Presentation Awards and Eligibility

Abstracts submitted are eligible for awards. The George Peters Award recognizes the best presentation by a breast fellow and is awarded $1,000. The Scientific Presentation Award recognizes an outstanding presentation by a resident or fellow and is awarded $500. All presenters are eligible for the Scientific Impact Award. The recipient of the award is selected by the audience. The awards are supported by The American Society of Breast Surgeons Foundation.

The George Peters 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.
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Scientific Session Oral Presentations
1759
Perceptions of Contralateral Breast Cancer: An Overestimation of Risk
Am Abbott, NM Rueth, KM Kuzni, TM Tuttle
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Objective: Among patients with unilateral breast cancer, without BRCA1 mutation, the cumulative 10-year risk of contralateral breast cancer is less than 10%. Despite this relatively small risk, several studies have demonstrated that the rate of contralateral breast cancer (CPC) has markedly increased in recent years. The aim of this study was to understand women’s perceptions of their breast cancer risk at the time they were offered surgical evaluation and to evaluate tumor and patient factors to determine predictors of risk perception.

Methods: We designed a survey to evaluate perceptions of breast cancer risk and psychosocial well-being in women newly diagnosed with breast cancer. Surveys were distributed to women with unilateral breast cancer in situ (DCIS) or invasive breast cancer prior to surgical consultation. Women were excluded from the study if they had a history of cancer, metastatic disease, breast cancer, diabetes, unrelated contralateral cancer, or were undergoing chemotherapy or radiation for breast cancer. Survey items were constructed using open-ended response and 5-point Likert scales (5 = very likely, 1 = at all likely).

Results: The survey was completed by 45 women with an average age of 53.0 years. Diagnoses included ductal cancer (69.3%), lobular cancer (11.1%), and DCIS (17.8%). Most patients had estrogen receptor positive (85.6%) tumors with a median size of 1.7 cm, and 44.2% of patients had a family history of breast cancer. The majority of patients (56.7%) had breast-conserving surgery (BCS); 17.8% had lumpectomy (LUM), other, lumpectomy with ultrasound control (LUM/U), mastectomy, or were undergoing cervix biopsy. The mean perceived risk of recurrence was 40.4% (95% CI, 32.2% to 48.6%), and the mean perceived risk for developing metastatic disease was 27.5% (95% CI, 34.7% to 20.7%) and 2.6% to 0.1% on the rank scale. The perceived risk of contralateral breast cancer was not significantly associated with stage (DCIS vs invasive breast cancer), family history, age, or receipt of MRI. The mean perceived risk of recurrence for Group 1 was 40.4% (95% CI, 32.2% to 48.6%) and 2.2% to 0.1% on the rank scale. The mean perceived risk for developing metastatic disease was 27.5% (95% CI, 34.7% to 20.7%) and 2.5% to 0.1% on the rank scale. The perceived risk of contralateral breast cancer was significantly different between women who ultimately underwent CPM versus BCS or UM (13.1 vs 2.3, p = 0.18). Likewise, we found no significant differences in anxiety, difficulty sleeping, or unhelpfulness between patients who underwent CPM versus those who did not.

Conclusions: At the time of surgical evaluation, women with unilateral breast cancer grossly overestimate their risk of contralateral breast cancer. Nevertheless, CPM rates were not significantly associated with perceived risk of contralateral breast cancer. This finding highlights the importance of early surgical involvement in the decision-making process for cancer treatment and the need to provide patients with accurate information regarding their true contralateral breast cancer risk.

1670
The Potential Impact of USFSP Recommendations on the Early Diagnosis of Breast Cancer
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1Loma Linda University, Department of Medicine, Loma Linda, CA, 2Loma Linda University School of Public Health, Loma Linda, CA, 3Brody School of Medicine, East Carolina University, Greenville, NC
Objective: Diagnosis of early-stage breast cancer relies on mammographic screening for detection. Current USPSTF guidelines recommend against routine mammography in women 40-49 years of age. However, breast cancer occurs at a relatively younger age in non-Hispanic whites, women and is survivable in non-Hispanic black women and women in low socioeconomic status (SES). We hypothesized that screening at a younger age may be important for detecting early and more treatable cancers in women for these demographic groups. We sought to determine the potential impact of the USPSTF recommendations on women age 40-49 diagnosed with breast cancer in California. Methods: We analyzed patients 40-49 years who were diagnosed with DCIS or T1N0 breast cancer between 2004 and 2008 with records in the California Cancer Registry. EHR variables were divided into two age groups: (1) women age 40-49 years, who are excluded from USPSTF recommendations for screening, and (2) women 50-74 years, who are recommended for screening. Proportions of patients in the two age groups were compared by race/ethnicity, socioeconomic status (SES), and hormone receptor (HR) status, using Pearson chi-squared and logistic regression analyses.

Results: Of 46,619 patients identified as 42,216 women age 40-49 years and 77.4% were age 50-74 years. Overall, 34.4% of the population had DCIS; 72.1% had hormone receptor positive disease; 9.6% had HER-2 positive (86.0%) tumors with a median size of 1.7 cm, and 44.2% of patients had a family history of breast cancer. The majority of patients (56.7%) had breast-conserving surgery (BCS); 17.8% had lumpectomy (LUM), other, lumpectomy with ultrasound control (LUM/U), mastectomy, or were undergoing cervix biopsy. The mean perceived risk of recurrence was 40.4% (95% CI, 32.2% to 48.6%), and the mean perceived risk for developing metastatic disease was 27.5% (95% CI, 34.7% to 20.7%) and 2.2% to 0.1% on the rank scale. The mean perceived risk for developing metastatic disease was 27.5% (95% CI, 34.7% to 20.7%) and 2.5% to 0.1% on the rank scale. The perceived risk of contralateral breast cancer was significantly different between women who ultimately underwent CPM versus BCS or UM (13.1 vs 2.3, p = 0.18). Likewise, we found no significant differences in anxiety, difficulty sleeping, or unhelpfulness between patients who underwent CPM versus those who did not.

Conclusions: The rate of distant metastases was not significantly different between women who ultimately underwent CPM versus BCS or UM (13.1 vs 2.3, p = 0.18). Similar numbers to that of the initial survey reported neutral findings or dissatisfaction with their CPM decision on follow-up survey (8% and 6%, respectively, initial survey; 4% and 6% follow-up survey). There was no significant change in the proportion indicating they would choose CPM again, but as with satisfaction, the proportion was slightly higher on the follow-up survey (95%, initial survey; 97%, follow-up survey, p = 0.27). The most frequently cited adverse effects were similar at both time points and included body appearance (29% vs 31%, initial vs follow-up survey, p = 0.61), sense of femininity (21% vs 24%, p = 0.25), and sexual relationships (24% vs 23%, p = 0.68).

Conclusions: There is remarkable stability of satisfaction with decision to undergo CPM over 20 years after surgery. Adverse psychosocial effects do not increase over time.

1674
Lumpectomy Cavity Shaved Margins Do Not Impact Re-Excision Rates
Suzanne Brooks Cossey, Juliette Buckley, Barbara Lynn Smith, Kevin Hughes, Michelle Gadd, Michele S. Gadd
Massachusetts General Hospital, Boston, MA
Objective: The benefits of taking shaved cavity margins (SCMs) at the time of lumpectomy are unclear. Reports of decreased re-excision rates with additional shaved margins range from 14-66%. However, statistical conclusions from these studies is challenging due to the lack of direct comparison to lumpectomy groups alone, the exclusion of patients with DCIS, and the limited amount of information regarding overall volume of tissue excised. We sought to determine if taking SCMs at the time of lumpectomy decreases re-excision rates when compared to lumpectomy only.

Methods: Five hundred and four patients who underwent lumpectomy for invasive cancer or ductal carcinoma in situ at a single institution from 2004-2006 were identified. Patients who underwent an excisional biopsy for diagnosis were excluded. Patients were divided into three groups: Group 1 had a lumpectomy alone (n = 94), Group 2 had a lumpectomy plus selective (1-3) SCMs (n = 85), and Group 3 had a lumpectomy plus complete (4) SCMs (n = 325). Pathologic findings and surgical outcomes were compared between the groups.

Results: Of the 504 patients who underwent lumpectomy with or without SCMs, the mean age was 55 years and the mean tumor size was 1.6 cm. Two hundred and ninety-nine tumors contained IDC, 154 were DCIS alone, 40 were ILC, and 11 were other types. Forty-four percent (156/350) of invasive cancers were positive for ER. There was a statistically significant larger mean total volume of breast tissue excised in Group 1 compared to Groups 2 and 3 (p < 0.01). There was no significant difference in close or positive margin rates (p = 0.29, p = 0.54) or reoperation rates (p = 0.73, p = 0.99) comparing lumpectomy alone to lumpectomy plus shave excision and complete SCMs, respectively. Similarly, there was no significant difference in successful breast conservation rates between Group 1 and Group 2 or 3 (p = 0.05, p = 0.93).

Conclusions: Taking additional shaved cavity margins at the time of lumpectomy did not decrease the frequency of close or positive margins or the rates of re-excision in our cohort of patients. Despite the finding that significantly less overall breast tissue was excised when shaved cavity margins were taken, there was no associated increase in locoregional recurrence rates.

Table 1. Odds ratios for breast cancer in women age 40-49 years (versus 50-74 years)

<table>
<thead>
<tr>
<th>Group</th>
<th>[No Shaves]</th>
<th>[1-3 Shaves]</th>
<th>[4+ Shaves]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs 2</td>
<td>0.96</td>
<td>1.01</td>
<td>1.00</td>
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<tr>
<td>p value</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
</tr>
</tbody>
</table>

Table: Comparison of study groups

<table>
<thead>
<tr>
<th>Group</th>
<th>[No Shaves]</th>
<th>[1-3 Shaves]</th>
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<tr>
<td>p value</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
</tr>
</tbody>
</table>

Mean Total Volume (cm³) 108.0 117.9 157.2 p < 0.01

Close or Positive Margins 47.8% 40.0% 44.3% p = 0.29

Reoperation 42.5% 40.0% 42.5% p = 0.73

Successful BCT 46.9% 46.9% 46.9% p = 0.97

Radiation 98.4% 98.4% 98.4% p = 1.0

LRR 1.3% 2.6% 1.7% p = 0.56

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Lymph Node Ratio Should Be Incorporated Into Staging for Breast Cancer

Anees B Chagpar, Robert L Camp, David L Rimm
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Objective: It is well established that lymph node status is one of the most significant prognostic indicators in women with breast cancer; however, the optimal way to classify lymph node status remains unclear. Recently, it has been suggested that lymph node ratio (LNR; defined as number of positive nodes/number of nodes dissected) may provide more prognostic information than number of positive nodes alone. We sought to evaluate this hypothesis in a cohort of node-positive breast cancer patients.

Methods: Data from a cohort of 319 node-positive breast cancer patients diagnosed between 1956 and 1982 were analyzed for overall survival based on current AJCC nodal staging versus LNR. Kaplan-Meier survival analysis using log-rank tests were used for univariate analysis and Cox proportional hazards modeling was used for multivariate survival analysis.

Results: The median patient age at diagnosis was 58 (range, 29-88), and the median tumor size was 2.75 cm (range, 0.13-14.50). The median number of positive nodes removed was 4 (range, 1-41); the median number of total nodes dissected was 13 (range, 1-48). The median LNR was 0.40 (range, 0.3-1.00). In terms of AJCC categorization, 157 (49.2%) patients were pN1 (1-3 positive nodes), 97 (30.4%) were pN2 (4-9 positive nodes), and 65 (20.4%) were pN2≥10 positive nodes. Classifying LNR into low (<0.2), intermediate (0.2-0.65), and high (>0.65) risk categories, 90 (28.3%) were low risk, 119 (38.3%) were intermediate risk, and 110 (34.5%) were high risk. The median follow-up of the cohort was 68.7 months (range, 2.3-498.0). AJCC nodal status correlated with overall survival, with median survival rates of 85.9, 70.4, and 48.4 months for pN1, pN2, and pN2≥10, respectively, p < 0.018. LNR also correlated with overall survival, with median overall survival rates of 105.8, 72.2, and 48.4 months for the low-, intermediate-, and high-risk groups, respectively, p < 0.005. On multivariate analysis, LNR predicted overall survival independent of pN status (p < 0.001). Stratifying by pN status, LNR could discriminate distinct subpopulations of patients with significantly different overall survival rates (see Table 1, Figures 1-3). On multivariate analysis, controlling for tumor size, LNR remained a significant predictor of overall survival (p < 0.001). In a multivariate model controlling for tumor size, histologic tumor grade; nuclear grade; and ER, PR, and her-2-neu status, LNR remained the only significant predictor of overall survival (p < 0.001).

Conclusions: LNR has the ability to discriminate populations with significantly different overall survival rates within traditional AJCC node classification groups and offers independent prognostic value over number of lymph nodes involved alone. Further, LNR predicts overall survival independent of traditional clinicopathologic factors. Consideration should be given to incorporating LNR into the breast cancer staging system.

Variability in the Quality of Pathology Reporting of Margin Status Following Breast Conservative Surgery

Ted James, Berta Geller, Sarah Persing, Abiy Ambaye, John Mace
The University of Vermont, Burlington, VT

Objective: Accurately determining the surgical margin status is vitally important to surgical decision-making, adjuvant care, and clinical management options for breast cancer patients undergoing conservative surgery. In an attempt to improve the quality of pathology reporting, the College of American Pathologists (CAP) developed guidelines to standardize reporting of surgical margin status. The aim of this study was to determine statewide concordance with CAP breast cancer reporting guidelines for margin status.

Methods: The Vermont Medicare Database represents services provided from 1998-2006 to 2,805 women aged 65 and older who underwent breast-conserving surgery at both small- and large-volume hospitals in Vermont. These data were accompanied by respective pathology reports and were analyzed for description of margin status for both invasive carcinoma and DCIS. CAP reporting guidelines originally developed in 1998 and updated as recently as 2009 were used as a standard to assess the degree of compliance of margin status reporting.

Results: From an original sample of 2,805, a total of 1,638 reports from the Vermont Medicare dataset met the inclusion criteria and were analyzed for margin status. Reports were considered guideline concordant for margin status if they described the status of each of the six margins as either positive or negative with a measurement of distance from the negative margin. Of the reports analyzed, only 34.5% adhered to the CAP guideline standards for margin status. Of the reports analyzed, only 34.5% adhered to the CAP guideline standards for margin status. Over the 8-year period, there was a significant rise in compliance with margin reporting from 4.7% in 1998 to 34.5% in 2006, chi-square trend test, p < 0.001. Of the 1,638 reports reviewed, factors resulting in noncompliant reporting included unoriented specimens in 37.3%, no mention of distance from negative margins in 43.2%, and complete omission of margin status report in 29.5%. Some cases contained more than one factor for noncompliance.

Conclusions: Breast cancer reporting of margin status varies widely. Vital information that affects surgical decision-making and treatment is often missing or incomplete. There is a positive trend that shows a significant rise in guideline compliance with reporting margin status from 1998 to 2006, however, overall compliance remains low. A better understanding of the barriers in adhering to CAP guidelines would greatly benefit the quality of pathology reporting and possibly subsequent care. This study provides evidence to support the need for quality improvement measures in the implementation of CAP guidelines for reporting margin status following breast conservative surgery.
Results: One thousand RSL breast procedures were performed in 978 patients; 21 patients had >1 RSL procedure. Mean dose was 63.5 ± 0.5 Gy. The principal indications for RSL included biopsy-proven malignancy (52%), in situ carcinoma (22%), sternal/osteal hyperplasia (11%), and uncertain/suspicious percutaneous biopsies (11%). For RSL, 148 patients had a single seed, 84, 2, 5, and 4, respectively. All patients were staged for surgery. All target lesions were successfully excised and all seeds were recovered at the time of surgery. Immediate response criteria for RSL were defined and published (with the surgery histology/pathologic correlation of the marker being close or obtaining the target lesion). Of the 767 malignant lesions excised, final pathology demonstrated a negative margin (22 mm) in 87% of invasive cancers and 77% of DCIS cases. Close (<2 mm) or positive margins were found in 9% and 5% of invasive cancers and 19% and 3% of DCIS cases, respectively. All cases demonstrated a negative margin (22 mm) in 87% of invasive cancer cases and 77% for DCIS. There was no evidence of a learning curve for RSL: the rates of margin re-excision, local seed, and seed complications did not change significantly when analyzing by the first 100 cases of accumulated institutional experience or by comparing the first and last 23 cycles for each of 3 surgeons.

Conclusions: Rendezvous seed localization is a safe and effective procedure that is easy to learn, associated with a lower incidence of positive/margin close than previously reported for wire localizations. We believe RSL should be the initial seed placement for definitive localization of breast cancer.

1721 MRI Staging After Neoadjuvant Chemotherapy for Breast Cancer: Does Tumor Biology Affect Accuracy? 
Katarzyna Mrzek-Matysiak, Jorge Torruella-Gonzalez, Hang Dang, Jessica Young, Atlita Sorn, Gretchen Ahrendt, Hang Dang, Steven Schonholz, John Turner, Phillip Gandelsman, John Kim

Mayo Clinic Arizona, Scottsdale, AZ

Objectives: MRI has been widely used as a second look examination after neoadjuvant chemotherapy (NAC) to better stage residual disease and plan treatment. Recent data showing that certain breast cancers may present a poor signal on MRI compared to their histological counterparts have raised the question of whether these tumors that appear invisible on MRI are truly ‘dormant’. We examined the accuracy of MRI in predicting residual tumor burden after NAC in patients with HER2-positive and triple-negative basal tumors. MRI is least accurate in predicting response in Luminal A/ER positive tumors, which is the most common breast cancer subtype.

