88-0.93
AJCC stage							
I	73.3%	74.1%	<0.0001	Ref		Ref	
II	24.6%	23.8%		1.15	1.13-1.18	1.80	1.77-1.82
III	2.1%	2.2%		1.15	1.09-1.22	3.46	3.36-3.56
Receptor status							
HR+HER2+	5.1%	4.8%	<0.0001	1.00	0.96-1.04*	1.21	1.18-1.24
HR+HER2-	83.1%	82.4%		Ref		Ref	
HR-HER2+	2.6%	2.7%		0.88	0.83-0.92	1.24	1.20-1.29
Triple Negative	9.3%	10.1%		0.74	0.72-0.76	1.62	1.59-1.66
Charlson-Deyo Score							
0	82.2%	79.1%	<0.0001	Ref		Ref	
1	13.9%	15.6%		1.06	1.04-1.09	1.44	1.41-1.46
2	2.8%	3.7%		1.24	1.18-1.30	2.09	2.03-2.15
3	1.1%	1.7%		1.48	1.38-1.58	3.01	2.90-3.13
Delayed treatment							
≤60d	87.9%	90.1%	<0.0001			Ref	
>60d	12.1%	9.9%				1.23	1.20-1.26
Fragmented care							
Yes				1.27	1.25-1.29	0.87	0.86-0.88
No				Ref		Ref	

1688084 - Factors Contributing to Delay in Surgery in Early-stage Breast Cancer Patients

Jenna Mancinelli[1], Krystal Hunter[2], Grace Nesheiwat[3], Maureen Romero[2], Andrea Nicholson[4], Adrian Lopez[2], Teralyn Carter[2], Michele Fantazzio[2], Kahyun Yoon-Flannery[2]

[1]Cooper University Hospital, Cherry Hill, NJ, [2]Cooper University Hospital, Camden, NJ, [3]Philadelphia College of Osteopathic Medicine, Philadelphia, PA, [4]MD Anderson Cancer Center at Cooper, Camden, NJ

Background/Objective: Treatment delays have been associated with worse outcomes in early breast cancer patients. Commission on Cancer (CoC) recently instituted a new quality metric to measure adherence of upfront surgery being performed within sixty days of diagnosis in appropriate breast cancer patients. In this study, we aimed to identify factors potentially contributing to delay in surgery for early-stage breast cancer patients.

Methods: We conducted a retrospective cohort study of 1927 patients with Stage 0 to 3 breast cancer diagnosed and treated with upfront surgery between 2018 and 2022. We measured our average time interval (TI) to surgery, as well demographic and institutional factors including age, race, insurance status, clinical stage, and surgical options.

Results: We found that the median TI was 51 days [Range: 36, 70] at our institution. Of the 1927 subjects, 64% had a TI < 60 days and 36% had a TI > 60 days. The factors associated with increased TI were age ($p < 0.001$), Hispanic ethnicity ($p = 0.015$), insurance status ($p=0.014$), clinical stage ($p=0.005$), and those undergoing mastectomy ($p< 0.001$). We did not find any significant difference in those diagnosed at an outside institution or based on receptor status. There was no statistically significant difference in upgrade from clinical to pathologic stage at time of surgery between the cohorts ($p=0.065$) (Table).

Conclusions: Decisions leading up to definitive surgical management of breast cancer are complex. Our findings suggest that there may be further delay to surgery based on age, race and surgical options. There remains room for improvement to facilitate a higher percentage of patients achieving the goal of having surgery within 60 days of their diagnosis.

Figure 1: Demographic and institutional factors' relationship with timeliness to surgery

	Diagnosis to Surgery < 60 Days			Diagnosis to Surgery > 60 Days			
	N	n	Percent (%)	N	n	Percent (%)	P-Value
Sex - Female	1,234	1,227	99.4%	693	691	99.7%	0.503
Race							
White		1,007	81.6%		547	78.9%	
Black		168	13.6%		115	16.6%	0.205
Other		59	4.8%		31	4.5%	
Ethnicity - Hispanic	1,234	65	5.3%	693	56	8.1%	0.015
Insurance	1,174			693			
None		9	0.8%		10	1.4%	
Medicaid		26	2.2%		66	9.5%	
Medicare		509	43.4%		240	34.6%	0.014
Private		615	52.4%		365	52.7%	
Other		15	1.3%		12	1.7%	
Location of Diagnosis - Home Institution	1,234	730	59.2%	693	433	62.5%	0.152
Clinical Stage	1,234			693			
0		296	24.0%		201	29.0%	
1		873	70.7%		442	63.8%	0.005
2		63	5.1%		45	6.5%	
3		2	0.2%		5	0.7%	
Surgical Option - Lumpectomy	1,234	801	64.9%	693	233	33.6%	<0.001
Upgraded Pathology	1,234	96	7.8%	693	71	10.2%	0.065

1686266 - Impact of the Pandemic on Time to Surgery: A National Database Report

Cary Kaufman[1], Cory Donovan[2], Terry Sarantou[3], Ayfer Polat[4], Marguerite Thomas[5], Bonnie Mack[6], Ramadha Gamage[7], Aerial Gilbert[8], Kimberly Bolin[8]

[1]University of Washington, Bellingham, WA, [2]Legacy Health, Portland, OR, [3]Atrium Health, Charlotte, NC, [4]Ondokuz Mayis University, Samsun, Samsun, Turkey, [5]Penrose-St Francis Cancer Center, Colorado Springs, CO, [6]The Breast Center at Portsmouth Regional Hospital, Portsmouth, NH, [7]Western Washington University, Bellingham, WA, [8]National Consortium of Breast Centers, Warsaw, IN

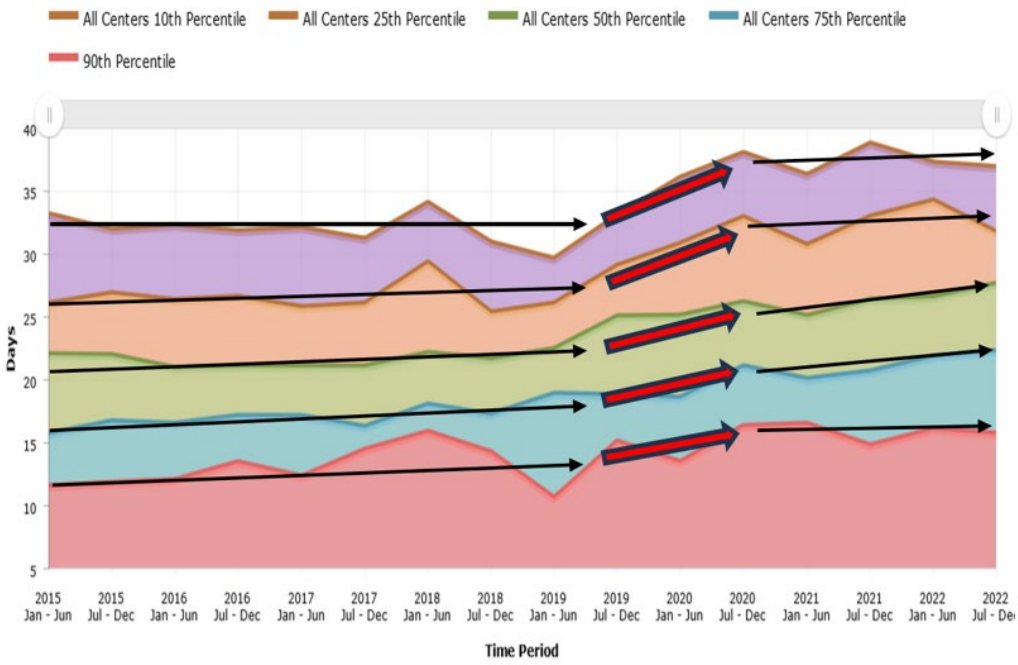
Background/Objective: Timeliness of care is a fundamental quality metric as described by the Institute of Medicine (1999, 2004). The time from breast cancer diagnosis to surgery includes multiple variables across many disciplines and prolonged time to surgery is particularly stressful to the patient. One unexpected variable was the recent pandemic which profoundly impacted patient care. Using an established national database, we compared average time to surgery before, during, and after the pandemic.

Methods: The National Quality Measures for Breast Centers (NQMBC) is a web-based voluntary quality program initiated in 2005 that collects real time data from participating breast centers across the country. Once a center's data is entered, the program provides immediate comparisons with other centers' performance, both overall centers as well as like-center comparisons. One NQMBC measure assesses the average time in business days between core needle biopsy and initial breast cancer surgery, excluding the neoadjuvant patient. Each breast center submission reviews a set of consecutive patients in a six-month period. We compared the average time to surgery (ATTS) for three time periods; 2015 through June 2019 (“before”), July 2019 through December 2020 (“during”), and January 2021 through December 2022 (“after”).

Results: From 2015-2022, 182 NQMBC certified breast centers from 41 States submitted 1,117 data entries that reviewed over 30,869 patients. The average time to surgery (ATTS) over the 8 years was 23.2 days with 25th and 75th percentile at 28.6 and 17.6 days respectively. The ATTS before, during and after the pandemic was 21.9, 25.5 and 26.5 days respectively. Examination of the “before” period revealed a mild but progressive increase in ATTS. The “during” period noted a 16% increase in ATTS. During the two years following the pandemic the ATTS remained 21% above baseline and slowly rose despite much of the country returning to routine care. There was no sign of return to pre-pandemic levels (Figure). Overall, we found increasing ATTS in all breast centers regardless of their initial performance. The greatest increases in ATTS were in the lowest performing centers (10th percentile), with over a week (6 working days) increase in ATTS. Before the pandemic, only 10% of centers had ATTS more than 32 days, after the pandemic 25% of centers performed above that level.

Conclusions: The average time between positive breast biopsy and initial breast cancer surgery was examined in over 30,000 patients before, during and after the pandemic (2015-2022). As expected, the pandemic resulted in a prompt increase in time from biopsy to surgery. After the acute pandemic phase, average time to surgery has not returned to baseline and continues to average 5 working days longer than pre-pandemic levels. These delays occurred among all centers, with low performers showing longer delays. New timeliness quality metrics based on pre-pandemic studies may need to take these findings into account when measuring quality of care. Ongoing monitoring is indicated.

Figure 1: Average time to surgery before, during and post-pandemic 2015-2022 (by performance percentiles 10th, 25th, 50th, 75th, 90th)



1688428 - Celebrex and Doxycycline: An Effective Conservative Treatment Combination for Granulomatous Mastitis in Hispanic Women

Odalys Salinas[1], Juanita Rodriguez[1], Kristina Vatcheva[2], Monica Betancourt-Garcia[1], Lisa Chapa[1]

[1]DHR Health Institute for Research and Development, Edinburg, TX, [2]University of Texas Rio Grande Valley, Brownsville, TX