Methods: A retrospective review of all MRI staging performed before and after NAC at our institution from 2004 to 2009 was performed. Data on patient demographics, radiologic and histologic outcomes, and the use of neoadjuvant chemotherapy were collected. One hundred and fifty-one patients who underwent surgery were included in the study. Pathologic response was defined as pathologic complete response (no residual invasive tumor or DCIS only) in 40/51 patients (78%). The difference between MRI tumor size and pathologic tumor size post chemotherapy was greatest in Luminal A patients (1.42 cm), followed by triple-negative basal subtype (0.99 cm) (p < 0.04). The least accurate tumor-size predictions were made in HER2-positive tumors. Tumor size on MRI demonstrated that 1.86 cm was the average pathologic tumor size with an average underestimation of 1.09 cm (range, 0-9 cm) post chemotherapy. The average pathologic tumor size was 1.86 cm. The average underestimation of tumor size was 1.09 cm.

Results: Definitive Diagnosis for High Risk Breast Lesions without Open Surgical Excision

1679 Definitive Diagnosis for High Risk Breast Lesions without Open Surgical Excision
Pat Whitehurst, Jim Simpson, William Polier, Steven Schonholz, John Turner, Phillip Gandelsman, John Kim

Northwestern University, Chicago, IL

Objectives: Our review, the largest to date within the literature, demonstrates that using tumescent solution during mammography with immediate tissue expander reconstruction, although possessing distinct advantages, is an independent and significant risk factor for minor mastectomy flap necrosis and surgical correction. Tumescent technique does not affect postoperative infection rates, indicating that electrocautery dissection is a suitable alternative for minimizing mastectomy flap creation. Combined operative technique should be made on individual patient basis with discussion of these relevant perioperative and postoperative risks prior to surgical consent.
Scientific Poster Forum Presentations
Methods: We reviewed our prospectively maintained database and identified all patients with DCIS who were treated with attempted BCT from 2004-2009. Only those who had close but negative margins and also underwent re-excision were included in the analysis. Margin index was calculated as follows: margin index = closest margin (mm) / tumor (mm) x 100. A receiver operating curve was created using the derived margin index and the presence or absence of residual disease in the re-excision specimen. Sensitivity and specificity were calculated at various margin indices to determine the optimum margin index.

Results: Of the 289 patients who underwent attempted BCT during the study period, 84 (29%) underwent re-excision for close or positive margins. Of the 84 patients undergoing re-excision, 36 (43%) had positive margins and were excluded from the study, 14 (17%) were excluded due to an inability to determine the preoperative size of DCIS on pathology reports, and 34 (40%) met study criteria and were included in the analysis. Of the 34 evaluable patients who underwent re-excision, 14 (41%) had residual disease in the re-excision specimen. There were no significant differences between patients who had residual disease and those who did not. The overall c index for the receiver operating curve was 0.71. However, there was no optimum margin index that reliably predicted the presence or absence of residual disease. For example, a margin index of >5 resulted in a sensitivity of 79% but a specificity of only 45%.

Conclusions: Margin index is not a reliable method for the prediction of residual disease after attempted BCT with close margins in patients with DCIS only. Although the study population was small, we believe this is likely a reflection of the complexities in accurately determining DCIS size and margin status in pathologic specimens. A prospective analysis of the margin index tool for DCIS patients undergoing BCT may be beneficial in overcoming these limitations.

2012

An Effective Intervention for Improving Symptoms and Quality of Life of Female Cancer Survivors: A Randomized, Controlled Study

Ruth Lerman1, Robert Jarvik2, Heather Rea3, Ronald Gellish3, Frank Vicini4

1Marilyn & Walter J. Dolin Comprehensive Breast Care Center, William Beaumont Hospital, Royal Oak, MI, 2School of Health Sciences and The Oakland University William Beaumont School of Medicine, Rochester, MI, 3School of Health Sciences, Oakland University, Rochester, MI, 4Oncology Services, William Beaumont Hospitals, Royal Oak, MI

Objective: For cancer survivors, completing treatment can be almost as difficult as going through it. Even though Mindfulness Based Stress Reduction (MBSR) methods may benefit survivors, randomized, controlled trials using standardized measures are limited. The primary objective was to evaluate the effects of a unique, interactive, 8-week cancer recovery program on symptoms and quality of life in female, predominantly breast cancer survivors utilizing standardized measures.

Methods: Sixty-eight female cancer survivors, including 52 affected by breast cancer, participated in four workshops offered through a major teaching hospital oncology department over the 12-month study period ending September 2010 using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-30), the Symptoms of Stress Inventory (SOSI), and the Symptoms Checklist (SCL-90-R). Participants were randomized into intervention or wait-listed control groups. Intervention group subjects practiced MBSR and mindful communication skills in weekly 2-hour workshops. Subjects practiced daily meditation and recorded daily logs. Assuming a medium effect size of 0.5, a power level of 80% and a two-sided alpha of 0.05, an estimated 64 patients (randomized 3:1) were required for parametric variables. Logs. Assuming a medium effect size of 0.5, a power level of 80% and a two-sided alpha of 0.05, an estimated 64 patients (randomized 3:1) were required for parametric variables.

Results: The MBSR-based intervention improved the symptoms and quality of life of this largely breast cancer survivor population.

Conclusion: The MBSR-based intervention improved the symptoms and quality of life in this largely breast cancer survivor population.
Scientific Poster Forum Presentations

1701
Serum 25-Hydroxyvitamin D and Prognostic Tumor Characteristics in Breast Cancer Patients
Aaron Rickles1, Luke Peppone1, Alissa Huston1, Kenneth Piazza3, Kristin Skinner1
1University of Rochester Medical Center, Rochester, NY, 2Roswell Park Cancer Institute, Buffalo, NY

Objective: Epidemiologic studies show that women with low 25-OH vitamin D levels have an increased risk of breast cancer incidence and mortality. Our prior research found 25-OH vitamin D levels were significantly lower in women with locally advanced breast cancer. However, there is a lack of research between vitamin D levels and prognostic variables in breast cancer patients. The aim of this study is to determine the association between 25-OH vitamin D levels, demographic variables, and prognostic tumor characteristics.

Methods: This study cohort consists of 155 women who underwent surgery at the University of Rochester Medical Center between 1/2009 and 9/2010. Vitamin D levels were obtained in the 1-year period prior to and after surgery (74% of vitamin D levels were within 6 months). Prognostic variables included age, race, menopausal status, Oncotype DXscore, TNM staging, ER status, PR status, HER2 expression, and gene expression. Linear regression and ANCOVA were used to calculate correlations and mean values, respectively, between prognostic variables and 25-OH vitamin D levels, while controlling for relevant covariates (age, race, and month of blood draw). Lastly, 25-OH vitamin D levels were dichotomized into optimal (≥32 ng/ml) and suboptimal (<32 ng/ml) categories. Logistic regression was used to calculate odds ratios (OR) for the dichotomous vitamin D groups and each prognostic variable while controlling for relevant covariates.

Results: Non-Caucasian breast cancer patients were significantly more likely to have suboptimal 25-OH vitamin D levels than Caucasian patients (OR = 3.8; p < 0.01). Premenopausal breast cancer patients had significantly higher suboptimal vitamin D rates than postmenopausal women (OR = 3.5, p < 0.01). A significant inverse correlation (r = -0.42, p = 0.04) between decreasing vitamin D levels and increasing Oncotype score was noted. Women with Oncotype scores <18 had a higher mean 25-OH vitamin D level than women with Oncotype DX scores >30 (>18: 32.0 ng/ml vs >30: 13.6 ng/ml; p = 0.13). Breast cancer patients who had ER+ and triple-negative breast tumors were more likely to have suboptimal levels of 25-OH vitamin D (ER+ OR = 2.4, p = 0.07) (triple-negative OR = 2.6, p = 0.09). Additionally, compared to women with in situ breast tumors, women with invasive breast tumors were more likely to have suboptimal vitamin D levels (Invasive OR = 2.4, p = 0.10) and lower mean 25-OH vitamin D levels (invasive: 30.5 ng/ml vs in situ: 36.9 ng/ml, p = 0.04). Lastly, women whose tumors expressed basal-like gene profiles had lower 25-OH vitamin D levels than women whose tumors expressed luminal-A gene profiles (basal-like: 25.1 ng/ml vs luminal-A: 30.6 ng/ml; p = 0.09).

Conclusions: Breast cancer patients with suboptimal vitamin D levels were more likely to have tumors with more aggressive tumor profiles and worse prognostic markers, lending support to previous research that found decreased breast cancer survival among vitamin D deficient individuals. In addition, this study found that suboptimal vitamin D levels were not only associated with poor prognostic markers of survival (ER+ and triple-negative tumors) but also increased risk of recurrence (Oncotype scores). Based on these findings, physicians should strongly consider monitoring and correcting vitamin D levels in breast cancer patients. Further research is needed to elucidate the biological mechanism between vitamin D and breast prognostic tumor markers.

### Table 1. Average serum 25-OH vitamin D by demographic and tumor characteristics

<table>
<thead>
<tr>
<th>Vitamin D Category</th>
<th>25-OH Vitamin D (ng/ml)</th>
<th>% of Patients</th>
<th>Odds Ratios (95% Confidence interval)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal</td>
<td>≥32 ng/ml</td>
<td>61</td>
<td>1.00 (Referent)</td>
<td></td>
</tr>
<tr>
<td>Suboptimal</td>
<td>&lt;32 ng/ml</td>
<td>39</td>
<td>0.93 (0.88-0.99)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>ER Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>54 and younger</td>
<td>25</td>
<td>0.98 (0.89-1.08)</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>55-56</td>
<td>25</td>
<td>0.97 (0.88-1.08)</td>
<td>0.15</td>
</tr>
<tr>
<td>Negative</td>
<td>67 and older</td>
<td>25</td>
<td>0.96 (0.89-1.04)</td>
<td>0.18</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>65</td>
<td>55.1%</td>
<td>0.49 (0.41-0.59)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Non-Caucasian</td>
<td>9</td>
<td>44.9%</td>
<td>1.00 (Referent)</td>
<td></td>
</tr>
<tr>
<td>Season of Blood Draw</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter/Spring</td>
<td>32.2</td>
<td>11.9</td>
<td>1.00 Referent</td>
<td></td>
</tr>
<tr>
<td>Summer/Autumn</td>
<td>28.0</td>
<td>13.2</td>
<td>0.37 (0.21-0.70)</td>
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<tr>
<td>Menopausal Status</td>
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<td></td>
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<td>Postmenopausal</td>
<td>35.5</td>
<td>14.0</td>
<td>1.00 Referent</td>
<td></td>
</tr>
<tr>
<td>Premenopausal</td>
<td>30.8</td>
<td>13.8</td>
<td>0.97 (0.89-1.06)</td>
<td>0.23</td>
</tr>
<tr>
<td>Invasive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>31.2</td>
<td>14.0</td>
<td>1.00 Referent</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>32.8</td>
<td>12.1</td>
<td>0.55 (0.39-0.81)</td>
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</tr>
<tr>
<td>Gene Expression</td>
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<td></td>
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<tr>
<td>Luminal A</td>
<td>30.6</td>
<td>12.7</td>
<td>1.00 Referent</td>
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</tr>
<tr>
<td>Luminal B</td>
<td>33.1</td>
<td>13.3</td>
<td>0.74 (0.54-1.01)</td>
<td>0.06</td>
</tr>
<tr>
<td>Basal-like</td>
<td>25.1</td>
<td>12.0</td>
<td>1.00 Referent</td>
<td></td>
</tr>
</tbody>
</table>

*Adjusted for age, race, and month of blood draw

### Table 2: Odds ratios (OR) and 95% Confidence Intervals for Sub-optimal Vitamin D Levels by Demographic and Tumor Characteristics

<table>
<thead>
<tr>
<th>Vitamin D Category</th>
<th>% of Patients</th>
<th>Odds Ratios (95% Confidence interval)</th>
<th>P-Value</th>
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<tr>
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</tr>
<tr>
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<td>54 and younger</td>
<td>25</td>
<td>0.98 (0.89-1.08)</td>
</tr>
<tr>
<td></td>
<td>55-56</td>
<td>25</td>
<td>0.97 (0.89-1.08)</td>
</tr>
<tr>
<td>Negative</td>
<td>67 and older</td>
<td>25</td>
<td>0.96 (0.89-1.04)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>65</td>
<td>55.1%</td>
<td>0.49 (0.41-0.59)</td>
</tr>
<tr>
<td>Non-Caucasian</td>
<td>9</td>
<td>44.9%</td>
<td>1.00 (Referent)</td>
</tr>
<tr>
<td>Season of Blood Draw</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Winter/Spring</td>
<td>32.2</td>
<td>11.9</td>
<td>1.00 Referent</td>
</tr>
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<td>28.0</td>
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<td>Postmenopausal</td>
<td>35.5</td>
<td>14.0</td>
<td>1.00 Referent</td>
</tr>
<tr>
<td>Premenopausal</td>
<td>30.8</td>
<td>13.8</td>
<td>0.97 (0.89-1.06)</td>
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<tr>
<td>Invasive</td>
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<tr>
<td>No</td>
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<td>25.1</td>
<td>12.0</td>
<td>1.00 Referent</td>
</tr>
</tbody>
</table>

*Adjusted for age, race, and month of blood draw
Poster Presentations
Compromised Margins Following Mastectomy for Stage I-II Breast Cancer
Fatema Al Mushawah, Rebecca L Aft, William E Gillanders, Timothy J Eberlein, Julie A Margenthaler
Washington University School of Medicine, St. Louis, MO

Objective: Margin status is a risk factor for local recurrence. Although re-excision for positive margins is standard in patients undergoing lumpectomy, it is rarely performed for positive margins following mastectomy. The reasons for this are multifactorial, including the ability to determine the exact margin for re-excision and reliance on adjuvant therapies. We sought to investigate the factors associated with positive margins following mastectomy and the impact on patient outcomes.

Methods: We identified 230 patients from our prospectively maintained surgical database with stage I-II invasive breast cancer who were treated with mastectomy (simple or modified radical) from 1999-2009. Data included patient and tumor characteristics, pathologic margin assessment, and outcomes. Margin positivity was defined by the presence of in situ or invasive malignancy focally or extensively present at any margin. Descriptive statistics were utilized for data summary and data were compared using chi-square.

Results: Of 617 patients with stage I-II breast cancer treated during the study period, 240 (39%) underwent mastectomy. Of the 240 patients, 132 (55%) had a simple mastectomy and the most commonly affected site was the deep pectoralis major muscle with 1 positive margin, 3 (14%) with 2 positive margins, and 6 (27%) with 3 or more positive margins. The most commonly affected margin was the deep margin (48%) of patients. Two of the 22 patients underwent re-excision for positive margins; no residual disease was identified. Eight (36%) of the 22 patients received adjuvant chest wall irradiation. There were no differences between patients who had a positive margin versus those who did not with respect to patient age, race, percentage of in situ component, tumor size, grade, lymphovascular invasion, or immunostain profile (p > 0.05 for all). At follow-up, none of the patients with positive margins experienced a local recurrence.

Conclusions: Positive margins following mastectomy occurred in nearly 10% of our patients, and the most commonly affected site was the deep pectoralis major muscle margin. This finding likely contributes to the observed low rate of re-excision. No specific patient or tumor characteristics predicted a risk for having a positive margin. Despite the finding that only one-third of patients received adjuvant radiation in the setting of a positive margin, no local recurrences have been observed.

1708 Factors Predicting Quality of Life in Women Undergoing a Breast Biopsy
Nicole Albrecht, Nguyen Tran, Laura Symonds, Janet Osuch, Bruno Giordani, Michael Bovin
Michigan State University, Grand Rapids, MI

Objective: Every woman who undergoes a breast biopsy faces the possibility of breast cancer. The associated stress invariably impacts the woman at many different levels. In this study, we investigate predictors of quality of life (QoL) in women who had a breast biopsy within the previous 4 months. We hypothesized that QoL would be related to biopsy diagnosis, as well as markers of psychological well-being, cognitive status, social support, spirituality, and sleep quality.

Methods: Participants were part of a larger study addressing QoL, spiritual and emotional well-being, cognitive performance, neuroactivation, and immunologic resilience in women newly diagnosed with breast cancer. Women with cancer were treated with breast preservation and prognosis assessed with Adjuvant! Online. Those ever diagnosed with breast cancer or diagnosed with any other cancer (except skin cancer) in the past five years were excluded. Measures included the Hope Quality of Life Scale, the Bottomley Social Support Scale, the Pq-9 Patient Health Questionnaire to assess depression, the Nelson Counseling Center Network Distress Management Screening Tool, the Spiritual Involvement & Beliefs Scale, the CogState Pairs Associate Learning Test, the STAI - State Anxiety short form, and Self-Reports of Cognitive Functioning and Sleep Quality. A multiple regression analysis (SAS v9.2) was performed to investigate the predictive value of the diagnosis, mood, social support, spirituality, and cognitive functioning on QoL, using a priori variables of age, income, and education level.

Results: Eighty-five women newly diagnosed with breast cancer (DCIS or ductal or lobular breast cancer) and 70 being staged were assessed, with an average age of 55.7 (range, 30-88; sd, 8.7). The groups were comparable on age, education, income, race, and menopausal status. Higher overall QoL was significantly associated (F = 13.20, p < .0001, adjusted R2 = 0.60) with older age (p < .0009), increased social support (p < .0003), lower depressed mood score (p < .03), lower distress score (p < .001), and higher levels of spirituality (p < .02). Measures of education, income, cognitive functioning, state anxiety, and sleep quality did not predict overall QoL. Although the Adjuvant! Online score was not related to overall QoL, it was associated with lower social and increased spiritual QoL subscale scores.

Conclusions: Women’s perception of their QoL shortly after a breast biopsy is strongly related to their perception of social support, mood, spirituality, and self-reported level of distress. Younger women appear to be less satisfied with their QoL during this period. Feelings of depressed mood and a general sense of distress represent important issues to address during this period through strengthening social support and strengthening self-reported level of distress. Older women appear to be less satisfied with their QoL during this period. Feelings of depressed mood and a general sense of distress represent important issues to address during this period through strengthening social support and strengthening self-reported level of distress.