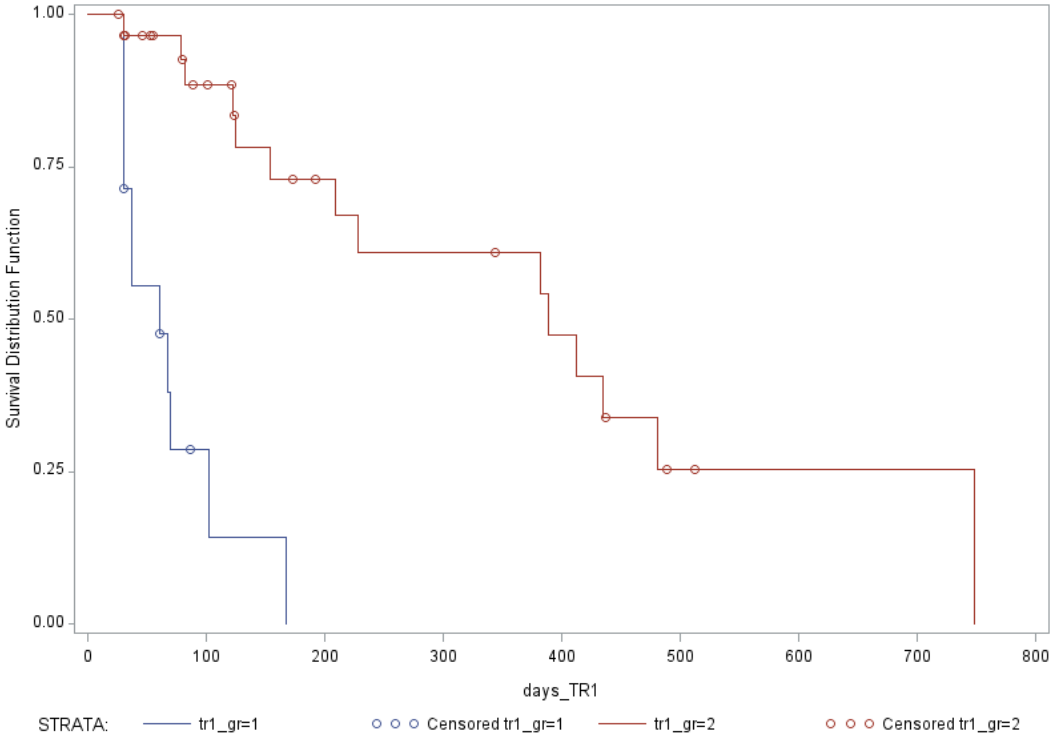
Background/Objective: Granulomatous mastitis (GM) is a rare, benign, and chronic inflammatory condition of the breast that affects mostly Hispanic women. There is not yet a consensus for the optimal treatment of GM and treatment options range from non-operative to operative interventions affecting severely the quality of life of patients. This study aims to describe the efficacy of using a combination of Celebrex and Doxycycline for the treatment and management of GM in Hispanic women.

Methods: A retrospective analysis of patients seen at a single hospital site from January 2020 to May 2023 with the diagnosis of GM were identified using ICD-10 codes. Primary outcome was resolution of symptoms and time to resolution of symptoms in patients receiving combination therapy of Celebrex 100 mg BID and Doxycycline 100 mg BID in comparison with patients receiving any combination of other treatment modalities (steroids, antibiotics, immunomodulators, incision and drainage, lumpectomy, and bilateral mastectomies). Kaplan-Meier and log-rank tests were used to estimate and compare the cumulative proportion of patients' resolution by intervention treatment over time. Cox proportional hazards regression models were used to assess for association between treatment and time to resolution adjusting for other covariates. Negative binomial, zero-inflated, and logistic regressions were used to test for differences in rates of ER visits, hospitalization, surgeries, and recurrence between the two treatment groups.

Results: After exclusions, 45 patients had GM and underwent treatment, mean age and BMI were 40.8 years and 29.37kg/m2, respectively. Of those, 91% of patients identified as Hispanic. A palpable mass was present in 95% of patients. Erythema, fistulization, and abscess were also common complaints in 71%, 51%, and 49% of patients, respectively. Time to resolution was significantly lower in the Celebrex and Doxycycline treatment group ($p< 0.0001$) with a median resolution time of 60 days (95 %, CI 30-102) compared to 389 days (95 % CI 209-481) in other treatment modalities. The median resolution time in patients treated with Celebrex and Doxycycline without fistulization was 37 days (95 % CI 30-67) compared to 134.5 days with fistulization (95 % CI 102, $p=0.0005$). A similar pattern was seen in the other treatment modalities group with no fistulization ($p< 0.0001$) vs fistulization ($p=0.0024$). The rates of surgeries in those treated with Celebrex and Doxycycline were 67% lower RR=0.33 (0.18, 0.63) ($p=0.0007$). No significant difference was found in rates of ER visits RR=0.42 (0.12, 1.59) ($p=0.2076$), rates of hospitalization RR=0.78 (0.09, 6.60) ($p=0.8188$), or odds of recurrence OR=0.48 (0.09, 2.62) ($p=0.3962$) between the two treatment groups. However, the rate of recurrence was 68% higher in those with abscesses, RR=1.68, (1.04, 2.70) ($p=0.0326$).

Conclusions: In Hispanic patients with Granulomatous Mastitis, Celebrex and Doxycycline is an effective therapy that significantly reduces the time to resolution of disease when compared to any other combination of treatment modalities. The results of this study also indicate that patients with fistulization see a significant increase in time to resolution of symptoms in both treatment groups and the presence of a breast abscess is an indicator of a higher rate of future recurrence.

Figure 1. Kaplan-Meier estimated survival curves by treatment groups. Group 1: Treatment intervention Celebrex & Doxycycline. Group 2: Other treatment modalities.



1687171 - Examining Factors That Delay Surgical Care by > 60 Days from the Diagnosis of Breast Cancer in the Post-Pandemic Era

Jason Aubrey[1], Anna Levine[1], Cordelia Tuan[2], Jessica Thompson[2], G. Paul Wright[2]

[1]Corewell Health - Michigan State University, Grand Rapids, MI, [2]Michigan State University College of Human Medicine, Grand Rapids, MI

Background/Objective: In 2022, the Commission on Cancer National Cancer Database (CoC-NCDB) announced a quality metric that the first therapeutic breast surgery in a non-neoadjuvant setting should be performed within 60-days of diagnosis in patients with Stage I-III breast cancer. While factors impacting surgical treatment delays have been previously reported, various time cutoffs have been used. Additionally, the 2019 COVID pandemic has impacted delivery of care models and may have lasting impact on how efficiently patients reach definitive surgery. Our aim is to elucidate factors that result in delays in surgical care outside of this quality measure in a contemporary cohort.