1732 Screening Mammography Is Identified in the 40- to 50-Year Age Group
Laia Allende, Sonia Ortiz, Robert Quinlan, Anne Larkin, Ashraf Khan, Nilima Patwardhan
University of Massachusetts, Worcester, MA

Objective: Screening mammography is associated with a significant decrease in breast cancer mortality. The new U.S. Preventive Services Task Force guidelines on breast cancer screening recommend routine screening mammography starting at age 50. We did a retrospective review of our breast cancer patients between ages 40 to 49 to determine if the breast cancer diagnosis was established by imaging/mammography.

Methods: During the period from 2004 to 2009, breast cancer patients were selected from the tumor registry database. A subset of 583 women, ages 40 to 49, were included. Cancer was defined as invasive or ductal carcinoma in situ (DCIS). Of these, 240 patients with lobular carcinoma in situ (12 cases), large tumors (>25 mm), patients with locally advanced cancers and metastatic disease. A total of 361 cases with breast cancer were analyzed. DCIS was present in 90 (27%) and invasive carcinoma in 265 (73%) of 361 patients with breast cancer.

Results: Screening mammography identified 284 of 361 (79%) of breast cancers in women ages 40 to 49. Screening mammography detected DCIS in 94% of patients and invasive cancer in 194 of 265 (73%). Breast cancer was detected by patients or clinicians in 58/284 (20%) of the cases and by magnetic resonance imaging (MRI) in 19/284 (6%). Invasive breast cancer was identified in 93 patients with tumors less than 10 mm in size. Of these, 76 (82%) were detected by mammography and 17 (18%) detected by MRI.

Conclusions: During the period from 2004 to 2009, screening mammography identified more than 79% of the breast cancers in women ages 40-49 as an independent marker.
Sentinel Lymph Node Biopsy in Patients Undergoing Neoadjuvant Chemotherapy
Jani Anur, Carol Reynolds, James W Jakub, Amy C Degnim, Judy C Boughey

Poster Presentations

Janani Arun, Carol Reynolds, James W Jakub, Amy C Degnim, Judy C Boughey
Mayo Clinic, Rochester, MN

Objective: Sentinel lymph node (SLN) biopsy after neoadjuvant chemotherapy for breast cancer patients remains controversial. We aimed to assess the incidence of positive SLNs and additional nodal disease on completion axillary lymph node dissection (CALND) in cases with a positive SLN following completion of neoadjuvant chemotherapy.

Methods: We retrospectively analyzed all patients who completed neoadjuvant chemotherapy and subsequently underwent SLN biopsy at time of definitive breast surgery between January 2000 and July 2010. Intraoperative frozen section of the SLN was performed in all cases.

Results: Of 33 patients undergoing SLN biopsy, 30 patients (91%) were clinically node negative and 3 patients were node positive by fine needle aspiration biopsy at presentation. SLNs were identified in all (100%) cases. Ten patients (30%) had positive SLNs and one additional patient had isolated tumor cells. Intraoperative frozen section analysis detected the metastatic disease in 9 of 10 node-positive cases (90%). All nine cases underwent immediate CALND and additional nodal disease was found in six patients (65%). The one case with delayed positive SLN had a 1.3-mm micrometastasis noted in one of three SLNs and the patient elected not to pursue further surgery. In one case, a metastasis measuring 0.02 mm was seen only on immunohistochemical staining of another section of the same SLN. The total number of patients with nodal disease was 18, with 7 of the 18 patients (39%) undergoing completion CALND and 11 of 18 patients with micrometastatic disease were found to have positive SLNs and was classified as node negative with isolated tumor cells and the patient did not undergo additional axillary surgery. The one delayed positive SLN lymph node metastasis measured 1.3 mm compared to average axillary node size of 10.0 mm vs 5.1 mm, p = 0.10.

Conclusions: Intraoperative histologic examination of SLNs appears reliable in patients after completion of neoadjuvant chemotherapy. Patients with micrometastases in SLNs after chemotherapy have a high rate of additional positive nodes and should undergo completion axillary dissection.

1707
Re-evaluating the Role of Axillary Clearance in Screen-Detected Breast Cancer Patients
Mitchell Barry, Malcolm Kell
Mater University Hospital, Dublin, Ireland

Objective: Currently, the gold standard for all invasive breast cancers without palpable/radiological apparent axillary lymphadenopathy is primary excision with sentinel node biopsy (SNB), which, if positive, mandates an axillary clearance. However, given the recent findings of the ACOSOG, Z0011 trial, it is unclear whether patients with asymptomatic screen-detected tumors derive any benefit by undergoing an axillary clearance with its attendant morbidities. Our aim, therefore, was to evaluate the role of axillary clearance in an asymptomatic screen-detected breast cancer population on frozen section intraoperatively.

Methods: Patients were recruited from a national screening program which offers women (aged 50 to 65) biannual mammography. Over a 2-year period, 519 screen-detected breast cancer patients were recruited. All patients were asymptomatic and had invasive disease and a tissue grade of 3 and underwent a standard axillary clearance. Patients were excluded if they had palpable or radiologically (axillary ultrasound) detected axillary nodes, in situ disease, or if they did not have a SNB or a T3 tumor. All patients undergoing breast-conserving surgery had radiotherapy.

Results: Of 519 patients in a national screening program that were clinically/radiologically determined to be axillary node negative, 110 (21.2%) had a positive SLN. All 110 (T1 = 60.9%, T2 = 39.1%) patients underwent completion CALND with a mean of 3.67 additional positive axillary nodes (range, 1-8). The average size of lymph nodes metastasis in these patients appeared larger compared to clinically node-negative patients at diagnosis (10.0 mm vs 5.1 mm, p = 0.10).

Conclusions: Intraoperative histologic examination of SLNs appears reliable in patients after completion of neoadjuvant chemotherapy. Patients with micrometastases in SLNs after chemotherapy have a high rate of additional positive nodes and should undergo completion axillary dissection.

1721
Which Is a Better Predictor of Outcome After Neoadjuvant Chemotherapy: Microscopic Disease in Bone Marrow or Lymph Nodes?
Anirban Bhattacharyya, Savitri Krishnamurthy, Ashutosh K Lodhi, Carolyn S Hall, Henry M Kuerner, Anthony Kuci
University of Texas MD Anderson Cancer Center, Houston, TX

Objective: Neoadjuvant chemotherapy (NACT) effectively reduces primary tumor size and converts node-negative (N0) patients in operable breast cancers to node-positive (BC) patients. However, the effect of NACT on minimal residual disease is unknown. Cancer cells that disseminate to bone marrow (disseminated tumor cells, DTCs) are identified in 30% of primary BC patients and independently predict survival. In current clinical practice, LN positivity following NACT is employed as a prognostic indicator. This study compared prognostic significance of minimal residual disease in bone marrow (DTCs) and LN positivity.

Methods: Clinical stage I-III BC patients from one tertiary cancer center provided informed consent to participate in an IRB-approved prospective study involving consecutive collection of bone marrow (5 ml) from bilateral iliac crests after completion of NACT. DTCs were identified using Ficoll gradient separation and cytospin followed by anti-pancytokeratin antibody (cocktail of AE1/AE3, CAM5.2, MNF116, CK8, CK18) immunostaining. The presence of any cytokeratin-positive cell with morphological features consistent with those of tumor cells was considered positive for DTC. LN status prior to NACT was determined by axillary ultrasound and FNA of any suspicious LNs. LNs were collected intraoperatively, paraffin-embedded, sectioned, and microscopically evaluated for tumor invasion. Micrometastatic LNs were defined as tumor invasion between 0.2-2.0 mm. The presence of DTCs was also correlated with standard prognostic markers including T size, estrogen receptor, progesterone receptor, and HER2 status of the primary tumor.

Results: We prospectively evaluated 96 patients. Mean age was 51 years and median follow-up was 25 months. Nine percent had T1, T2, T3, T4 tumors. Prior to NACT, 20% were N0; 34%, N1; 4%, N2; and 42%, N3. Fifty-seven percent (52/90) had pathologically positive LNs removed at the time of surgery, of which 19% (10/52) had micrometastatic LNs. DTCs were identified in 27% (24/88) of patients post-NACT. No significant associations were observed between DTCs and LN positivity or any other clinicopathologic variables. Twenty-one percent (5/24) of DTC positive patients died (log-rank, P: 0.02), compared to 20% (2/10, P = 0.27) of patients with micrometastatic LNs. The Cox proportional hazard ratio (HR) for DTCs was 4.93 (1.18-20.66, P = 0.03), whereas micrometastatic LNs had an HR of 2.65 (0.83-13.17, P = 0.13).

Conclusions: Minimal residual disease in bone marrow, but not in LNs, was a significant predictor of outcome following NACT. Bone marrow aspiration for DTCs may offer important prognostic information independent of LNs and standard primary tumor markers.

1648
Receptor Changes in Metachronous Breast Cancer—Our 10-Year Experience
Jasneet Bhullar, Linda Dubey, Lorenzo Ferguson, Yousif Goriel, Sumet Silapaswan, Vijay Mittal
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Objective: All patients with breast cancer are at risk for synchronous and metachronous tumors. We attempted to examine the pattern of receptor expression and conversion in metachronous tumors as compared to the primary tumor. Our objective aimed at establishing a relationship between the subsequent metachronous tumor and also the response to therapy.

Methods: Reviewed charts of 108 women diagnosed and treated for primary breast cancer presenting with metachronous cancer over the past 10 years. The significant factors analyzed were age, grade, size, location of the tumor, hormone receptor status, HER2, and treatment received. Patients with metastasis and regional recurrence were excluded.

Results: Mean age at diagnosis was 59.4 years and subsequent second primary was within 2.2 years. Of 35 patients with ER+/PR+ in the primary, 24 (68%) retained the status in the metachronous tumor. From 49 patients with ER-/PR- in primary, 40 (82%) retained status. Among 22 patients with ER-/PR+, 16 (73%) retained the receptor status in metachronous tumors. Thirty-two patients started from ER- to ER+, and four converted from ER+ to ER-. The highest concordance of 93% was seen with PR- primary tumors which retained status in 60 metachronous tumors from 65 primary tumors. Unusually no ER+/PR- combination was found in either the primary or metachronous tumor group. Most HER 2- tumors (22/31, 71%) remained negative, but 50% (8/16) of HER 2+ (Grade 3) receptors became negative (Grade 0). Twenty-eight patients received both chemotherapy and radiation and 36 did not receive either. Thus we noted that therapy was not strongly associated with receptor changes except for Herceptin.

Conclusions: Most metachronous tumors retained the ER/PR expression patterns of the primary tumor irrespective of the treatment for the primary tumor. Half of primary HER2 expression was lost in metachronous tumors most probably due to Herceptin therapy. Metachronous tumors are least likely to have ER+/PR+ status.
Preoperative Predictors of Nipple-Areolar Complex Involvement in Patients Undergoing Mastectomy for Breast Cancer
Julie A. Bitter, Jimylos C. Queck, Richard J. Gray, Napil Wasif, Barbara A. Pockaj
Mayo Clinic in Arizona, Phoenix, AZ

Objective: Nipple-sparing mastectomy has gained wider acceptance as a surgical option to improve cosmetic outcomes for patients undergoing mastectomy for breast cancer. Recognizing which patients are at risk for pathologic nipple areolar complex (NAC) involvement is best done preoperatively for both surgical planning and patient education. We aimed to identify the preoperative factors that were most predictive of NAC involvement.

Methods: A retrospective review was performed of a prospectively collected database of patients undergoing mastectomy for DCIS or invasive breast cancer at a single institution from January 2005 through August 2010. Cases with NAC involvement (NI+) were confirmed by pathology and compared to those without NAC involvement (NI-). For nipple-sparing mastectomies, pathology was determined by sampling the nipple base. Continuous variables were compared using two-sample t-tests, and categorical variables were compared using chi-square tests. A multivariate analysis was performed to determine the factors most predictive of NAC involvement.

Results: A total of 45 nipple-sparing, 107 skin-sparing, and 240 standard mastectomies were evaluated. Two attempted nipple-sparing mastectomies were converted to skin-sparing mastectomies due to positive frozen section. The overall incidence of NAC involvement was 15% (n = 62). Eighty-five cases (22%) had patient or breast characteristics, 52 cases (14%) had nipple characteristics, and 4 cases (1%) had radiographic characteristics. Of the 62 NI+ patients, 60 (97%) had a positive mammogram, 28 (45%) had a positive ultrasound, and 23 (37%) had positive imaging. Tumor-to-nipple distance (TND) was reported on imaging in 54% of cases. TND was close in the NI+ than the NI- group (mean, 2.0 cm vs 4.7 cm, respectively; p < 0.0001). Sixty-three percent of NI+ tumors were <2 cm from the nipple, compared to only 21% of NI- tumors with known TND (p < 0.0001). However, for all cases with TND >2 cm, the majority were still NI-. (Table). On multivariable analysis, the only preoperative predictors of NAC involvement on pathology were the presence of NAC symptoms or exam findings (OR, 5.55; 95% CI, 2.83-10.77) and the involvement of the NAC on imaging (OR, 5.55; 95% CI, 2.41-12.81). Tumor grade, hormone markers, and angiolymphatic invasion did not bear any influence on NAC involvement.

Conclusions: The only significant preoperative predictors of pathologic NAC involvement are the presence of clinical exam findings and imaging that demonstrates extension to the NAC. The absence of these factors collectively increases the likelihood of a patient having NAC involvement which should be considered when determining patient candidacy for nipple-sparing mastectomy. Although the majority of NI+ tumors were <2 cm from the nipple, TND alone is not a reliable predictor.

Table I. Patient demographics

<table>
<thead>
<tr>
<th>Tumor-to-Nipple Distance by Imaging</th>
<th>NAC Involvement</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Yes</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>&lt;2 cm (n = 61)</td>
<td>59%</td>
<td>41%</td>
</tr>
<tr>
<td>2-4 cm (n = 10)</td>
<td>88%</td>
<td>12%</td>
</tr>
<tr>
<td>&gt;4 cm (n = 86)</td>
<td>93%</td>
<td>7%</td>
</tr>
</tbody>
</table>

1629

Comparative Prognostic Significance of Sentinel Lymph Node Biopsy and Axillary Lymphadenectomy in Carcinoma of the Breast
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Objective: It was determined that the enhanced pathologic assessment for nodes identified by lymphatic mapping/sentinel lymph node biopsy will identify patients with small metastases, resulting in a significant decrease in the rate of axillary dissection and an increase in the rate of breast conservation. This study compares the prognostic accuracies of axillary lymphadenectomy (ALND) and SLNB in patients with carcinoma of the breast, operated on by a single surgeon during the period 1991-2004.

Methods: An Institutional Review Board-approved retrospective analysis of a prospectively maintained database of breast cancer patients was searched and all node-negative women were identified. This database was compared to a prospectively maintained database of breast cancer patients who underwent ALND from 1991-1996 and 238 patients assessed by SLNB from 1997-2004. The demographics of these cohorts were compared using chi-square analyses. Disease-free status was calculated for both groups and compared. Results: The ALND and SLNB cohorts were statistically similar (Table 1). Although there were no statistically significant differences in the demographics, women from the ALND cohort had a slightly higher stage migration and better outcomes for pN0(i-) patients. This study demonstrates equivalent prognostic ability for sentinel node biopsy and axillary lymphadenectomy.

Conclusions: This dataset demonstrates equivalent prognostic ability for sentinel node biopsy and axillary lymphadenectomy as assessed by disease-free survival at a median follow-up of almost 6 years. These two cohorts are similar in age, stage of disease, grade, and extent of use of adjuvant chemotherapy. Significant differences exist in the frequency of breast-conserving surgery and radiation therapy, perhaps reflecting more frequent and more sensitive screening mammography in the cohort operating span from 1997-2004.

1662 Sentinel Lymph Node Biopsy in Pure DCIS: Is It Necessary?
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1Achibdem Bakirkoy Hospital, Department of Surgery, Istanbul, Turkey, 2Haseki Research Hospital, Department of Surgery, Istanbul, Turkey, 3Achibdem Bakirkoy Hospital, Department of Pathology, Istanbul, Turkey

Objective: Sentinel lymph node biopsy positive for pure DCIS has been a matter of debate in the recent years. The current study is aimed to determine the factors that influence the decision to perform SLNB in patients with DCIS.

Methods: Of 637 patients with breast cancer between July 2000 and July 2010, 62 patients (9.7%) with pure DCIS underwent axillary dissection. The overall incidence of SLNB positivity was 14.2% (p = 0.01). Twenty-eight patients (45%) were found to have pure DCIS, and 5 (8%) had microinvasive disease associated with DCIS. Median age was 51 (range, 30-79). Of patients with pure DCIS, mastectomy was performed in 28 patients (49%), whereas 24 patients (39%) underwent breast-conserving surgery. Thirty-six patients (56%) with pure DCIS underwent SLNB, and 3 of them had a positive SLNB. Of patients with SLNB positivity, 25% were found to have isolated tumor cells (ITCs), whereas 5 patients (5.6%) were found to have macrometastasis (2.8%). Axillary lymph node dissection was performed in one patient with SLNB, and in one patient with macrometastasis. In all three cases with SLN metastases, only one sentinel lymph node was involved with tumor cells, whereas all the other sentinel and nonsentinel lymph nodes were found to be reactive. Patients who underwent SLNB, were more likely to have a tumor size >30 mm or DCIS with high nuclear grade or necrosis or a macrometastasis due to extensive disease. Other factors, including age >50, estrogen or progesterone receptor status, or c-erbB2 positivity, did not significantly influence the surgeon’s decision to perform SLNB.

Conclusions: In our series, we found a relatively higher SLNB positivity in patients with pure DCIS than the large series reported elsewhere. This may either be due to the meticulous excision of SLNs by sentinel sectioning technique or due to our patient selection criteria or both. Although the importance of presence of ITCs in SLNs has not been clarified yet, it may be reasonable to perform SLNB in selected patients with pure DCIS.

1646 Surrogates Avoid Preoperative Wire Localization Using Sonographically Visible Breast Biopsy Marker Clips?
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Objective: Preoperative wire localization to guide resection of nonpalpable breast lesions is resource-intensive. We assessed if clip-based-marker clips placed at biopsy are detectable by surgeons before and during surgery using 2D ultrasound, if target visibility was enhanced using 3D ultrasound, and if ultrasound visibility impacts final surgical margin adequacy.

Methods: Patients presenting for consultation with 4 weeks of ultrasound-guided breast biopsy and clip placement were eligible for this prospective IRB-approved pilot study. 2D and 3D ultrasound clip localization rates were rated by surgeons preoperatively and intraoperatively from 1 (not visible) to 5 (clearly visible), with 4 or 5 deemed adequate. 3D and 2D vascular Doppler were compared and correlated with margin status. The Wilcoxon signed rank test was used to analyze differences.

Results: Of 25 patients with 26 lesions, Twelve (12) of 18 (67%) who underwent lumpectomy had 2D ultrasound clip visibility rated 4 or 5 preoperatively, while 6 of these 12 (50%) also had adequate clip visibility intraoperatively. There were 5 patients with clip and lesion visibility rated 4 or 5 preoperatively that also had clip and lesion visibility rated 4 or 5 at surgery. Surgeons consistently rated clip and lesion visibility as better with 2D than with 3D ultrasound (p < 0.01). Of 44 paired 2D and 3D clip assessments, 3D visibility was better at 1 rank level in 4 cases, but 2D was better at 1.5 levels in 17 (39%). For lesions, 3D visibility was better by 1 rank level in 2 cases, but 2D was better by 1.5 levels in 14 (32%). Among the patients undergoing lumpectomy for cancer, 5 (33%) had inadequate surgical margins. Of the 5 patients with clip and lesion 2D ultrasound visibility of 4 or 5 at both time periods, final margins were adequate for 3 (60%) and inadequate for 2 (40%).

Conclusions: Intraoperative surgery-directed ultrasound target localization may be feasible in patients with adequate preoperative visualization of both marker clip and lesion. The addition of 3D to 2D ultrasound did not enhance clip or lesion visualization, nor did adequate intraoperative ultrasound visibility eliminate the possibility of inadequate surgical margins for malignant lesions.
Objective: Phyllodes tumors are uncommon biphasic breast tumors that usually occur in adult females. They are composed of a connective tissue stroma and epithelial elements. The present study demonstrates the recent experiences in diagnosis, surgical management and clinical follow-up of this disease.

Methods: We retrospectively reviewed the medical records and pathological slides of 164 patients with phyllodes tumors that had undergone surgical treatment at the Department of Surgery, Samsung Medical Center, from January 1995 to July 2009. Clinical data analyzed included age, type of surgery, tumor size, location, time to recurrence and metastasis, previous surgical history, a number of the tumor, resection margin. Pathological characteristics of the tumors such as mitosis, tumor margins, cellular pleomorphism, and stromal pattern were examined.

Results: The mean follow-up was 34.0 months (range, 2.7-17.93). The median age of the patients was 43 (range, 11-72). The tumor size ranged from 1.0 cm to 30.0 cm, with a median of 6.1 cm. The most commonly performed surgical procedures were local or wide excision (414 case, 90.2%), mastectomy and MRM in 16 cases (9.8%). The pathologic diagnosis included 82 (50.0%) benign, 41 (25.0%) borderline, and 41 (25.0%) malignant phyllodes tumor. The tumor margin was infiltrating in 44 (26.8%) cases and pushing in 115 (70.1%) cases. A local recurrence was observed in 27 (16.1%) patients and distant metastasis developed in 4 patients with malignant phyllodes tumor. Bone metastasis observed in two patients and lung metastasis developed in one patient. Both bone and lung metastases were detected in one patient. The 5-yr disease-free survival rate of each histologic grade was 79.8%, 67.3%, and 37.9%, respectively (benign vs malignant, p = 0.025). A disease mortality occurred in only malignant phyllodes tumor patient and the 5-yr overall survival rate was 88.1%. Risk factors for local recurrence of a phyllodes tumor were a tumor size (p = 0.001) and an invasive resection margin (p = 0.007). Distant metastasis is associated with malignant histology (p = 0.002).

Conclusions: A positive resection margin and a size of tumor were the significant prognostic factors of local recurrence of phyllodes tumor. Distant metastasis of phyllodes tumor developed in only malignant phyllodes tumor patient. Since none of the pathological factors significantly affected the rate of recurrence, further studies are needed to define the risk factor for the management of phyllodes tumor.

1624 Is Accelerated Partial-Breast Irradiation Safe in Patients With an Intermediate or High Oncotype DX Score?

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Objective: Oncotype DX, a 21-gene assay, assesses the risk of distant recurrence in patients with estrogen receptor positive, node-negative breast cancer. A recently published study demonstrated that recurrence score (RS) is also an independent predictor of locoregional recurrence (LRR). The goal of our study was to assess whether accelerated partial-breast irradiation (APBI) was equivalent to whole-breast radiation in patients deemed to have high-risk tumors by Oncotype DX.

Methods: An IRB-approved retrospective chart review was conducted between April 2004 and December 2006. Forty-five patients (pts) with invasive breast cancer were identified: all had an intermediate or high RS (>18) and received APBI or whole-breast radiation following breast-conserving surgery. APBI was administered via balloon catheter brachytherapy; one pt received 3D conformal partial breast radiation. The primary endpoint was time to LRR. The secondary endpoints were time to distant metastases, and contralateral breast cancer.

Results: Of 45 pts, 26 had an intermediate RS and 9 had a high RS. Median age at diagnosis was 61. Mean tumor size was 1.52 cm (range, 0.3-4.5 cm). One pt was node positive. Ninety-six percent of pts had negative surgical margins. Forty-four (98%) had an intermediate or high RS received whole-breast radiation, 24 (67%) had APBI, and 1 (3%) received hormonal therapy and 12 (27%) received chemotherapy. Eleven of 36 (30%) pts positive. Ninety-six percent of pts had negative surgical margins. Forty-four (98%)

Conclusions: APBI is equivalent to whole-breast radiation therapy in pts with stage I or IIa breast cancer. Pts with an intermediate or high Oncotype DX score do not have a higher risk of LRR with APBI versus whole-breast radiation. These “high-risk” pts may be safely treated with APBI.

Table 1. Clinicopathologic features of patients with metastatic disease

<table>
<thead>
<tr>
<th>Case no.</th>
<th>Age</th>
<th>Histology</th>
<th>Tumor Size (CM)</th>
<th>LVI</th>
<th>Radiation Pathologic</th>
<th>Oncotype DX Score</th>
<th>ORS</th>
<th>Site of Distant Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>63</td>
<td>IDC</td>
<td>2.60</td>
<td>No</td>
<td>Partial</td>
<td>10/Intermediate</td>
<td>1.13</td>
<td>Liver</td>
</tr>
<tr>
<td>2</td>
<td>71</td>
<td>IDC</td>
<td>2.00</td>
<td>Yes</td>
<td>Partial</td>
<td>10/Intermediate</td>
<td>2.21</td>
<td>Axillary, lung, mediastinum</td>
</tr>
</tbody>
</table>

1716 Accuracy of Clinical Exam, Digital Mammogram, Ultrason, and MRI in Determining Post-Neoadjuvant Pathologic Tumor Response in Operable Breast Cancer Patients

Randall Croshaw1, Hilary Shapiro-Wright2, Erik Svensson3, Kathleen Erb4, Thomas Julian5
1Allegheny General Hospital, Pittsburgh, PA, 2SSM Healthcare-St. Clare Hospital, Fenton, MO

Objective: The purpose of this study is to determine the accuracy and predictive value of clinical examination and breast imaging for a complete pathological response (cPR) in breast cancer patients following neoadjuvant chemotherapy for locally advanced operable breast cancer.

Methods: An IRB-approved retrospective review was performed of data collected from patients treated with neoadjuvant chemotherapy or hormonal therapy between January 2005 and September 2010. Patients were evaluated by one of three surgical breast oncologists before neoadjuvant therapy and within 1 month of surgery by clinical breast exam (CBE), digital mammogram (DM), breast ultrasound (BUS), and/or MRI. The accuracy, negative predictive value (NPV), and positive predictive value (PPV) when compared to the final pathological report were analyzed. DCIS was considered as a positive pathologic diagnosis although it was evaluated separately.

Results: A total of 62 tumors in 61 patients with an average age of 56 (range, 34 to 87) were evaluated. The overall accuracy of CBE compared to the final pathological diagnosis was 54% with a NPV of 28% and a PPV of 87% in 52 available patients. Age over 50 increased accuracy to 70% with an increased NPV of 50% and slightly decreased PPV of 83%. For patients younger than 50, accuracy decreased to 32% due to the reduced NPV of 12%. The overall accuracy of DM was 71% with an NPV of 30% and a PPV of 82% in 49 available patients. Age greater than 50 improved NPV to 43% but did not affect accuracy or the other predictive variables. The overall accuracy of BUS was found to be 80% with an NPV of 33% and PPV of 85% in 54 available patients. Age did not appear to affect any variable except for improving PPV to 95% in patients under the age of 50. The overall accuracy of MRI was 70% with an NPV of 44% and a PPV of 77% in 40 available patients. PPV was also increased for patients under the age of 50 to 85%. When these methods are combined, the overall PPV was 40% for any two methods in agreement trending toward improvement to only 50% when considering radiologic methods only. The PPV for two or more methods in agreement at 84% was not improved. Controlling for the finding of DCIS on final pathology by excluding it had no significant effect on any method evaluated.

Conclusions: BUS was the most accurate predictor of final pathology in this patient population. All modalities had a PPV of greater than 75% for identifying the presence of residual disease which generally improved in the younger patients. No examination method, even when combined, was able to predict cPR as the NPV was less than 50%. In younger patients the accuracy and NPV were compromised even further.

Table 1. TEST

<table>
<thead>
<tr>
<th>TEST</th>
<th>Clinical Exam</th>
<th>Digital Mammogram</th>
<th>Breast Ultrasound</th>
<th>Breast MRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall accuracy</td>
<td>54</td>
<td>71</td>
<td>80</td>
<td>70</td>
</tr>
<tr>
<td>Overall PPV</td>
<td>87</td>
<td>82</td>
<td>85</td>
<td>77</td>
</tr>
<tr>
<td>Overall NPV</td>
<td>28</td>
<td>30</td>
<td>33</td>
<td>44</td>
</tr>
</tbody>
</table>

1757 BRCA Testing by Specialty--A Regional Review

Theresa E Cusick
University of Kansas - Wichita, Wichita, KS

Objective: BRCA status significantly influences the surgical recommendations for a newly diagnosed cancer patient. The testing may be done by the surgeon, medical oncologist, or referral to a genetic specialist. Surgeons began testing in the state of Kansas out of necessity. In an effort to determine if Kansas fell within standard guidelines for testing, a review was performed of genetic testing by specialty for Kansas, as well as the surrounding states.

Methods: Numbers of BRCA tests ordered on affected patients during the years of 2003-2005 were determined. The tests were divided into ordering groups of surgeon, medical oncologist, geneticist, and “other.” Genetic counselors ordering tests were listed under the MD specialty with whom they worked. Results for Missouri, Oklahoma, Arkansas, Kansas, and Nebraska were obtained and analyzed for each.

Results: Although the number of cancers by state did not change significantly, the number of tests ordered by all five states increased by almost 10-fold. If one considers that 20% of breast cancer patients appropriate for testing, none of these states were testing within this range in 2003. Only Missouri, Kansas, and Nebraska were testing at a 20% rate by 2008. Medical oncologists were responsible for ordering more BRCA tests than any other specialty in essentially all states. Nebraska had the highest percentage of tests ordered by a medical geneticist, as might be expected. Surgeons contributed a large volume of testing in Missouri and Kansas to place these states within the recommended appropriate testing range.

Conclusions: Surgeons should receive the instructions for BRCA testing. We cannot assume that another specialist within the cancer care system will recognize the need and proceed with testing of our patients. Failure to test may result in failure to counsel about surgical options and follow-up recommendations for high-risk patients. Testing at or above the 20% rate was aided in states where surgeons were actively involved in identifying and testing appropriate patients.
Five-year disease-free survival was 94% (87%, 97%) for the MDC group and 71% (62%, 78%) for the non-MDC group, respectively (p = 0.0304). Five-year disease-free and overall survival rates were determined for both groups. Women with MDC had a significantly lower incidence of lymph node-cancer (NMDC). The median tumor diameter of the MDC group was 20 mm, significantly smaller than the annual mammographic screening in this age group.

Comparison of the MammaPrint 70-Gene Expression Profile With Clinical Parameters in Patients With Breast Cancer

Objective:

We prospectively recruited women aged 35 and older at high risk for developing breast cancer. High-risk included a previous breast cancer diagnosis, personal history of lobular carcinomas in situ or atypical ductal hyperplasia (ADH), BRCA1 or BRCA2 carriers; or a 5-year breast cancer score of >1.7. All women underwent ductal lavage. Women found to have atypia on lavage specimens underwent ductoscopy-directed duct excision (Group 1). Women without atypia were observed (Group 2). Data included patient demographics, risk assessment, cytologic and histologic findings, and outcomes. Descriptive statistics were utilized for data summary and were compared using Fisher’s exact test.

Results: We enrolled 102 women; 93 (91%) were Caucasian. Their median age was 49 years (range, 14-73) with a median follow-up of 80 months (range, 5-90). Overall, 27 (26%) had atypical ductal lavage cytology (Group 1), while 75 (74%) had benign cytology. Subsequent duct excision in Group 1 patients revealed benign ductal histology in 11 (44%), papillomas in 9 (36%), ADH in 4 (16%), and ductal carcinomas in situ in 3 (14%). At follow-up, three patients developed breast cancer, including one Group 1 patient with atypical ductal lavage cytology but benign ductal histology and two Group 2 patients. There were no differences between Groups 1 and 2 with respect to patient demographics, risk level, Gail scores, or risk for subsequent breast cancer (p > 0.05).

Conclusions: Although 20% of high-risk women with ductal lavage atypia had ADH or malignancy on subsequent excision, the vast majority did not. Atypia identified by ductal lavage is not associated with a higher risk of developing subsequent breast cancer, even in this high-risk population.


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Objective:

Recently, the USPSTF recommended against annual mammography screening for 40-year-old women, unless the patient had a genetic mutation (BRCA1, BRCA2) or known radiation exposure. This 10-year retrospective chart review evaluates the potential impact these recommendations could have on women diagnosed with breast in the 40-49 age group.

Methods: The medical record database of our tertiary referral center was systematically reviewed to identify those women aged 40-49 treated for breast cancer over a 10-year period (1998-2008). The women were divided according to their methods of diagnosis: either mammographically detected cancers (MDC) or cancers that were detected clinically not by mammographic screening (non-MDC). Statistical analysis was performed to determine if there was a difference in tumor size, stage at presentation, family history, disease-free, and overall survival between the two groups.

Results: During the 10-year time period, 158 women were treated for breast cancer at our institution. Of these, 320 (20%) were between the ages of 40 and 49, 9 patients were excluded from the study due to incomplete records. Of the remaining 311 women, 147 (47%) underwent mammographic screening for diagnosis, and 164 (53%) were diagnosed by clinical symptoms or mammographically detected cancer (NMDC). The median tumor diameter of the MDC group was 20 mm significantly smaller than the NMDC group, 20 (p < 0.0001). Women with MDC had a significantly lower incidence of lymph node-positive cancer than the NMDC group, 28/113 (24.78%) vs 85/310 (27.09%), (p < 0.0001). Women with MDC had a significantly higher incidence of a family history of breast cancer than the NMDC group, 42.62% and 25%, respectively (p = 0.0034). Five-year disease-free and overall survival rates were determined for both groups. Five-year disease-free survival was 94% (87%, 97%) for the MDC group and 71% (62%, 78%) for the non-MDC group. Five-year overall survival rates for each group were 97% (92%, 99%) for the MDC and 78% (69%, 85%) for the non-MDC. In multivariate analysis mammographic screening, node negativity and smaller tumor size were found to be associated with a significant increase in survival.

Conclusions: This 10-year retrospective review demonstrates the importance of early detection and treatment of breast cancer to improve overall and disease-free survival. Mammographic screening in women aged 40-49 detected smaller tumors with less nodal metastasis resulting in improved survival supporting annual mammographic screening in this age group.

1753 Comparison of the MammaPrint 70-Gene Expression Profile With Clinical Parameters in Patients With Breast Cancer: Findings From a United States Cohort

Kern地段, Duk-Hwan Ahn, Leandra Silva, 1Esmerol Rivas, 1Agustín A García, 1Renu Serna

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Objective:

We used the MammaPrint 70-gene tumor expression profile as a powerful predictor of disease outcome in breast cancer. In addition, TargetPrint, a microarray-based test that measures the mRNA expression level of ER, PR, and HER2 was developed as an objective and more quantitative assessment of disease outcome in breast cancer. In addition, TargetPrint, a microarray-based test that measures the mRNA expression level of ER, PR, and HER2 was developed as an objective and more quantitative assessment of disease outcome in breast cancer. The correlation of these two tests with gene expression readouts by TargetPrint.

Methods: Mammaprint results were evaluated in fresh tumor samples from 89 breast cancer patients (clinical T1–4N0–2M0, median age, 64 [range, 40 to 95] years) collected by core needle biopsy (6) from a community-based breast cancer screening program at the U.S. hospitals from July 2008 to September 2010 (study protocol: MP 090). We compared treatment advice as recommended by NCCN guidelines and classification according to the 70-gene Mammaprint profile. A direct comparison was also made between Mammaprint and the Oncotype DX assay in a subset of patients. In addition, we compared BC/FSH assessments of ER, PR, and HER2 with gene expression readouts by TargetPrint.