Methods: A single center, retrospective review of a prospective breast cancer registry of patients who underwent surgical treatment of stage I-III breast cancer from July 2020 – June 2023. A univariate analysis of demographic, clinical, and surgical factors is completed between groups based on whether or not surgery was rendered within 60 days of diagnosis. A multivariate model is constructed of factors with a $p < 0.2$ on univariate analysis to implicate independent risk factors for surgical delay.

Results: 1379 patients underwent surgical resection for breast cancer during the study period. 1275 (92.5%) of patients underwent resection within 60 days of diagnosis and 104 (7.5%) of patients > 60 days. Receipt of surgery within 60 days was associated with older age (median 65.7 vs 60.6, $p = 0.004$) and post-menopausal status (93.6% vs 87.4%, $p< 0.001$). There was no difference in BMI, race/ethnicity, or Charlson co-morbidity index between groups. Other univariate associations with delay were performance of genetic testing (9.2% vs 5.6%, $p = 0.012$), preoperative MRI (13.4% vs 4.9%, $p < 0.001$), multi-focal disease (11.3% vs 6.9%, $p = 0.31$), plastic surgery referral (24.8% vs 5.5%, $p < 0.001$), mastectomy (19.3% vs 3.9%, $p< 0.001$) immediate breast reconstruction (30.5% vs 14.0%, $p < 0.001$), any plastic surgery involvement in surgery (27.8% vs 4.8%, $p < 0.001$) were more likely to have a delay in surgical care > 60 days. Patients with their first encounter at a multidisciplinary breast cancer clinic were more likely to receive surgery within 60 days compared with a surgeon-only visit (94.2% vs 88.6%, $p < 0.001$). After controlling for co-linear variables, the multivariate model demonstrated independent risk factors for surgical delay to include: plastic surgery involvement in surgery (OR: 3.7, 95% CI: 2.2 - 6.3), mastectomy (OR: 2.8, 95% CI: 1.7 - 4.7), preoperative MRI (OR: 2.0 95% CI: 1.3 - 3.2), and surgeon-only visit (OR: 1.8, 95% CI: 1.2 - 2.8).

Conclusions: Surgical delays beyond 60 days for breast cancer are multifactorial in the post-pandemic era. Mitigation of delays may be achieved through multidisciplinary engagement and expediting patients who require additional studies or consultation prior to definitive surgical care.

1688110 - Timely Surgery - A Health Equity Metric That Impacts Survival

Tawakalitu Oseni[1], Alexandra Webster[2], Tommy Kim[3], Francys Verdial[1], Michelle Specht[1], Michele Gadd[1], Tolga Ozmen[1], Barbara Smith[1], David Chang[1]

[1]Massachusetts General Hospital, Boston, MA, [2]Yale University School of Public Health, Boston, MA, [3]University of Massachusetts School of Medicine, Worcester, MA

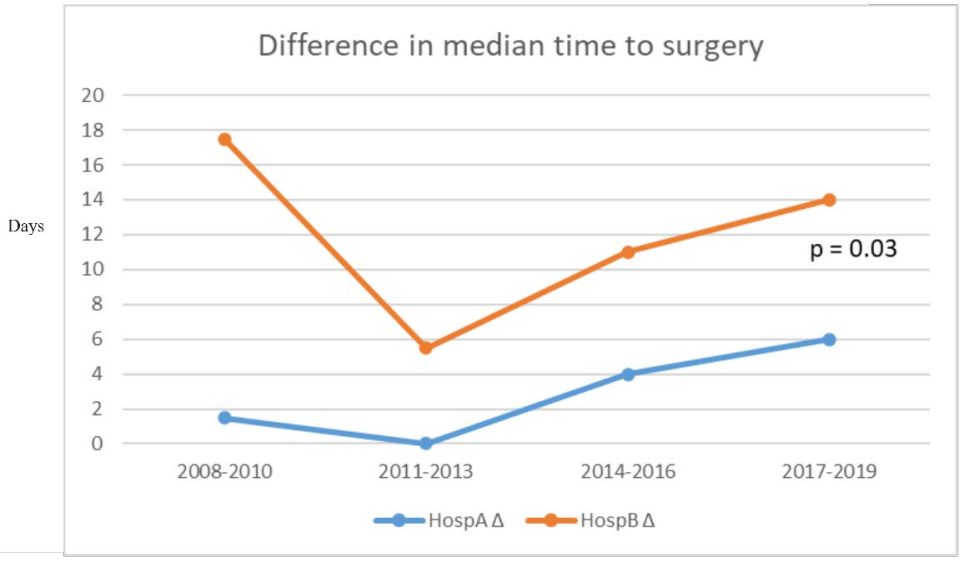
Background/Objective: Delay in surgery can be a surrogate measure of health equity. There is no defined optimal time to treatment interval for new breast cancer diagnoses. As such, the difference in time to surgery between patient populations can be used to assess health equity at the hospital level. We have previously shown that time to surgery varies nationally and is prolonged for Black women. Our goal was to determine intra-health system variation in time to surgery and its impact on overall survival.

Methods: An observational analysis was performed using patient data from an extensive integrated healthcare system that includes multiple outpatient surgery centers and large-sized hospitals. The two largest facilities within the health system with similar patient populations and access standards were selected for comparison. Inclusion criteria were women with stage 0-3 breast cancer, treated between 2008 and 2019. We excluded women who underwent neoadjuvant chemotherapy. The primary outcome variable was surgery within 90 days of initial presentation to the health system. Adjusted analysis was performed, controlling for age, comorbidity, insurance, and calendar year.