Results: According to NCCN treatment recommendations, one patient did not require any adjuvant treatment (tumor size 0.6 to 1 cm, grade 1 disease, no lymph node involvement), this patient was also classified as low risk by Mammaprint. For five patients, NCCN recommendations could not be assessed due to a missing clinical risk score. In these patients, the 70-gene Mammaprint profile was used to determine the high risk and one low risk, according to Mammaprint. For the remaining 83 patients, NCCN guidelines recommended adjuvant endocrine therapy plus adjuvant chemotherapy (7) or recommended considering chemotherapy (5). Of these patients, 18 of these were classified as low risk by Mammaprint and the remaining as high risk. Comparison of microarray receptor results with BC/FSH performed at the U.S. hospitals indicated similar results with a concordance of 96% for ER, 95% for PR, and 96% for HER2. For 11 patients, the Oncotype DX assay was also performed, resulting in 1 patient classified as low risk and 10 patients classified as intermediate risk. All these patients were high risk, according to Mammaprint.

Conclusions: For the majority (95%) of these 89 breast cancer patients from U.S. hospitals, NCCN guidelines either recommended or suggested considering treatment with cytotoxic adjuvant chemotherapy, whereas Mammaprint indicated a low risk of recurrence in 22% of these cases. Integration of the 70-gene Mammaprint profile into clinical risk assessment and adjuvant treatment advice can provide added value for the management of early-stage breast cancer and potentially avoid unnecessary chemotherapy in low-risk patients.

1747 Surgical Outcomes of 63 Patients From an International Trial of Preoperative Concurrent Paclitaxel-Radiation in Locally Advanced Breast Cancer

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Objective:

Locally advanced breast cancer (LABC) is the most common presentation of breast cancer worldwide. In the United States, neoadjuvant therapy has become the standard of care for LABC. Recently, Adams et al reported a 34% pathologic response among 165 patients with LABC treated with taxane-based, preoperative chemoradiation. 5-year DFS and OS results were comparable to those of much more aggressive chemotherapy regimens in the neoadjuvant setting. As is reported for patients treated by neoadjuvant chemotherapy, the achievement of a pathologic response to chemotherapy reflected better DFS and OS. Importantly, a pathologic response occurred in 54% of patients with hormone-negative tumors. Since this approach is simple and cost-effective, it has attracted interest from several international centers. We report the surgical outcomes after taxane-radiation in 63 LABC patients treated in a multi-institutional clinical trial in India, South Africa, and the United States.

Methods: Women with LABC (stages IIB-IEC), ECOG performance status of 0 to 1, were eligible. Patients were treated with paclitaxel (30 mg/m2) intraoperatively twice a week for 6-12 weeks. Daily radiotherapy was delivered to breast, axillary, and supravacular lymph nodes during weeks 2-7 of paclitaxel treatment. At 1.8 Gy per fraction to a total dose of 45 Gy and a tumor boost of 14 Gy at 2 Gy/fraction. Seventeen of 63 patients received four cycles of docetaxel 60 mg/m2 and cyclophosphamide 600 mg/m2 prior to the paclitaxel-RT regimen. Mastectomy or lumpectomy, as decided by each surgeon, was performed 4 weeks after completion of preoperative treatment or upon recovery of chemoradiation-induced dermatitis. All patients had a level I/II axillary node dissection. Postoperatively, patients were randomized to paclitaxel and RT and postoperative ER/PR correlate with risk of endocrine therapy.

Conclusions: Preoperative paclitaxel with radiotherapy is relatively well tolerated. Risk of complication is similar to that reported in the literature for patients treated with neoadjuvant therapy. The highest morbidity was acute dermatitis. Infection with immediate breast reconstruction. Delayed reconstruction may be advisable for patients treated with neoadjuvant chemo-radiation.

Lumpectomy 2 0 8  2
Mastectomy 2 0 1 2

14
A Positive Intramammary Lymph Node Does Not Mandate a Complete Axillary Node Dissection

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Objective: Sentinel lymph node (SLN) biopsy is the standard method to stage the axillary regional nodal basin. Intramammary nodes (IMLN) are lymph nodes located outside of the axilla that are surrounded by breast tissue. There is a strong correlation of a positive IMLN with synchronous axillary disease. We hypothesized that even in the face of a positive IMLN a negative axillary SLN biopsy reliably stages the axillary basin and a complete axillary lymph node dissection (CALND) can be safely avoided. The purpose of this analysis was to assess this hypothesis using data from the published literature as well as data from an updated review of our institutional database.

Methods: A comprehensive search of the available English literature was performed to identify published retrospective reports of IMLNs and SLN biopsy. A total of 366 publications were identified meeting the search criteria. Manuscripts were reviewed to identify the status of the IMLN, SLN, and if a CALND was performed. Patients with a positive IMLN and a negative axillary SLN that underwent a CALND were identified. With IRB approval, a review of our prospective institutional breast surgical database was also performed. Patients with the same criteria as above were identified, and pathology reports were reviewed to assess the status of the SLN, IMLN, and CALND.

Results: Twelve publications met the selection criteria; this included six retrospective studies, five case reports, and a letter to the editor. From an initial pool of 27,328 breast cancer cases, only 14 cases had a positive IMLN, a negative axillary SLN biopsy and underwent a CALND. We next identified seven patients from case reports who also had a positive IMLN, negative axillary SLN biopsy and underwent a CALND. In all 21 cases, the CALND was negative. Of these cases had a negative axillary SLN and underwent CALND. Combining the literature review and our institutional data 24 patients were identified that had a positive IMLN but negative SLN biopsy and underwent a CALND. In all 24 cases, the CALND was negative.

Conclusions: These data show that axillary SLN biopsy accurately represents the disease status of the axilla in cases with a positive IMLN. CALND can be avoided in the setting of a positive IMLN and a negative axillary SLN biopsy.

Modern Surgical Approach to Paget Disease

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Objective: Paget’s disease (PD) constitutes between 1 and 3% of all breast malignancies. The small number of patients presenting with PD has often been suggested that candidates selected patients may be candidates for breast conservation. We sought to identify preoperative factors that would select patients for successful breast conservation and result in low local recurrence rates.

Methods: Fifty-one patients with PD underwent surgical therapy at our institutions between 1998 and January 2010. Using the Clinical Research Information System, clinical presentation of PD, preoperative imaging, pathological tumor characteristics as well as surgical, radiation, and axillary therapies were reviewed. Local, regional, and distant recurrences were captured with a median follow-up of 29 months.

Results: Nineteen of 51 patients (37%) underwent breast conservation with central lumpectomy while 32 patients (63%) underwent mastectomy. Physical finding was the most common presentation of PD as 36/51 patients presented with a change in the nipple-areolar complex. Twelve patients presented with palpable masses and all of these masses were treated with mastectomy. Twenty-two patients underwent mammogram that identified extensive abnormality requiring mastectomy. Twenty-six patients had negative mammograms, and 17 of these patients were treated with breast conservation. Twenty-three patients had MRI performed for surgical planning, and 18 had MRIs that reflected the extent of disease in the breast. Five patients had negative MRIs, and all had disease confined to the nipple-areolar complex. Twelve (37%) of the patients with an abnormal MRI results had no mammographic abnormalities noted. Seventeen of 19 patients who were treated with central lumpectomy received adjuvant radiation therapy. None of our patients had a local/regional recurrence at 29 months of follow up. One patient treated with breast conservation therapy and one treated with mastectomy developed a distant recurrence.

Conclusions: PD of the breast can be treated with breast conservation in a properly selected subset of patients. Successful breast conservation was achieved in patients without a palpable finding, a benign mammogram, and normal MRI. No local or regional recurrences were successfully treated with breast conservation. Twenty-three patients had MRI performed for surgical planning, and 18 had MRIs that reflected the extent of disease in the breast. Five patients had negative MRIs, and all had disease confined to the nipple-areolar complex. Twelve (37%) of the patients with an abnormal MRI results had no mammographic abnormalities noted. Seventeen of 19 patients who were treated with central lumpectomy received adjuvant radiation therapy. None of our patients had a local/regional recurrence at 29 months of follow up. One patient treated with breast conservation therapy and one treated with mastectomy developed a distant recurrence.

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Breast-Specific Gamma Imaging Influences Surgical Management in Patients With Breast Cancer

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Objectives: Breast-specific gamma imaging (BSGI) is a physiologic approach to breast cancer detection that can be used to obtain more detailed imaging of breast cancers than mammography or ultrasound. It has previously been shown to have greater specificity than MRI in the detection of breast cancer. The purpose of this retrospective study was to evaluate how often BSGI resulted in additional imaging and biopsies, and how often it changed surgical management in patients with breast cancer.

Methods: Charts were reviewed for 278 patients who had surgery for breast cancer from Jan 2008 to May 2010. Most patients had preoperative evaluation with either BSGI or MRI. Patients who underwent MRIs were not included in this study. Patients who were initially considered by the breast surgeon to be eligible for breast-conserving therapy (BCT) and who did not have BSGI were evaluated to determine how many ultimately had mastectomies. Patients who may have been eligible for BCT but underwent mastectomy for unrelated reasons (eg, personal preference, contraindications for radiation) were excluded from the analysis. Additionally, the number of patients who underwent additional imaging and biopsies, and the rate of those biopsies, was analyzed.

Results: A total of 132 patients were considered by the breast surgeon to be eligible for BCT based on physical exam and available imaging before BSGI. Surgical management was changed to mastectomy in nine (6.8%) of those patients based on the results of BSGI. Review of the final pathology reports showed that all of these patients would not have been candidates for breast conservation (due to extent or multicentricity of disease). Eleven patients who were initially thought eligible for BCT based on BSGI required re-excisions and ultimately mastectomies after BCT due to persistently positive surgical margins. This was most often due to extensive DCIS. A total of 40 (30.3%) patients required additional imaging due to findings on BSGI, and 25 (18.9%) required an additional biopsy. Ten of the 25 biopsies (40%) showed carcinoma. Of the 10 positive biopsies, 2 were in the contralateral breast.

Conclusions: BSGI is an effective method to evaluate the extent of disease in patients with breast cancer. Additional cancers were detected in 40% of patients who had additional biopsies prompted by BSGI. The rate of new foci of mammographically occult cancers identified by BSGI was slightly higher than rates previously reported for MRI. Of those patients thought to be eligible for BCT, 6.8% had mastectomies as a result of BSGI, and all of these were accurately identified as having disease not amenable to BCT; however, BSGI appeared to be less effective in the identification of patients who need mastectomy due to extensive DCIS. Larger studies are necessary to evaluate the role of BSGI in surgical management and to compare it to MRI.

1655

A Look Into the Ductoscope: Its Role in Pathologic Nipple Discharge

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Objective: Most breast cancers originate in the ductal epithelium with normal cells progressing to atypia to tumor to cancer. Many characteristic features of the ductal system and provides a method for directed excision and pathologic diagnosis. We sought to review our experience and findings with mammary ductoscopy in the evaluation of pathologic nipple discharge.

Methods: We retrospectively reviewed all patients who underwent ductoscopy for pathologic nipple discharge at our institution from 2006-2010. All procedures were performed by a single surgeon using a 0.9-mm Acuity scope and a video monitor with 60X magnification under general anesthesia. Data included patient and imaging characteristics, indications, operative findings, and pathologic outcomes. Descriptive statistics were used for data summary.

Results: During the study period, 122 patients underwent ductoscopy and directed duct excision for pathologic nipple discharge, including 62 (51%) with bloody discharge. Breast imaging (mammography, ultrasound, and/or magnetic resonance imaging [MRI]) revealed BI-RADS Category I/I excisions in 113 (93%), BI-RADS Category IV findings in 6 (5%), and was unknown in 3 (2%). Ductography was attempted in three patients; two were unsuccessful and one was negative for an intraductal defect. Final pathology revealed papillomas in 64 (53%) patients, duct ectasia and associated benign findings in 49 (40%) patients, ductal carcinoma in situ (DCIS) in 7 (6%) patients, and atypical ductal hyperplasia in 2 (1%) patients. No invasive cancers were identified in this cohort. Of the 7 patients with DCIS, 5 had bloody discharge. None of the patients with DCIS underwent pre-ductoscopy MRI, but all had BI-RADS Category I/I breast imaging. The extent of DCIS identified by ductoscopy and subsequent excision ranged from <1 cm to 10 cm (median, 3 cm).

Conclusions: Mammary ductoscopy is a useful tool in the evaluation of patients with pathologic nipple discharge. The diagnostic and therapeutic benefit of operative ductoscopy and directed duct excision is evident by the uncommon use of ductoscopy in our patient cohort. The majority of patients with pathologic nipple discharge have either benign nonspecific findings or benign papilloma. Although atypia and malignancy were diagnosed in only 7% of patients undergoing ductoscopy for pathologic nipple discharge, there were no routine imaging findings indicative of these diagnoses preoperatively.

1690

Ultrasound-Guided Lumpectomy for Palpable Breast Cancers

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Objective: Intraoperative ultrasound is increasingly utilized by the breast surgeon. Intraoperative ultrasound has been described as an alternative to needle localization in the excision of nonpalpable breast cancer during breast-conserving therapy (BCT). In contrast, surgical management of palpable breast cancers has not been as well described. We sought to determine the re-excision rate following BCT for palpable breast cancers using intraoperative ultrasound. A secondary aim was to investigate the impact on specimen radiography.

Methods: We reviewed our prospectively maintained database and identified 74 consecutive women who underwent ultrasound-guided lumpectomy for palpable breast cancer between 2006-2010. All procedures were performed by a single surgeon. The lumpectomy specimens were interrogated by ultrasound intraoperatively and cavity shave margins were taken when the ultrasound margin was <5 mm. Re-excision was performed for any histologic margin of 2 mm or less. Data collected included patient demographics, tumor characteristics, intraoperative findings, and pathologic outcomes. Descriptive statistics were utilized for data summary.

Results: During the study period, 74 women (mean age, 58 years) with clinical stage I (32, 43%), or stage II (55, 47%) breast cancer underwent ultrasound-guided lumpectomy. Tumor histology included 58 (78%) patients with invasive ductal cancer, 5 (7%) with invasive lobular cancer, 3 (4%) with ductal carcinoma in situ, and 8 (11%) with mixed/other cancers. The mean tumor size was 2 cm (range, 0.6 - 4.2 cm). Positive estrogen receptor status was observed in 51 (71%) patients, and 6 (9%) patients had Her2neu amplified tumors. Intraoperative, shave margins were taken in 46 (62%) of patients. The overall re-excision rate for ultrasound-guided lumpectomy was 23%, including 7 and 10 patients with positive margins <2 mm.

Conclusions: Although palpable breast cancers can be excised based on direct palpation or needle localization, we believe that ultrasound guidance provides an excellent tool to aid the breast surgeon. Intraoperative ultrasound impacts surgical decision-making, and nearly two-thirds of our patients had additional tissue taken as a result of the specimen interrogation. Only 9% of patients had a positive margin on final pathology as a result, and the overall re-excision rate was acceptably low. Further analysis will focus on a direct comparison of localization techniques.
1647
Should Patients With Invasive Lobular Carcinoma Be Considered “Cautionary” for the Use of Accelerated Partial Breast Irradiation?
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Objective: The American Society for Radiation Oncology (ASTRO) issued a consensus statement in 2009 regarding patient (pt) selection for accelerated partial breast irradiation (APBI) following breast-conserving surgery (BCS) for early-stage breast cancer. Pts with invasive lobular carcinoma (ILC) fall into a “cautionary” group for BCS. We report our single-institution experience with APBI in pts with ILC to determine safety and patterns of recurrence.
Methods: From January 2005 to November 2009, 24 pts with ILC treated with BCS and APBI were identified. Twenty-three pts received APBI via balloon catheter brachytherapy; one pt received 3-D conformal PBI. The primary endpoint was time to locoregional recurrence (LRR). Secondary endpoint was time to distant metastases.
Results: Median age at diagnosis was 67 and median tumor size was 1.3 cm. Median follow-up was 2.5 yrs. Of the 24 pts, 22 (92%) were node negative (N0), 1 (4.2%) was N1. One pt (4.2%) was HER-2/neu positive. Eighteen pts (75%) received hormonal therapy and three (12.5%) received chemotherapy. Eighteen pts (75%) had hormone receptor positive pathology.
Conclusions: In our initial cohort of pts with ILC treated with BCS and APBI, our overall LRR rate is superior to the literature. Our 5 yr LRR rate is 1.3% and the 3 yr LRR rate is 0%.

1625
Breast Cancer in the Octogenarian
Cara Guilfoyle, Jack Sariego
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Objective: The percentage of breast cancer patients who are elderly is clearly increasing. The concern is that the older patient—especially the patient over the age of 80—is being underdiagnosed and undertreated. The current analysis was designed to evaluate breast cancer in the elderly population and contrast it to the disease in the younger patient.
Methods: A retrospective review was performed of all breast cancer patients reported in the American College of Surgeons National Cancer Database from 1998 to 2005. The study cohort included all patients 80 years of age and older. Data collected included: stage at time of diagnosis, histologic type, and initial treatment performed. These data were then compared to those of patients under the age of 80.
Results: The 149,530 cohort patients comprised 10.6% of all breast cancer patients reported during the study period. There was a small but statistically significant difference in stage at the time of presentation: 15.3% of octogenarians presented with stage I disease compared to 16.2% of patients younger than 80.
Conclusions: Octogenarian patients comprise an increasing percentage of all patients diagnosed and treated with breast cancer. The octogenarians present with more advanced disease, suggesting either a more aggressive disease or a delay in diagnosis. Also, in all stages, the octogenarian patient is less likely to be treated with breast conservation initially.

1741
Improved Cancer Diagnostic Outcomes Obtained Through Surgeon-Performed Ultrasound Screening
Ian Grady1, Heidi Gorsuch-Rafferty2, Patricia Hadley3
1North Valley Breast Clinic, Redding, CA, 2Rockingham Memorial Hospital, Harrisonburg, VA, 3St成功的 saline. This will result in an increase in additional imaging studies, needle biopsies, and cost. It is our view that this disadvantage is more than offset by the benefit of detecting early-stage cancers in young women.