Results: 17,105 patients were analyzed, with 87.7% White women, 3.3% Black women, 1.4% Hispanic women, 3.7% Asian women, and 3.9% other. Compared to White women, Black women had a longer time to surgery regardless of procedure and location within the health system (28.5-42 days) vs. (26-33 days). However, there was significant health system variation in the difference in time to surgery (ΔTTS) between Black and White women Fig 1. The trend in ΔTTS was consistent across all sites and decreased from 2008-2013 but increased from 2013 to 2019. However, this gap varied across the two high-volume sites within the integrated health system Fig 1. At the last follow-up, women who received surgery within 90 days, regardless of which site within the health system, had an improved overall survival of 91% vs. 85.8% $p< 0.001$ (Hosp A), 92.3% vs. 85.5% $p< 0.001$ (Hosp B). Factors associated with >90 days to surgery included payor status, race, and age.

Conclusions: There are significant intra-health system variations in time to surgery, and the time to surgery has increased for all populations in the last five years. Sizeable integrated health systems are becoming more common in the healthcare industry; this study is novel in finding that this may increase the time to surgery. Differences in time to surgery between patient populations can be used as a health equity metric and a target for health system intervention.

Figure 1: Difference in time to surgery between Black and White women across health system



1689068 - Comparison of Oncology Navigation in Patients with Breast Cancer Admitted to a Brazilian Public Oncology Service Before and During the COVID-19 Pandemic

Diego Nascimento, Bruna Mota, José Roberto Filassi, Jonathan Yugo Maesaka, Gabriela Boufelli de Freitas, Angela Francisca Trinconi, Marina Bellatti Küller, Rodrigo Gonçalves, Edmund Chada Baracat

University of Sao Paulo, São Paulo, Brazil

Background/Objective: In March 2020, the World Health Organization (WHO) classified the COVID-19 infection as a pandemic, bringing with it repercussions related to the allocation of financial resources and the reduction of spread in different health systems around the world. It is known that establishing strategies for navigating cancer patients brings numerous benefits, from reducing advanced-stage diagnoses to improving survival and reducing healthcare costs.

Methods: We designed a retrospective cohort study comparing the access to and actual breast cancer treatment patients before and during the COVID-19 pandemic at Public Oncology Treatment Center, linked to the University of São Paulo(USP). The investigational arm included all consecutive patients treated from March/2020 to March/2021, and the control arm included all consecutive patients treated from march/2018 to march/2019 were eligible. The study was approved by the Ethics and Research Brazilian Committee (number 52378521.8.0000.0068). We compared clinical characteristics of patients during the first year of the pandemic and the pre-pandemic year with breast using t tests for continuous variables and $\chi 2$ tests for categorical variables. The data were extracted and maintained on the RESEARCH ELECTRONIC DATA CAPTURE (REDCAP®) platform. Statistical analysis was performed using the IBM SPSS Statistics, with a p-value of less than 0.05 considered statistically significant.

Results: Regarding the proposed initial treatment: In the period from 2018 to 2019, upfront surgery was indicated for 390 patients (49.6%) versus 218 patients (38.4%) in the period from 2020 to 2021. In comparison to the same period, neoadjuvance was indicated for 295 patients (37.5%) in the period before the pandemic and 276 (48.6%) during the pandemic. [OR 1.674, 95%CI 1.326 – 2.113] p 0.000. Of the total number of eligible patients (n= 786), 101 patients (12.8%) were indicated for palliative treatment between 2018 and 2019 and 74 (13.0%) between 2020 and 2021 [OR 1.311, 95%CI 0.930 – 1.846] p 0.122. Regarding the time between the diagnosis, carried out in an external service, and the first consultation in the reference service, there was an average of 45.27 days between 2018 and 2019 and 39.319 during the pandemic period with p=0.000. The access of patients to the first treatment (local or systemic) who entered the service, biopsies and mammography, occurred on average of 99.62 days in the period from 2018 to 2019 and 111.81 days in the period from 2020 to 2021, with p = 0.126. Access between the first consultation and the first treatment occurred with an average time of 56.19 days in the pre-pandemic period and 71.73 days during the pandemic with p=0.003.

Conclusions: In the face of the COVID-19 pandemic, patients' access to breast cancer treatment, as well as their initial navigation, did not show statistically significant differences. Neoadjuvant indications increased and access to the first treatment also did not present statistically significant differences. It is still necessary to follow up these patients to analyze overall survival and local or distant recurrence. In a preliminary analysis, navigation in oncology, already structured in advance, prevented oncological treatment from being postponed.

1683300 - Following Circulating Tumor DNA in Breast Cancer Patients to Enhance Treatment Options

Linda Smith, Samantha Ditto

XRANM, Albuquerque, NM

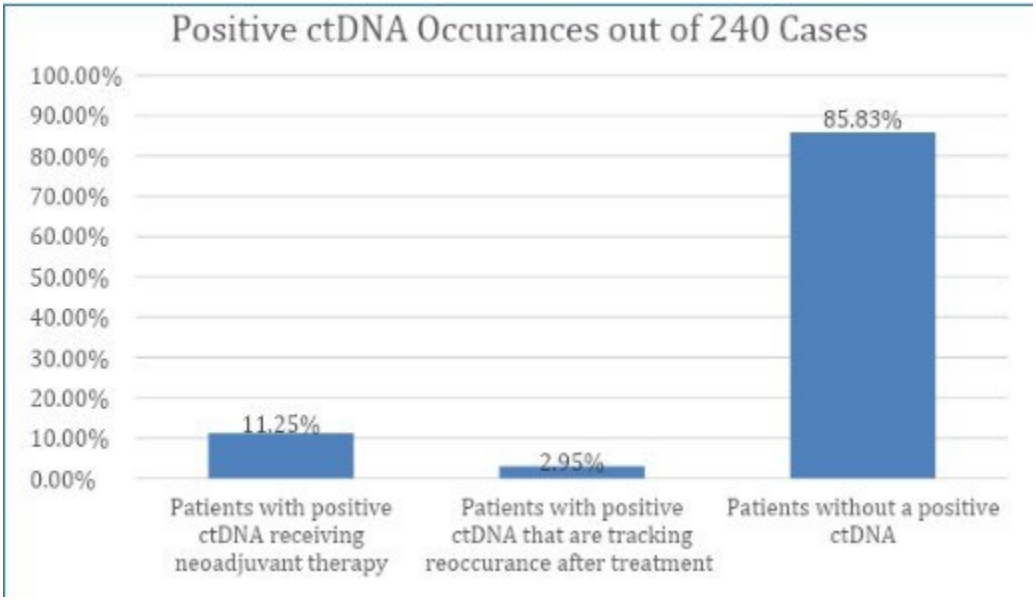
Background/Objective: Circulating tumor DNA, or ctDNA, consists of biomarkers of tumor DNA that are found circulating through the blood stream. Currently, ctDNA can be used for patients tracking for residual disease after treatment, or for those currently undergoing treatment. The current gold standard for identifying and profiling tumors for diagnoses remains tissue biopsy, although considering that breast cancer is a heterogenous and dynamic disease, which can cause molecular changes over time, the ability to monitor these changes during treatment could improve treatment precision and prevent against recurrence and resistance (1). There is promising data that suggests that patients who undergo neoadjuvant therapy will see a decline in their ctDNA. Therefore, the ability to detect ctDNA may prove to be an effective way to predict the efficiency of neoadjuvant therapy (3). There are also benefits to tracking ctDNA after treatment and surgery, as it has proven to be an indicator for those susceptible to early relapse. Even with significant improvement to detection technology over the last few decades, upwards of 30% of women with no indication of disease following treatment will eventually relapse and succumb to their disease. (4)

Methods: The data utilized in this study was collected by in a breast surgery center utilizing the company Natera, a leader in genetic testing and ctDNA observation, and analyzed using their Signatera Residual Disease Test for the detection of ctDNA. This study analyzed the ctDNA results of 240 breast cancer patients in different phases of treatment.

Results: 240 breast cancer patients were tested for ctDNA in their bloodstream through blood draw using Natera's Signatera Residual Disease Test. Each patient in this study was either testing for ctDNA to track for residual disease or were actively going through treatment and tracking for effectiveness, being drawn and tested every 3 months or 6 weeks, respectively. Of the 240 patients tested for ctDNA, there were 34 positive cases (14.17%) and 206 negative cases (85.83%). Within the 34 positive cases for ctDNA, 27 (11.25%) of those cases were patients that were receiving neoadjuvant therapy, and 7 (2.95%) of those cases were patients that were tracking for residual disease following treatment. Out of the 27 patients that had undergone neoadjuvant therapy, 18 (66.67%) of those cases were patients that had returned negative or were trending toward negative nearing 0 MTM/mL of ctDNA, and 9 (33.33%) of those cases were patients that remained positive after treatment. Limitations were prevalent, as some patients were still in preliminary phases of treatment during the study and had only received their first ctDNA blood draw. These cases only showed as a singular positive ctDNA result and were yet to trend toward positive or negative during their treatment at the time of this study.

Conclusions: The results of this study show that breast cancer patients that are positive for ctDNA and undergo neoadjuvant treatment are more likely to decrease their ctDNA. The utilization of ctDNA in the breast cancer treatment process offers the opportunity for ease of access, specificity, and longevity for patients following treatment.

Figure 1: Positive ctDNA occurances out of 240 cases



1679671 - Financial De-escalation in T1 Breast Cancers with the Magee Equation: An Experience From a Single Institution Without Genomic Testing

Caroline Lippe[1], Manpreet Sandhu[2], Katherine Barton[3], Kit Lu[3], Atilla Soran[4], Yijin Wert[3]

[1]UPMC Central PA, Enola, PA, [2]Penn State Health Cancer Institute, Harrisburg, PA, [3]UPMC Central PA, Harrisburg, PA, [4]UPMC Magee Women's Hospital, Pittsburg, PA

Background/Objective: The Oncotype Dx® assay (Recurrence score, RS) has been a validated tool to determine the prognosis and predication of benefit of adjuvant systemic chemotherapy for patients with node negative, early stage hormone receptor (HR) positive HER-2 negative breast cancers. However, genomic testing could incur additional cost impacting both the patient and to the overall health system. This study aims to identify a subset of patients with T1, Grade 1 de-novo breast cancer with Magee score ≤ 18 who may be safely forgo Oncotype Dx® testing.

Methods: This was a single institution retrospective analysis of postmenopausal patients with de-novo, unifocal breast carcinoma that is node negative, Nottingham Grade 1, T1 (Tumor ≤20 mm in greatest dimension) and HR positive (>1%) and HER-2 negative. Magee equation 2 (https://path.upmc.edu/onlineTools/mageeequations.html) was calculated for each patient. A correlation coefficient between the Oncotype Dx® and Magee equation 2 was determined.

Results: 126 post-menopausal women diagnosed between 2015 and 2020 who met the selection criteria were analyzed. The median age was 64 years old (range 51 to 85 years old). Recurrence score, treatment, and outcomes are summarized in Table 2. The average tumor size was 1.09 cm (0.2 to 2 cm). Average Oncotype DX® score was 12 (range 0 to 25). Average Magee 2 equation score was 13.6 (range 5.04 to 24.0). A correlation coefficient between Oncotype and Magee 2 score was statistically significant (0.3479; p value< 0.0001). At a median follow up of 5.03 years there were no local or distant recurrence or breast cancer related death reported in this patient cohort.

Conclusions: This study demonstrated the feasibility of omitting Oncotype Dx® assay in postmenopausal women with node negative, T1, Nottingham Grade 1, HR positive, HER2 negative breast carcinoma with Magee 2 equation score ≤ 18. Using comparable tools such as Magee 2 equation may reduce financial toxicity to this population and overall cost to the system. Larger study recommended.