1719
Assessing the Ability of a CoC-Accredited Hospital Tumor Registry to Provide Recurrence and Survival Data
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Objective: CoC national cancer registries have been shown to be effective in capturing accurate cancer incidence data. They are uniquely positioned to contribute to clinical outcomes and quality improvement research through collection of recurrence and survival data; however, their ability to do so has not yet been assessed. The goal of this study was to: (1) compare Cancer Registry (CR) breast cancer distant recurrence (DR) data to breast center medical record (Meditech) data and assess the accuracy and completeness of disease status, (2) review CR methods of collecting and recording disease follow-up to evaluate effectiveness and accuracy of these processes, and (3) assess the utility of disease follow-up information as a data source for outcomes and quality measures research.
Methods: Patients selected were diagnosed with stage I-III breast cancer between January 1, 2001, and December 31, 2009, and were diagnosed with stage IV disease before June 1, 2010. Patients meeting criteria were obtained through Meditech search for records having breast procedure codes with corresponding breast cancer ICD-9 codes, and having subsequent inpatient visits with corresponding DR codes. This work resulted in 111 eligible patients. Eligibility and DR diagnoses were assessed using a chart review. Identical selection criteria were submitted to CR to obtain analogous patients. Case capture rates and DR codes were compared between both lists.
Results: CR successfully captured 100% of 111 DR breast cancer stage I-III cases. CR recorded a DR code for 62% of confirmed stage IV patients from Meditech. Of the remaining 38% (42 patients), 20 were ambiguously coded in CR as “never disease free” (code 70). Code 70 is a “placeholder,” and was used in 11% of all breast cancer cases during the study timeframe. CR recorded a site-specific DR code for 43% of cases. For the remaining patients, codes did not provide specific information on recurrence type or location. CR recorded a DR code matching the first DR diagnosed in Meditech in 37% of cases. DR codes appear in CR with significantly less frequency than they do in Meditech, indicating numerous DRs were recorded in Meditech and not captured by CR.
Conclusions: The initial focus of CoC national cancer registries has been to collect accurate cancer incidence data. Contributing hospital registries have additional and unique potential as an easily accessible and low-cost data source for clinical outcomes and quality improvement research. While our CR has been in compliance with CoC registry guidelines, the data show that current registry data on disease follow-up do not meet accuracy or completeness requirements necessary to be useful for research. The primary goal of collecting survival and recurrence data is not being achieved. The major reasons for lost or incomplete DR data were the result of CoC registry methods of capture and entry of disease follow-up information. Modification to these CoC-standard processes would drastically improve registries’ value to current breast cancer programs and research.
Local Recurrence of Ductal Carcinoma In Situ After Mastectomy: Does Resection Margin Status Matter?  
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Objective: Ductal carcinoma in situ (DCIS) accounts for about 25% of breast cancer diagnoses in the United States due to the advent of widespread screening mammography since 1980. Mastectomy remains a safe and viable surgical treatment option for DCIS. Margin status has been implicated as a significant risk factor for local recurrence. This study aims to elucidate the incidence and risk factors for DCIS recurrence in patients undergoing mastectomy.  
Methods: The medical records of patients with a histologic diagnosis of pure DCIS at City of Hope National Medical Center between 1/1980 and 12/2009 who underwent mastectomy were retrospectively reviewed. Relevant data analyzed included patient demographics, type of mastectomy, pathologic findings, margin status, and type and location of recurrence.  
Results: A total of 99 patients and 106 affected breasts were identified. Median age was 53 years (50-88). Median follow-up was 97 months (1-208). Procedure types included total mastectomy (61%), skin-sparing mastectomy (37%), and nipple-sparing mastectomy (2%). Immediate reconstruction was performed in 46% of cases. Median pathologic size of the DCIS in the mastectomy specimen was 4.5 cm (0.1-11). Eighteen patients (17%) had multifocal or diffuse disease, while 19 patients (18%) had negative margins for DCIS with positive biopsy margins. One patient (1%) had positive margin and eight patients (7%) had close (<5 mm) margins on the final mastectomy specimens. Overall recurrence rate was 4% and local recurrence rate was 2.8%. Two patients had local chest wall recurrence, one patient had locoregional recurrence followed by distance metastasis, and one presented with distant recurrence. Histologically, all of the recurrences belonged to intermediate grade. Two of the 8 patients (25%) with close margins (<5 mm) on initial mastectomy specimens developed chest wall recurrence; however, margin status was not a significant risk factor for local recurrence (p = 0.06).  
Conclusions: The risk of local recurrence in this series of patients who underwent mastectomy for DCIS is low and does not correlate significantly with margin status. Prior studies have advocated postmastectomy radiation for close or positive margins to decrease rate of local failure in DCIS patients. The low rate of recurrence for DCIS after mastectomy found in our study does not justify a recommendation for postmastectomy radiation therapy.

BRCA Mutations and Variants in Young Asian Women at Risk of Hereditary Breast Cancer  
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Objective: Mutations of BRCA1 and BRCA2 genes increase risk of breast cancer by age 50. Genetic testing may guide risk reduction strategies. Little is known about BRCA mutations in Asians. Our objective was to determine if frequencies of BRCA1 and BRCA2 mutations and variants of unknown significance (VUS) differ between Asians and Caucasians.  
Methods: Two hundred sixty women at risk of hereditary breast cancer were tested for BRCA1 and BRCA2 mutations and VUS between 2005 and 2009: 126 Caucasians, 68 Asians, 27 Blacks, and 39 other race. At risk was defined as having breast cancer before age 50, or a family history of breast or ovarian cancer.  
Results: Among women of all racial groups, there was no difference in frequencies of BRCA1 and BRCA2 mutations and VUS between Asians and Caucasians.  
Conclusion: No statistically significant differences in sensitivity, specificity, or accuracy were identified between the intraoperative detection of lobular carcinoma versus ductal carcinoma. The specificity has remained the same since 2004. However, the accuracy (82% vs 92%, p = 0.09) and sensitivity (52% vs 71%, p = 0.02) has improved since 2004.  
Methods: A retrospective database was reviewed to identify patients ages 40-49 with in situ and invasive breast cancer from 1984-2008. The method of detection of the breast cancer, mammographic versus palpable mass, was noted, as was the use of chemotherapy.  
Results: There were 709 eligible patients for whom information regarding adjuvant treatment was available. There were 412 (58%) patients diagnosed by mammography and 297 (42%) presenting with a palpable mass. Of the patients whose cancer was diagnosed by mammogram, 134 (33%) received chemotherapy. This compared to 222 (75%) patients who presented with a palpable mass and required chemotherapy. A patient in the 40-49 year old age group was 2.9 times more likely to receive chemotherapy if her breast cancer was diagnosed by a palpable mass than by mammography (odds ratio) (CI, 2.36-3.64; p < 0.0001) (Table 1).  
Conclusions: Our analysis demonstrates that a breast cancer patient age 40-49 is more likely to receive chemotherapy if her cancer is diagnosed as a palpable mass. The addition of chemotherapy to breast cancer treatment is costly in several ways--financial, physical, and emotional. This argues against recent USPSTF recommendations, and provides an additional benefit to performing screening mammography in this age group.
Features Associated With Abnormal Axillary Ultrasound in Breast Cancer
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H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL
Objective: Axillary staging with ultrasound has been adopted for preoperative planning in breast cancer patients. Our objective is to determine clinicopathologic features predictive of an abnormal axillary ultrasound (AUS) and/or positive axillary lymph node needle aspiration (FNA).
Methods: A single-institution database of newly diagnosed breast cancer patients was reviewed and identified 310 patients between March 2004 and September 2010 that had preoperative staging with axillary ultrasound. Pathologic, clinicopathologic, and results of axillary staging were reviewed and correlated to AUS and FNA. Univariable logistic regression and Spearman’s and Kendall’s Tau B correlation coefficients were computed to identify features that had a significant relationship with AUS (normal or abnormal) or FNA (positive or negative).
Results: Of the 310 patients reviewed, a total of 313 breast cancers were evaluated. Median patient age was 53 years (range, 23-86). Median clinical tumor size was 3.5 cm (range, 0.6-30). Two hundred fifty-two cases (80.5%) had invasive ductal carcinoma (IDC) histology; 24 (7.7%) had invasive lobular carcinoma (ILC) histology. Two hundred fifty (79.9%) of 313 cases demonstrated an abnormal AUS. FNA was performed in 247 cases, of which 167 (67.6%) were positive. One hundred forty-six patients had lymph node surgery (46.6%) and 206 complete axillary lymph node dissections (66.5%) were performed. Sensitivity of AUS for nodal disease was 91.8% with a specificity of 36.9%. FNA had a sensitivity of 86.1% and specificity of 100% for nodal disease. The false-positive rate for an abnormal AUS in tumors with IDC histology was 18.4%. Lymph node dissections (65.8%) were performed. Sensitivity of AUS for nodal disease was 91.8% with a specificity of 36.9%. FNA had a sensitivity of 86.1% and specificity of 100% for nodal disease. False-positive rate for an abnormal AUS in tumors with IDC histology was 18.4%.
Conclusions: AUS is an effective tool for preoperative staging in breast cancer. There are multiple clinicopathologic features that may guide judicious application of AUS.

Guided Pathological Sampling (GPS): Sensitivity of Axillary Specimen X-ray to Predict Nodal Count and Positivity
Chad Johnson
University of Arkansas for Medical Sciences, Little Rock, AR
Objective: The number of examined axillary lymph node has been proposed as an indicator not only of prognosis but of quality and adequacy in breast cancer staging surgery. Furthermore, some payor sources are denying reimbursement based on inadequate pathologic nodal examination. The purpose of this study was to compare pathologist with physicians who palpated axillary lymph node specimens with clinical scenario. We determined the number of lymph nodes retrieved and the potential use of ASX in guiding pathological sampling (GPS). In addition, we sought to determine the sensitivity and specificity of ASX in identifying nodal positivity.
Methods: Patients undergoing SLN and ALND were prospectively accrued to this double-blinded, single-assignment trial from 2/2008 to 9/2010. Ex vivo specimen magnified, compressed plain x-ray views were performed on all axillary tissue removed (ASX). A single physician interpreted all radiographs independent of the operation by counting the total number of lymph nodes on the film along with prediction of positivity by size, shape, density, and calcifications.
Results: A total of 17 female (age, 50 ± 18) patients were accrued to the study that included 15 axillary lymph node dissection specimens and 7 sentinel lymph node specimens. ASX located more lymph nodes when compared to final pathology results in 11 of 15 cases (73.3%). In these 11 cases, ASX identified 170 nodes and the pathologist located 132 (77.6% of the total lymph nodes seen on ASX). The median number of additional lymph nodes identified by the surgeon on ASX was 3 (range, 1-26). In 26.7% of cases, the pathologist found more nodes (median difference, 3.5; range, 1-6). Of the 15 ALND specimens, 8 were from patients who received neoadjuvant chemotherapy, and on final pathology these 8 had an average number of 14.6 ± 7.8 nodes. Prognostic receptor negative disease was associated with an abnormal AUS (p value = 0.20). Although not associated with a positive FNA (p value = 0.74), progesterone receptor negative disease was associated with an abnormal AUS (p value = 0.05). ILC histology did not correlate with either abnormal AUS or positive FNA.
Conclusions: ASX is an effective tool in identifying nodal count. This can be used for documentation of an adequate ALND as well as GPS. In addition, ASX is an inexpensive way of identifying an inadequate ALND reimbursement. Unlike popular consensus, number of nodes recovered after neoadjuvant chemotherapy is not less than in naïve patients. Further, there may be potential value of ASX in introperative determination of nodal positivity.

Significantly Better Cosmetic Outcome After Intraoperative Radiotherapy Compared With External Beam Radiotherapy for Early Breast Cancer: Objective Assessment of Patients From a Randomized Controlled Trial
Mohammad Keshtgar1, Norman Williams2, Tammy Corica, Christobel Saunders3, David Joseph3, on behalf of the TARGIT Trialists’ Group
1Royal Free Hospital, London, UK, 2University College London, London, UK, 3Sir Charles Gardner Hospital, Perth, Australia.
Objective: The international randomized TARGIT Trial started accrual in 2000 to determine if there is a difference in patient outcome using the technique of TARGIT using IORT (intr tumoral radiotherapy with Intrabeam®) (Carl Zeiss, Germany) as an alternative external beam radiotherapy (EBRT) in women with early, low-risk breast cancer suitable for breast conservation as primary treatment. The main outcomes assessed were cosmetic and clinical outcome at 1 year after completion of breast-conserving surgery. Of the 1014 women randomized, 649 completed the clinical examination at 1 year. In addition, 921 women completed the cosmetic examination at 1 year. We report here the 1 year data from a subprotocol assessing cosmesis in a subset of 114 women over 50 participating in the TARGIT Trial from one center (Perth, Australia).
Methods: Fo rmal breast photographs from 115 patients (59 TARGIT, 55 EBRT) taken at baseline and 1 year after completion of breast-conserving surgery were assessed blinded to randomized treatment using specialist software (BCCT-core 2.0; INESC, Porto, Portugal) which produces a composite score (excellent, good, fair, poor) based on symmetry, color, and scar. Statistical advice was provided by the Biostatistics Group, The Joint UCL, UCLH, and Royal Free Biomedical Research Unit.
Results: Median age at randomization was 62 (IQR, 56-68) years; photographs were taken before (baseline) and 1, 2, and 3 years after surgery; all patients were free from recurrence and none had subsequent surgery. The composite scores were combined into excellent/good (EG) and fair/poor (FP) cosmetic outcomes. Overall, patients in the TARGIT group attained EG significantly sooner than those in the EBRT group. A higher cumulative proportion of patients in the TARGIT group had attained EG by each of the three annual examinations post surgery, log-rank test, p = 0.0244. By 1 year post surgery 74% (SE 5.7%) and 56.4% (SE 6.7%) had achieved EG on the TARGIT and EBRT groups, respectively.
Conclusions: These results indicate the cosmetic effects of targeted radiotherapy using Intrabeam® are significantly improved compared to those obtained with conventional EBRT, particularly 1 year after surgery.

Presentation of Metachronous Breast Cancer: The Importance of Self and Clinical Breast Exams
Jessica L Kett, Paul J Tartter
St. Luke’s Roosevelt Hospital Center, New York, NY
Objective: Patients treated with breast-conserving surgery remain at risk of developing metachronous cancer in the ipsilateral or contralateral breast. Mammography and clinical exam remain critical in detecting local and these second primary cancers. We sought to determine the method of presentation of metachronous breast cancer, comparing this to the presentation of the first primary breast cancer.
Methods: A prospectively maintained database of 2300 breast cancer patients treated with surgery by an individual breast surgeon was reviewed to identify patients who developed metachronous breast cancer. Metachronous breast cancers were contralateral or, if ipsilateral, in a different quadrant than the first cancer, greater than 1 year after diagnosis of the primary tumor, and with pathology inconsistent with a local recurrence. The presentation of the primary breast cancer was compared to the presentation of the metachronous breast cancer. In addition, the presentation of ipsilateral metachronous cancers was compared to the presentation of contralateral metachronous cancers.
Results: After excluding patients with incomplete data, 136 patients with metachronous breast cancer were identified (Table 1). The presentation of metachronous cancers was comparable to that of the primary cancers, although patients palpated the primary cancer more frequently and physicians palpated the metachronous cancer more frequently. Fifty-three percent of primary cancers were identified on exam, physician or patient, and 50% of metachronous cancers by exam. Metachronous cancers were significantly more likely to be mammographically occult (p = 0.027). The presentation of contralateral metachronous cancers were compared to that of ipsilateral metachronous breast cancers (Table 2). The concordance of method of detection between the primary and second cancers was 43% and 22%, respectively. In addition, ipsilateral metachronous cancers were more frequently mammographically occult, however, not statistically significant. Overall, two patients (4%) had mammographically occult primary and ipsilateral metachronous cancer. Two patients (2%) with contralateral metachronal cancer had mammographically occult primary and contralateral metachronous cancers.
Conclusions: More than half of metachronous breast cancers are detected by patients’ self-exam or physicians’clinical exam, and 24% of these cancers are mammographically occult, therefore self-exam and clinical exam should be encouraged in breast cancer survivors. Although screening mammography continues to be an integral in the care of breast cancer patients, metachronous cancers are more frequently detected clinically. Therefore, clinical breast exams and patient self-exam in combination with mammography remain critical in detecting new breast cancers in breast cancer survivors.

Table 1- Presentation of primary and metachronous cancer

<table>
<thead>
<tr>
<th></th>
<th>Primary Cancer</th>
<th>Metachronous Cancer</th>
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<tbody>
<tr>
<td>Presentation</td>
<td>% (n = 136)</td>
<td>% (n = 136)</td>
</tr>
<tr>
<td>Califications</td>
<td>30% (41)</td>
<td>25% (34)</td>
</tr>
<tr>
<td>Mammographic density</td>
<td>16% (22)</td>
<td>20% (27)</td>
</tr>
<tr>
<td>Patient self-exam</td>
<td>31% (42)</td>
<td>21% (28)</td>
</tr>
<tr>
<td>Physician exam</td>
<td>22% (30)</td>
<td>29% (40)</td>
</tr>
<tr>
<td>Other</td>
<td>1% (2)</td>
<td>5% (7)</td>
</tr>
<tr>
<td>Mammographically occult</td>
<td>13% (18)</td>
<td>24% (33)</td>
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</table>

Table 2- Presentation of metachronous cancer

<table>
<thead>
<tr>
<th></th>
<th>Ipsilateral Metachronous</th>
<th>Contralateral Metachronous</th>
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<tbody>
<tr>
<td>Presentation</td>
<td>% (n = 45)</td>
<td>% (n = 92)</td>
</tr>
<tr>
<td>Califications</td>
<td>29% (13)</td>
<td>28% (21)</td>
</tr>
<tr>
<td>Mammographic density</td>
<td>16% (7)</td>
<td>23% (20)</td>
</tr>
<tr>
<td>Patient self-exam</td>
<td>31% (14)</td>
<td>15% (14)</td>
</tr>
<tr>
<td>Physician exam</td>
<td>22% (10)</td>
<td>28% (26)</td>
</tr>
<tr>
<td>Other</td>
<td>2% (1)</td>
<td>13% (10)</td>
</tr>
<tr>
<td>Mammographically occult</td>
<td>31% (14)</td>
<td>21% (19)</td>
</tr>
</tbody>
</table>
1637
Immediate Breast Reconstruction of Segmentectomy Defects Using Extended Autologous Latissimus Dorsi Flap via a Single Incision
Hisham Khalifa, Reham Oreaba
National Cancer Institute (NCI), Cairo University, Cairo, Egypt
Objective: The aim of this study is to describe the technique of extended autologous latissimus dorsi flap to reconstruct segmentectomy defects via single axillary incision and to assess the outcomes of this procedure.
Results: Acceptable results were noticed with this technique, regarding postoperative complications (four patients) with no further surgical intervention, sensory loss (nipple-areola complex, two patients; quadrant, eight patients), restricted activities (two patients). Considering aesthetic evaluation, very acceptable results were noticed regarding panel assessment and patient satisfaction.
Conclusions: This technique is associated with few adverse surgical and physical sequelae, without compromising cosmetic outcome, representing good alternative to mastectomy (if similar), and avoiding additional scars and use of prosthesis.