Table 1. Patients' clinic-pathologic characteristics, treatment, and recurrence scores

	Tumor <5mm, T1a (n=4)	Tumor 5-9mm, T1b (n=64)	Tumor 10-20mm, T1c (n=58)	Recurrence Score ≤18	Magee 2 Score ≤18
Age (years)	64.3	64.5	64.2		
(average, range)	(58-69)	(53-78)	(51-85)		
Tumor Size Average (mm)	5	7.9	14.5		
(+/- STD)	0	0.16	0.31		
(Range)	(5 to 5)	(5 to 11)	(10 to 20)		
Estrogen Receptor Status					
Positive	4	64	58		
ER H Score Average	293	281	278		
Progesterone Receptor Status					
Positive	4	61	56		
Negative (<1%)	0	3	2		
PR H Score Average	105	196	278		
Histologic Features					
Presence of LVI	0	1	0		
Presence of PNI	0	0	5		
Surgery					
Partial Mastectomy	4	53	52	92	99
Mastectomy	0	11	6	17	15
Sentinel Lymph Node Biopsy					
Yes	4	59	57	100	108
Omitted	0	5	1	6	6
Radiation					
Whole breast	4	39	44	74	78
Partial breast	0	3	1	4	3
Omitted	0	22	13	28	33
Endocrine therapy					
Yes	3	48	54	93	99
Omitted	1	16	4	13	15

1688185 - Reclassification and Discordance in Breast Cancer Molecular Subtyping in a Black Patient Population: The Benefit of Genomic Testing at the Time of Core Needle Biopsy

Cristina Solis-Pomales[1], Amy Jeng[1], Kseniya Roudakova[2], Jose Jaime Alberty-Oller[2]

[1]SUNY Downstate Health Sciences University, Brooklyn, NY, [2]NYC Health + Hospitals|Kings County, Brooklyn, NY

Background/Objective: Breast cancer (BC) has been historically classified into four molecular subtypes based on hormone and HER2/neu receptor status via immunohistochemistry (IHC) and fluorescence in situ hybridization (FISH). Genomic profiling in addition to biomarkers can more accurately characterize the underlying biologic subtype and signaling pathways of a tumor. BluePrint(BP) is an 80-gene molecular subtyping assay that characterizes tumors into Luminal type, HER2 type or Basal type. The Neoadjuvant Breast Registry Symphony Trial showed that up to 22% of tumors were reclassified into a different molecular subtype with BP and that reclassification based on BP could more accurately predict treatment response. Some studies have shown that Black patients have higher rates of reclassification after tumor genomic profiling compared to White patients, which can potentially impact treatment and outcomes. Here, we review the rates of reclassification at a single center with a predominantly Black patient population.

Methods: After IRB approval, we retrospectively identified all Black patients diagnosed with invasive BC at a public New York City hospital between 2021 and 2023 who had BP sent on core needle biopsy (CNB). The rates of reclassification and its implications were examined.

Results: Out of the total 85 Black patients, there were some discordant results between their BP results and pathologic IHC subtyping (Table 1). 13 patients were triple negative on IHC. Of these, 12 were appropriately classified as Basal on BP, while 1(7.8%) was reclassified as Luminal B. Out of the 4 patients with HR-/HER2+ receptors on IHC, 1(25%) patient was reclassified as Basal. 66(77.6%) patients were ER receptor positive, and of these, 3 were also reclassified as Basal type on BP. Based on this discordance, all 3 patients were offered neoadjuvant chemotherapy (NAC): while 1 declined treatment, both patients that received NAC downstaged their tumors and 1 even achieved pathological complete response (pCR). 45/85(52.9%) patients were considered clinically high risk, defined as T2+, cN1+ and/or pre-menopausal, while 40/85(47.1%) were clinically low risk (< T2, cN0, post-menopausal). 12/45 (26.7%) clinically high risk were reclassified as Luminal A on BP. Moreover, 3/40(7.5%) clinically low risk were reclassified as Basal. While clinically high-risk patients were more likely to receive NAC ($p< 0.001$), 2 out of 3 clinically low risk patients who were reclassified as Basal received NAC and both patients achieved pCR.

Conclusions: High rates of discordances between BP and clinical factors/IHC were identified in this Black patient population. Reclassification sometimes affected treatment decisions, leading to favorable results such as pCR after NAC. Our findings suggest that genomic profiling at time of CNB could be beneficial for Black patients, as treatment decisions based on reclassifications could potentially improve outcomes.

Table 1: Distribution of clinical factors/IHC and treatment vs Blueprint Subtype

			BluePrint Subtype			
	Luminal A	Luminal B	HER2	Basal	Total	p value
N	35 (41.2%)	26 (30.6%)	7 (8.2%)	17 (20.0%)	85 (100.0%)	
IHC						
HR+HER2-	33	20	0	2	55 (64.7%)	<0.001*
HR+HER2+	2	5	4	2	13 (15.3%)	
HR-HER2+	0	0	3	1	4 (4.7%)	
HR-HER2-	0	1	0	12	13 (15.3%)	
Clinical Risk						
Low risk (L)	23	12	2	3	40 (47.1%)	0.008*
High risk (H)	12	14	5	14	45 (52.9%)	
NAC						
No	33	17	3	4	57 (67.1%)	<0.001*
Yes	2	9	4	13	28 (32.9%)	
Key: L= (<T2, cN0, postmenopusal), H=(T2+, cN1+, premenopausal), NAC= neoadjuvant						
chemotherapy, *=implies statistical significance						

1609718 - Relationship of Breast Cancer Pathologic Tumor Grade and Oncotype DX Recurrence Scores: A Scoping Review

Cassie Connerty

Baylor Scott & White, Georgetown, TX

Background/Objective: Oncotype DX is a genomic test used to predict breast cancer recurrence and determine the benefit of chemotherapy. While this test is an excellent predictor of chemotherapy value, it is expensive and adds to the health systems' already significant financial burden. Various studies have demonstrated a predictive value between standard clinicopathologic features of breast cancer and Oncotype DX recurrence scores, which is more cost-effective. The primary aim of this scoping review is to investigate if pathologic tumor Grade can predict Oncotype DX recurrence scores in breast cancer patients. Can pathologic tumor Grade predict Oncotype DX recurrence scores? Is it possible to omit Oncotype DX testing in some patients with early Grade 1 breast cancers?

Methods: Four electronic databases (PubMed, CINAHL, Scopus, and Google Scholar) were systematically searched for relevant published studies on breast cancer tumor Grade's predictive value of Oncotype DX on recurrence scores. One reviewer screened all identified articles based upon predetermined inclusion and exclusion criteria.

Results: Fourteen articles met the inclusion criteria evaluating the relationship between Oncotype DX recurrence scores and Grade 1 tumors. All fourteen articles showed significant predictive value between low Oncotype DX recurrence scores and Grade 1 tumors. Eleven studies presented Grade 1 tumors as statistically significant independent predictors of low Oncotype DX recurrence scores. At the same time, two articles found a meaningful link between low Oncotype DX recurrence scores and Grade 1 tumors coupled with progesterone receptor positivity. One study identified predictive value between Grade 1 tumors with a low Oncotype DX recurrence score and mitotic count of 1.

Conclusions: Oncotype DX is an excellent predictor of chemotherapy need. Conversely, the test contributes significantly to healthcare costs and expenditures. This scoping review summarizes robust evidence that Grade 1 tumors are an independent predictor of low Oncotype DX recurrence scores, thus calling into question Oncotype DX recurrence score testing in early staged breast cancer patients with Grade 1 tumors.

Table 1: Descriptive summary of study characteristics

Study	Country	Sample Size	Duration	RS Cutoff Used	Node Status Included	Results
Wilson et al.	United States	371	2012-2016	TAILORx	N1	Histology and Grade 1 only significant predictors of low RS, p=0.012
Kapadia et al.	United States	215	2008-2018	TAILORx	N1	Low pretest probability (grade) were significantly likely to have low RS, p=0.002
Singh et al.	United States	863	2001-2016	NSABP B20 and TAILORx	not mentioned	No grade 1 tumors in the high RS group, p<0.001
Ali et al.	United States	251	2019-2021	TAILORx	Node negative	No patients with a grade 1 tumor showed benefit for chemotherapy
Huang et al.	United States	42,530	2010-2013	NSABP B20 and TAILORx	N1	Grade 1 is a statistically significant predictor of low RS
Salih et al.	Qatar	54	2012-2017	NSAPB B20	not mentioned	Oncotype RS correlates with tumor grade, p<0.003
Thibodeau et al.	Canada	201	2012-2017	NSABP B20 and TAILORx	Node negative or micromet	Tumor grade predictor of RS, p<0.0001
Durrani et al.	Saudi Arabia	156	2014-2018	TAILORx	N1	Significant correlation of grade1 node negative patients and low RS, p<0.001
Davey et al.	Ireland	400	2007-2015	TAILORx	Node negative	Grade 1 tumor independently predicts low RS, p=0.016
Alkushi et al.	Saudi Arabia	114	2012-2019	NSAPB B20	N1	Tumor grade and PR receptor only predictor of RS, p<0.001

1685334 - The Clinical Relevance of Neuronal Activity Measured by ARC Gene Expression in Breast Cancer Biology

Gabrielle Yee, Kazuaki Takabe

Roswell Park Comprehensive Cancer Center, Buffalo, NY

Background/Objective: Recently peritumoral lidocaine infiltration prior to removal was reported to be associated with better survival in early-stage breast cancer (BC). This led us to hypothesize that innervation to the tumor affects its biology and patient survival. Activity-regulated cytoskeleton-associated protein (ARC) gene expression is known to be regulated by neuronal activity. Therefore, we studied the clinical relevance of ARC gene expression as a surrogate of neuronal activity in breast cancer.

Methods: Sweden Cancerome Analysis Network—Breast (SCAN-B (GSE96058), n=3273) cohort was analyzed, and the results were validated using The Cancer Genome Atlas (TCGA, n=1069).

Results: ER-positive/HER2-negative and Luminal A type cancers expressed significantly higher ARC compared to the other subtypes in both cohorts ($p< 0.005$). In the tumor microenvironment, the stromal cells such as fibroblasts, endothelial cells and adipocytes were all found to be significantly infiltrated in high ARC BC ($p< 0.01$). Multiple immune cells were significantly infiltrated in high ARC BC, including CD8, CD4 memory cells, helper type II T cells, regulatory T cells, M1 and M2 macrophages, dendritic cells and B cells (all $p< 0.03$ in both cohorts). In terms of cancer characteristics, there was no difference in silent or nonsilent mutations, single nucleotide variant or indel neoantigens between tumors with low or high ARC expression. However, high ARC BC was significantly associated with less homologous recombination deficiency, intratumor heterogeneity and fraction altered mutation rate compared to low ARC BC in TCGA ($p< 0.001$). High ARC expression was significantly associated with smaller tumor size ($p< 0.001$) and without lymph node metastasis in the SCAN-B cohort ($p< 0.02$), and less Stage IV disease in the TCGA cohort ($p< 0.02$); however, these results were not validated by the other. High ARC BC was significantly associated with lower Nottingham histologic grade and lower MKi67 expression in both SCAN-B and TCGA cohorts ($p< 0.001$). Cell proliferation-related gene sets in the Hallmark collection (E2F targets, G2M checkpoint, and MTORC1 signaling) were significantly less enriched to high ARC BC consistently in both cohorts. Overall survival (OS) was significantly better in high ARC BC in the ER-positive/HER2-negative subtype consistently in both cohorts ($p< 0.01$), and when including all subtypes in the SCAN-B cohort ($p< 0.001$); however, this was not validated in TCGA. No significant difference in OS was found between low and high ARC gene expression in triple negative breast cancers in either cohort.

Conclusions: ARC gene expression as a surrogate of neuronal activity in breast cancer was associated with high infiltration of stromal cells and immune cells, but with less cancer cell proliferation and better overall survival, particularly in the ER-positive/HER2-negative subtype. Future studies are warranted to investigate the exact molecular mechanism underlying the effects of ARC.