1664
Intraoperative Evaluation of Axillary Sentinel Lymph Nodes Using Touch Imprint Cytology and Rapid Immunohistochemistry
A Khan, M Hameed, N Uddin, N Sacks
Shuakat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan
Objective: Haematoxylin and eosin-stained frozen sections (FS) are traditionally used for the intraoperative evaluation of sentinel axillary lymph nodes. The aim was to compare FS with touch imprint cytology (TIC) and ultrarapid immunohistochemistry (IHC) as intraoperative diagnostic tools.
Methods: TIC and ultrarapid IHC (Choi et al. Jpn Clin Oncol 2006) were performed on 62 consecutive cases of fresh axillary sentinel lymph node biopsies and compared with FS. Permanent paraffin sections H&E diagnosis was taken as gold standard. TIC smears were prepared from every corresponding tissue submitted for frozen section. Ultrarapid IHC (CK AE1/AE3) took 25 minutes and was performed at the same time.
Results: Final diagnosis on paraffin section showed 27 cases with axillary sentinel lymph node metastasis, including 6 micrometastasis. The frozen section H&E detected 26 (96.3%) positive lymph nodes. One case of micrometastasis was missed on FS. TIC detected 21 (77.7%) metastasis; 6 metastasis were missed, including 5 micrometastasis. One case of metastatic carcinoma was missed due to poor smear technique. IHC detected 25 (92.6%) metastasis, 2 metastatic deposits failed to pick the immunostain, however, all cases of micrometastasis were positive. Final results are shown in Table 1. Consideration for age, ethnicity, history of breast feeding, hormonal contraception, surgical interventions (incision and drainage, excision, mastectomy), medical therapy, and observations. Logistic regression model was applied between cases and controls. Institutional IRB approval was obtained for this study.
Conclusions: IHC is a rare but debilitating inflammatory disease seen in younger women. Previously described risk factors were not confirmed by this study, although a trend toward breast feeding within 36 months of clinical presentation was seen. ILGM can lead to extensive surgical excision procedures, including mastectomies. A clinicopathologic analysis is presently underway to better elucidate potential causative factors.

1752
The Impact of the CED (Cavity Evaluation Device) on Infection Rates for Intracavitary Brachytherapy for Breast Cancer: A Single Institution’s Experience With 426 Patients
Jasleen Khuja, Steven Eric Olyjevar, Mark Ono, Aaron Abmirad, Charles Woo
Ironwood Cancer and Research Centers, Chandler and Mesa, AZ
Objective: The CED (Cavity Evaluation Device) is an FDA-approved device for evaluating breast cavities after breast-preserving surgery for intracavitary brachytherapy. It offers the theoretical advantage to the breast team for better identification of patients who are technical candidates for treatment. We present a single institution’s experience with the CED and its impact on infection rates.
Methods: Records of 426 patients who were consecutively treated with intracavitary brachytherapy at our institution either with or without CED were evaluated. Infection was defined as requiring either intervention or antibiotics during or within 30 days of completing therapy.
Results: Four hundred twenty-six patients underwent treatment with intracavitary brachytherapy with or without CED. A total of 36 surgeons implanted catheters in this group of patients. One hundred twenty-nine (30%) had implantation without CED (no CED) and all 129 were implanted with closed tunneling technique. Infections were found in three (2.3%) of these “no CED” patients. The remaining 297 (70%) patients were implanted with CED exchange technique. CED exchange was performed between 2 and 4 days from surgery in all patients. Infections were found in 5 (1.7%) of the CED patients. Infections were defined as requiring either intervention or antibiotics during or within 30 days of completing therapy.
Conclusions: In patients treated at our institution, infection rates appear similar in patients whose brachytherapy catheter was inserted with or without the CED.

1758
Idiopathic Lobular Granulomatous Mastitis: An Institutional Experience
Hadi M Khan1, Corinne Stobaga-Stevenson2, Nancy Jost2, Therese Bocklage2, John C Russell3
1University of New Mexico School of Medicine - Department of Surgery, Albuquerque, NM 2University of New Mexico School of Medicine - Department of Pathology, Albuquerque, NM
Objective: Idiopathic lobular granulomatous mastitis (ILGM) is a rare inflammatory breast disease that on histopathological examination reveals noncaseating granulomas appearing to originate from breast lobules. The clinical presentation can mimic a breast abscess, cellulitis, or an inflammatory breast cancer. The etiology is unknown, but associations with breast feeding, hormonal contraception, and infections with nonpathogenic bacteria, such as Corynebacteria, have been described. A possible allergic or autoimmune response to breast secretions has also been postulated.
Methods: A retrospective chart analysis was performed of all female patients with benign inflammatory breast disease treated at a single institution from January 2000 to April 2009. Patients with ILGM were compared with non-ILGM patients for age, ethnicity, history of breast feeding, hormonal contraception, surgical interventions (incision and drainage, excision, mastectomy), medical therapy, and observations. Logistic regression model was applied between cases and controls. Institutional IRB approval was obtained for this study.
Results: One hundred twelve total patients were identified, with 18 patients having a pathological diagnosis of ILGM and 94 with other inflammatory breast lesions. ILGM was seen in younger patients as compared to non-ILGM (37.3 vs 45.1 years, p < 0.01). Nine of 18 ILGM patients (50%) were of American Indian ethnicity as compared to the 42 of 94 (44%) controls (p = 0.6). A history of lactation within the past 36 months was seen in 11/18 (61%) with ILGM, and 36/94 (38%) of non-ILGM patients (p < 0.0 8). Hormonal use, including OCPs, was seen in 9/18 (50%) patients with ILGM as compared to 41/94 (44%) non-ILGM patients (p = 0.7). Three of 18 patients (16%) with ILGM did not undergo any surgical intervention. Six of 18 (33%) of the ILGM patients underwent incision and drainage. Five of 18 (27%) patients underwent mastectomies, and 4/18 (22%) patients had wide local excisions. No association with cancer was seen in any of the patients, although follow-up was short (range, 0-9 months, mean of 4 months).
Conclusions: ILGM is a rare but debilitating inflammatory disease seen in younger women. Previously described risk factors were not confirmed by this study, although a trend toward breast feeding within 36 months of clinical presentation was seen. ILGM can lead to extensive surgical excision procedures, including mastectomies. A clinicopathologic analysis is presently underway to better elucidate potential causative factors.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Touch Imprint</th>
<th>IHC</th>
<th>Frozen</th>
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<tbody>
<tr>
<td>Sensitivity</td>
<td>77.77%</td>
<td>88.88%</td>
<td>96.29%</td>
</tr>
<tr>
<td>Specificity</td>
<td>100%</td>
<td>97.1%</td>
<td>100%</td>
</tr>
<tr>
<td>Positive predictive value</td>
<td>100%</td>
<td>96%</td>
<td>100%</td>
</tr>
<tr>
<td>Negative predictive value</td>
<td>85.36%</td>
<td>91.89%</td>
<td>97.22%</td>
</tr>
<tr>
<td>Accuracy</td>
<td>90.31%</td>
<td>93.54%</td>
<td>98.38%</td>
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</table>

Poster Presentations
Frozen Section Analysis of the SLN, Is It Worth It?

Heather King, James Evan Geisinger Medical Center, Danville, PA

Objective: Routine intraoperative pathological evaluation of the sentinel nodes is used at many institutions. A recent study published by McLoughlin et al from Memorial Sloan-Kettering Cancer Center in July 2007 concluded that among patients undergoing FSA of the SLN only 7% were spared a return trip to the operating room by performing a routine FSA on the SLN. There was a 48% relative risk reduction of a return to the operating room for a second procedure (53 patients for positive SLN, 19 patients for positive margins, and 8 patients for both).

Methods: This study is a retrospective chart review of 272 consecutive recent patients. The data were collected from the electronic medical records from 1/1/2007 to 1/1/2010. All patients who underwent an SLN for invasive or noninvasive breast cancer were included in the study. We excluded patients who underwent SLN prior to neoadjuvant systemic therapy. The following variables were collected on each patient: the type of definitive surgery as well as the indication for excision in 20 lesions (64.5%) and high-risk pathology in 6 lesions (19.4%). Despite the presence of a clear local recurrence, there was no significant difference in OS between IBC TN patients (n = 27) compared to LABC TN patients (p < 0.24) in this small subset analysis, a significant difference in MFS was noted with worse outcomes for IBC TN patients (p = 0.02).

Conclusions: Despite more aggressive treatment, patients diagnosed with IBC had significantly worse OS and MFS. IBC is associated with a trend toward greater TN disease with a poorer prognosis when compared to LABC.

Future studies are necessary to elucidate better treatment options and prognostic factors for IBC.

1683 Evaluation of a Collagen-Based Breast Biopsy Marker (HydroMARK®) as an Alternative to Wire and Radioactive Seed Localization for Nonpalpable Breast Lesions

Rebecca Hein, Julie Mook, David Euhus, Roshni Rao, Ralph Wynn, Marilyn Leitch UT Southwestern Medical Center, Dallas, TX

Objective: Surgical excision for nonpalpable breast lesions requires image-guided localization. Typically, localization involves placement of a wire or radioactive seed as an additional procedure prior to operation. In this study, we reviewed our initial experience with the use of a newly available collagen-based breast biopsy marker. The objective was to determine if the sonographically visible marker could be utilized independently as a localization method using intraoperative ultrasound rather than the currently used methods of wire and radioactive seed localization.

In a retrospective review of surgical excisions performed from November 1999 to October 2010, we identified patients who underwent image-guided needle biopsy which resulted in need for surgical excision. The HydroMARK® was placed at the time of image-guided biopsy. Twenty-five lesions were also preoperatively localized under radiologic guidance with either a wire (8) or radioactive seed (17). Our endpoints included intraoperative visualization of the marker, successful excision of the lesion, and presence of the marker on specimen radiograph.

Results: Thirty-one lesions in 25 patients had the collagen-based marker placed at time of procedure for image-guided needle biopsy. Thirty-six (93.6%) of the lesion markers were adequately visualized by intraoperative ultrasound performed by the surgeon. Intraoperative ultrasound imaging alone was successful for localization in 6 cases (19%). Intraoperative difficulties were encountered in 16 of 51 (51.6%) procedures. This included either extrusion of the marker when the biopsy tract was transected in 14 (45.2%) cases or migration of the marker prior to the procedure in 2 (6.4%) cases. The marker was visualized on specimen radiograph in 15 (48.4%) cases. This low rate was attributed to extrusion. The marker itself was retrieved in all procedures. We examined the association between extrusion of the marker and method of localization, length of time between placement and excision, size of lesion, and whether a skin ellipse was taken or not. Use of localization, specifically a wire and a radioactive seed, was the only factor that showed a significant association with marker extrusion. This finding was felt to be secondary to a relatively smaller volume of tissue excised in lesions with marker extrusion. It is possible that the marker was not fully retrieved. In addition, negative margins were achieved in 100% of the excisions for malignant lesions.

Conclusions: Use of a localization marker that is placed at the time of initial core biopsy would obviate the expense and inconvenience associated with a separate localization procedure. While intraoperative sonographic visualization of the collagen-based marker was seen in our initial experiences, a large number of our excisions required extrusion of the marker. Further adjustments are needed in order for this marker to be utilized independently of preoperative wire or seed localization. Recommendations for modifications of this technique should include a reduction of the exposure to the patient of the marker or coating that would promote better tissue adherence.
1715
Sociocultural and Racial Differences in Hospital Utilization in Breast Cancer Patients
Amanda L Kong, Tina WF Yen, Liliana E Pezzin, Hainan Miao, Rodney A Sparapani, Purushottam W Laud, Ann B Nattinger
Medical College of Wisconsin, Milwaukee, WI
Objective: Population-based studies have revealed decreased mortality and superior outcomes in hospitals that treat higher volumes of breast cancer patients. Studies have also found disparities in breast cancer survival, with non-white and lower socioeconomic status (SES) patients having worse outcomes. The purpose of our study was to determine whether non-white or low SES patients are disproportionately treated in low-volume hospitals.
Methods: A population-based cohort of Medicare breast cancer patients who underwent breast cancer surgery in 2003 participated in a survey study examining breast cancer outcomes. Demographic, socioeconomic, and tumor stage information was obtained from survey responses, Medicare claims, and state tumor registry data. Hospital volume was categorized based on terciles at the patient level. The low-volume group (defined as hospitals performing 20 breast cancer procedures a year or less) was compared to the higher volume group (the remaining hospitals).
Results: Of 2,435 women, 864 (35%) were treated at 366 low-volume hospitals and 1,571 were treated at 176 higher volume hospitals. On univariate analysis, patients treated at low-volume hospitals were less likely to be white (p = 0.005), had lower ZIP code per capita incomes (p < 0.0001), were more likely to have Medicaid (p = 0.006), less likely to have another source of insurance coverage (p = 0.004), and were also less likely to report a higher degree of available emotional/informational support (p = 0.021). Low-volume hospitals were more likely to treat patients with missing stage of disease information (p = 0.002). Age, co-morbidity index, marital status, and tangible support scale were unrelated to hospital volume. On multivariate analysis, the independent predictors of patients treated at a low-volume hospital being black (p = 0.018), having a lower ZIP code per capita income (p = 0.0001), and having an unknown disease stage (p = 0.003) (Table).
Conclusions: In this large, population-based Medicare cohort, black women, poorer women, and those without full staging were more likely to be treated at low-volume hospitals for their breast cancer. These differences may explain some of the racial and SES disparities in breast cancer outcomes. Future studies should examine the influence of treatment variables in addition to patient variables to further explore the hospital volume-outcome relationship.

1762
Variations in Postmastectomy Reconstruction Rates: Invasive and In Situ Carcinoma
Laura Kruper, Xin-Xin Xu, Leslie Bernstein, Katherrin D Henderson
City of Hope, Duarte, CA
Objective: Many factors influence whether breast cancer patients undergo reconstruction after mastectomy for both in situ and invasive cancer. This study was undertaken to determine the patterns of care and variables associated with the use of reconstruction at hospitals in four counties within Southern California: Los Angeles, Orange, San Bernardino, and Riverside.
Methods: Postmastectomy reconstruction rates were determined from the California Office of Statewide Health Planning and Development (OSHPD) inpatient database over a 6-year timespan from 2003-2008. International Classification of Disease-9 codes were used to identify female breast cancer patients with a diagnosis of ductal carcinoma in situ (DCIS) (233.0) or invasive breast cancer (174.6-174.9) who underwent mastectomy only or mastectomy with reconstruction. Variations in reconstruction rates were examined by type of breast cancer (DCIS vs invasive), calendar year, age, type of insurance, type of hospital (comprehensive cancer center, teaching hospital, other) and race of patient (white, African-American, Asian or other). Multivariable logistic regression was used to calculate odds ratios (OR) and 95% confidence intervals (CI).
Results: A higher proportion of DCIS patients underwent immediate reconstruction following mastectomy as compared to patients with invasive breast cancer. For the years 2003 through 2008, the proportion of patients undergoing immediate reconstruction after mastectomy for DCIS ranged from 40.0 to 53.1% as opposed to 21.1 to 28.1% for invasive carcinoma. For both DCIS and invasive breast cancer, the likelihood of any reconstruction increased with later calendar year (p trendDCIS = 0.004, p trendinv < 0.001). Likewise, for both diagnoses women under the age of 40 consistently had the highest proportion of immediate reconstruction rates compared to other age groups. Women with invasive breast cancer between 40 and 59 years of age (OR, 0.66; 95% CI, 0.58-0.76) was less likely to undergo immediate reconstruction vs women less than 40 years of age (OR, 0.66; 95% CI, 0.58-0.76). DCIS and invasive breast cancer patients with private insurance were three times more likely to undergo immediate reconstruction compared to patients with Medicare (ORDCIS, 3.50; 95% CI, 2.76-4.42; ORinv, 3.31; 95% CI, 3.00-3.65). Teaching hospitals were roughly twice as likely to perform immediate reconstruction when compared to non-teaching hospitals, for either diagnosis (ORDCIS, 1.69; 95% CI, 1.26-2.24; ORinv, 2.49; 95% CI, 2.27-2.73). African-American patients with invasive breast cancer were half as likely to undergo immediate reconstruction compared to whites (OR, 0.53; 95% CI, 0.44-0.64). No statistically significant difference in likelihood of immediate reconstruction was apparent between these two race groups for DCIS. Asian patients were approximately 70% less likely to undergo immediate reconstruction, compared to white patients, for both DCIS and invasive disease (ORDCIS, 0.27; 95% CI, 0.16-0.44; ORinv 0.35, 95% CI, 0.28-0.42).
Conclusions: There are several factors associated with postmastectomy reconstruction rates which vary according to diagnosis: DCIS versus invasive carcinoma. The proportion of patients undergoing immediate reconstruction after mastectomy for DCIS as a twice that of invasive breast cancer. Insurance status, age, type of hospital, and race appear to be significant factors limiting the use of reconstruction for both DCIS and invasive carcinoma.

2170
Survival After Mastectomy: Duration to Ipsilateral Breast Tumor Recurrence (IBTR) Affect the Success or Failure of Reoperative Sentinel Lymph Node Biopsy?
Nafisa Kuwajerwala, Christine Widders, Lucia Victoria, Judy Bora, John Seitz
William Beaumont Hospital, MI
Objective: Five to ten percent of patients with prior breast cancer treated with BCT will develop IBTR, requiring a reoperative SLNB. Several patients will then present with history of prior axillary surgery, which could be an ALND or SLNB. Prior number of LN removed has been reported for success of reoperative SLNB, but duration to IBTR has not been studied.
Methods: We did a 3-year retrospective review of 28 patients and categorized as Prior ALND (<10 lymph nodes, N = 14), PriorSLNB (<10 LN removed, N = 10) and Unknown number of LN removed (N = 4). We also evaluated duration (<10 yrs [N = 13] vs >10 yrs [N = 10]) to IBTR in 23 of the 28 patients toward success or failure of re operative SLNB.
Results: Reoperative SLNB was successful in 17 of 28 (60.71%) patients. In patients with prior ALND and SLNB, the success rate was 5/14 (36%) and 7/10 (70%), respectively (p = 0.098). Unknown group, success was 3 of 4 (75%) and was not included in the statistics above. Regarding duration to recurrence known in 23 of the 28 patients, reoperative SLNB was successful in 7/13 (54%) and 6/10 (60%) patients with duration to IBTR <10 yrs and >10 yrs, respectively (p = 1.0).
Conclusions: Reoperative SLNB is successful in 61% of our patients. Neither duration to IBTR nor prior number of lymph nodes removed influenced the success of the reoperative SLNB in our study. Lack of significance in these findings may be related to small sample size. Large, randomized controlled trials are needed to further assess the success rate of reoperative SLNB.

2733
Sentinel Lymph Node Biopsy in Prophylactic Mastectomy—Are We Overtreating? Experience at a Community Hospital
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Objective: The routine use of sentinel lymph node biopsy (SLNB) at the time of prophylactic mastectomy is controversial. This retrospective study was undertaken to determine the use of SLNB at the time of contralateral prophylactic mastectomy (CPM) at a community hospital.
Methods: Between 2007 and 2009, 170 patients underwent CPM at a suburban, tertiary care facility. The CPM was either immediate, delayed, or for recurrent breast cancer. Thirty-seven (21.8%) patients had SLNB performed at the time of CPM. The specimens underwent standard pathologic evaluation. The SLN was evaluated intraoperatively with touch prep cytology and postoperatively with H&E and immunohistochemistry.
Results: Thirty-seven (21.8%) had SLNB and none were positive on touch prep or final H&E (0.37% = 0%). Fourteen patients (8.2%) had additional nodes identified in the specimen. These were either axillary tail nodes or intrammary nodes (non-SLN). The median number of SLN removed was 2 (range, 1-5), none of these were positive. There were three incidental cancers diagnosed on final pathology. Two were invasive and one was DCIS. SLNB was only performed on the patient with DCIS. The invasive cancers were T1a and grade 1 and did not have SLNB. A subsequent ALND was not performed in these invasive cancers. Only 3 of 170 (1.76%) patients undergoing CPM had findings on final pathology that would have justified the axillary staging. This correlates with other published data regarding SLNB in CPM.
Conclusions: Currently SLNB is performed in 21.8% of patients undergoing CPM in a community hospital. In this retrospective study, SLNB in CPM would have added staging information in only 1.76% of the patients. Guidelines for SLNB in prophylactic mastectomy need to be established in order to avoid overtreatment.
1728 Breast Cancer in Southern Chinese: A Population Study by The Hong Kong Cancer Registry

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Objective: Breast cancer is the most common cancer in women in Hong Kong. The incidence is 1.8% in 2015 and is increasing. For reasons still unclear, this increase is more noticeable in the younger age group. It has been suggested that the more Westernized lifestyle may play a part to contribute to this increase. Understanding the epidemiological characteristics, disease pattern, treatment and its outcome of breast cancer patients in Chinese residing in Asia, based on population-based data will be useful to provide a baseline study cohort for comparative studies that of Asian Chinese in the West. This is the first comprehensive population-based breast cancer study performed using the national database of the Hong Kong Cancer Registry.

Methods: A retrospective review of medical records of subjects who are diagnosed with breast cancer between January 1, 1997, and December 31, 2001, was performed. All cases would be followed up to December 31, 2007, by matching with the Hong Kong Cancer Registry’s database, death register, and Hospital Authority’s data warehouse. Information to be obtained includes risk factors related to breast cancer, clinical management information, histological information of the breast cancer, date of diagnosis of breast cancer, last date seen and status last seen, and, if death, cause of death. Multivariate comparison variables and find any association or difference among variables. Crude survival probabilities, such as overall survival, disease-free survival and disease-specific survival, will be calculated using the life table Kaplan-Meier method.

Results: A total of 8,156 breast cancer patients’ medical records and dataset were available during this period. Seven thousand six hundred thirty (94%) had invasive cancers and 526 (6%) were DCIS. Of the invasive cancers, 48% of our cohort were diagnosed with breast cancer aged 49 years and below. The mean age of diagnosis was 55.3 and median age 52 years old. Eighty-one percent had invasive ductal carcinomas and 3% invasive lobular carcinomas. Of those known, 39.20%, 45.3%, and 15.6% had grade I, II, III cancer, respectively; 25.4%, 26.8%, had stage 4, 3, 2, and 1 cancer, respectively; 61% had ER positive cancer; 44% had HER2 positive cancers; 13.3% of our cohort had triple-negative cancers; 55.8% had chemotherapy; 59% radiation therapy, and 96% of those who had an ER cancer took tamoxifen. The 5-year overall survival, relative survival, and cause-specific survival were 79.6%, 84%, and 85.2%, respectively. Compared with SEER database, the 5-year survival relative survival of 87.1% was similar to our cohort.

Conclusions: Cancer registries have been set up worldwide to provide information on cancers, such as breast cancer. This information has been published in many Western countries but is much lacking in Asia. We performed a first comprehensive population-based breast cancer epidemiology study in Southern China using the Hong Kong Cancer Registry database.

1651 Neoadjuvant Breast Cancer Patient

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Objective: With the growing use of preoperative magnetic resonance imaging (MRI), identification of abnormal-appearing interpectoral or Rotter’s nodes has increased. We describe the procedure of identifying and surgically removing metastatic Rotter’s nodes in the post-neoadjuvant breast cancer patient at the time of definitive surgery.

Methods: This is a retrospective review of 215 breast cancer patients who received preoperative MRI at our institution between June 2008 and December 2009. Patients with suspicious Rotter’s nodes on MRI underwent ultrasound (US) guided needle biopsy of these suspicious nodes confirming metastatic disease. Percutaneous metallic clips were placed into the node at the time of biopsy. After neoadjuvant chemotherapy, all patients had CT-guided wire localization of the clipped Rotter’s node perioperatively. Intraoperatively, wire-localized Rotter’s nodes were identified, resected, and sent separately for pathological evaluation.

Results: Of 215 patients, 4 had a single abnormal Rotter’s node identified on a pre-chemotherapy MRI and successfully underwent a diagnostic US-guided percutaneous biopsy. Mean Rotter’s node size on MRI was 1.5 cm (range, 1.2-2.3 cm); mean US size was 1.8 cm (range, 1.2-2.4 cm). Mean tumor size on MRI was 6.3 cm (range, 3.8-10.8 cm); three patients (7%) had evidence of pectoralis muscle involvement on MRI. All four patients had a modified radical mastectomy concurrent with wire localization of the interpectoral clip. Three patients had the wire-localized specimen taken separately. All patients had residual disease in both Rotter’s and axillary nodes on pathological evaluation. Mean number of Rotter’s nodes removed was 1.5 cm (range, 1-2); mean node size was 0.8 cm (range, 0.1-1.5). Mean number of axillary nodes removed was 12.6 (range, 7-24); mean number of positive axillary nodes was 3.3 (range, 1-7). All four patients received postmastectomy radiation. There were no surgical complications.

Conclusions: Preoperative diagnosis of Rotter’s node involvement is technically feasible and facilitates resection with no additional morbidity. The clinical impact of interpectoral nodal disease merits further study.

1641 Melanocyte Migration Can Result in Natural Pigmentation of Native Flap Nipple Reconstructions After Areola-Sparing Mammectomy

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Objective: Demonstration of spontaneous increased pigmentation in reconstructed nipples derived from native TRAM and latissimus flap tissue has been noted after utilizing areola-sparing mammectomy. This can result in an incredibly natural appearance of the reconstructed nipple and make intra­dermal tattooing unnecessary. Pathological examination of these nipples, native areola, and reconstructed nipple that had undergone self-darkening was undertaken to attempt to account for the spontaneous color change of the tissue.

Methods: Punch biopsy samples from pre- and post-operative dermis were analyzed for qualitative pigment changes as well as quantitative increase in number of melanocytes. H&E staining provided qualitative measurement of pigment granules in the newly created nipple, compared with the native donor site. MART-1 antibody stains allowed for quantitative melanocyte count comparison between the dermis of the reconstructed nipple, the adjacent spared areola tissue, and the original donor site as well.

Results: Dermatopathologic analysis showed an increase in pigmentation of the reconstructed nipple that was comparable to that of the adjacent areola tissue and much darker than its tissue of origin, dermis from the patients’ back skin if latisimus dorsi was utilized, or abdominal skin if a TRAM flap served as a harvest site. The number of melanocytes was also significantly increased: 8 to 10 melanocytes per linear millimeter noted in the donor dermis, versus 50 to 60 melanocytes noted in areola dermis and the reconstructed nipple dermis postoperatively.

Conclusions: Evidence that color matching to the surrounding areola was due to melanocyte migration was demonstrated with pathological evaluation of donor dermis, areolar tissue, and the reconstructed nipple tissue that had increased pigmentation postoperatively. This is most dramatic in individuals with darker pigmentation in general and resulted in improved color match and negated the need for additional tattooing to improve the color match between the newly created nipple and the native areola.

1739 Palpable Breast Cancer in Screened Patients: A Sign of Aggressive Disease

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Objective: The United States Preventive Services Task Force (USPSTF) recently updated their recommendations regarding mammogram screening. Due to the subsequent controversy, we reviewed the presentation of all newly diagnosed breast cancer and ductal carcinoma in situ (DCIS) at our institution.

Methods: A retrospective review was performed from 2005-2009 with patients categorized according to age at diagnosis. Tumors were defined as screen-detected based on USPSTF criteria (40-49, 50-75 yrs). The presentation characteristics evaluated include mammogram (mammo) detected versus palpable by self breast exam (SHE) or clinical breast exam (CBE) and time from mammogram to diagnosis.

Results: A total of 782 patients were identified. Patients <50 yrs had a greater likelihood of presenting with palpable disease compared to patients >50 yrs (< 0.0001) with 75% of all patients having had a mammogram within 24 months (see Table). When analyzing patients diagnosed by screening mammography, there were few differences in tumor characteristics between those patients who had a mammogram <12 months (n = 118) vs >12-24 months (n = 261). Patients with a mammogram <12 months had a higher incidence of Tis tumors (16% vs 9%) and lower incidence of T1 tumors (67% vs 81%), but no difference in T2 or T3 tumor incidence (p = 0.009). Other tumor characteristics were comparable between these two groups, including mean tumor size, tumor markers, and lymph node (LN) status. A similar analysis was performed between patients who presented by SBE/CBE and a mammogram <12 months (n = 143) vs >12-24 months (n = 66), which did not reveal any difference in tumor characteristics between the groups. Screened patients were then compared by presentation: mammogram <12 months (n = 379, 64%) vs 12-24 months (n = 240, 36%). Patients who presented by SBE/CBE had larger mean tumor size (2.4 vs 1.3 cm), p < 0.0001; higher T stage, p < 0.0001; higher grade, p < 0.0001; more ER- markers (29% vs 16%) and PR- markers (3% vs 10%); 0.0001; and positivity (39% vs 17%), p < 0.0001. There was, however, no difference between the groups Her2 status. Lastly, tumor characteristics of patients who had analog (n = 881) vs digital (n = 149) mammography were compared. There was no difference in mean tumor size, T stage, or tumor markers was detected.

Conclusions: Three quarters of our breast cancer patients had undergone a mammogram within 24 months. Even though the majority of patients presented with image-detected breast cancer, there is still a high percentage of patients who develop palpable disease. Those with palpable disease appear to be younger and present with more aggressive tumor characteristics. Until better imaging techniques are developed, SBE and CBE play an important role in breast cancer diagnosis.
Conclusions:

Results: Core needle biopsy specimens were analyzed for 108 patients with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/31/2010 were chosen from a multicenter, IRB-approved study, tissue, blood, and data banking project. Core needle biopsy was performed and pathological analysis included tumor type and grade, and ER, PR, HER2, and CK7 status by IHC. Definitive surgical resection of the tumor and lymph nodes, the specimens were examined by site pathology and sections sent to central pathology for independent analysis (pathology and IHC). A breast-only control pathology team supervised the project and ensured strict adherence to protocol, which included timed specimen removal, placement on ice to minimize anoxic tissue time, and standardized tissue processing. SAS Inc's JMP software was used to analyze the data. The inter-rater agreement statistic K was 0.44 (95% CI 0.18, 0.71).

**Table 1:** ER expression of core biopsy vs. surgical resection specimens. The inter-rater agreement statistic K = 0.44 (95% CI 0.18, 0.71).

Poster Presentations
Poster Presentations

1653

Reasons for Mastectomy After Neoadjuvant Chemotherapy
Carolinas Medical Center, Charlotte, NC

Objective: Neoadjuvant chemotherapy for breast cancer has been found to downstage tumors to allow patients to be candidates for breast-conserving therapy. Previous experience at our institution has shown a 67% breast conservation rate after neoadjuvant chemotherapy and pretreatment tumor size of 4.5 cm. The goal of this study is to determine the reasons for mastectomy after neoadjuvant chemotherapy.

Methods: A retrospective review at a single institution of patients who underwent neoadjuvant chemotherapy followed by surgical treatment was performed. Patients presenting with multifocal/multicentric tumors, male patients, and recurrences were excluded. Tumor characteristics, chemotherapy regimens, and operative treatments including re-excisions and nodal evaluation were collected. Comparisons were made between patients who underwent breast conservation surgery and mastectomy. Reasons for mastectomy were assessed by chart review. Statistical analysis with t-test and chi-square was performed.

Results: From February 2006 to August 2010, 149 patients underwent neoadjuvant chemotherapy followed by surgical procedure: 104 breast conservation (69%) and 47 mastectomy (31%). Two patients underwent bilateral mastectomies for bilateral cancer. There was no difference in age between the two groups. Tumor characteristics are shown in Table 1. Reasons for mastectomy are patient preference (42%), extent of disease based on clinical and surgical assessment (25%), BRCA positivity (19%), persistent sinus tract (2%), and wound complication related to persistent sinus tract (2%).

Conclusions: Besides patient preference, the majority of reasons for undergoing mastectomy after neoadjuvant chemotherapy are related to tumor characteristics or BRCA status. In addition, larger preoperative tumor size may influence patient’s decision to pursue mastectomy.

Table 1. Tumor characteristics

<table>
<thead>
<tr>
<th>Tumor characteristics</th>
<th>Mastectomy</th>
<th>IDC</th>
<th>ILC</th>
<th>DCIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical T grade</td>
<td>0.063</td>
<td>0.27</td>
<td>0.52</td>
<td>0.85</td>
</tr>
<tr>
<td>Pathologic T grade</td>
<td>0.0001</td>
<td>0.0001</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

*p < 0.05

1691

Impact of MRI on the Management of Breast Cancer
Carolinas Medical Center, Charlotte, NC

Objective: Magnetic resonance imaging (MRI) is commonly used to evaluate breast cancer, often in an effort to define extent of disease and assess the contralateral breast. Additional biopsies and imaging studies are often performed. The goal of this study is to review the impact of MRI on clinical management after a diagnosis of breast cancer.

Methods: Retrospective review of patients diagnosed with breast cancer at a single institution. Patients were categorized according to whether or not MRI was performed during evaluation. Comparisons were made between the two groups, regarding patient demographic characteristics, and operative information. Information regarding second-look ultrasounds and additional biopsies were collected for the MRI group. Statistical analysis included t-test, chi-square test, and multiple logistic regression model.

Results: From November 2007 to June 2010, 386 eligible patients diagnosed with breast cancer were evaluated and treated. MRI was performed on 220 patients (57%). There was no difference in race or ethnicity, but patients who underwent MRI were on average younger (52 years vs 62 years, p < 0.0001). Tumor and treatment characteristics of the two groups are shown in Table 1. Patients who underwent neoadjuvant chemotherapy were more likely to have an MRI performed (87% vs 49%, p < 0.0001). In the MRI group, 80% of patients had a single MRI performed, and 97% were performed preoperatively. Of patients who underwent MRI, 61 patients underwent second MRI after lumpectomy and 52% had additional biopsies performed on 53 (24%) patients. Sites of MRI-generated biopsy include additional sites in ipsilateral breast (n = 40), primary site (n = 2), axilla (n = 8), and contralateral breast (n = 3). Malignancy was found in 14 ipsilateral breast (35%), 7 axillary (18%), and 5 of the contralateral breast biopsies. On multivariate analysis, MRI was found to be an independent predictor of undergoing mastectomy (odds ratio, 2.842, confidence interval, 1.634 to 4.943, p = 0.0002).

Conclusions: Breast MRI is frequently utilized in younger patients with higher clinical stage and undergoing neoadjuvant chemotherapy. Those patients who undergo MRI are more likely to be treated with mastectomy.

Table 1: Tumor and treatment characteristics

<table>
<thead>
<tr>
<th>n</th>
<th>Clinical Stage 2 or Higher</th>
<th>Mastectomy</th>
<th>IDC</th>
<th>ILC</th>
<th>DCIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI</td>
<td>220</td>
<td>44%</td>
<td>36%</td>
<td>79%</td>
<td>10%</td>
</tr>
<tr>
<td>Non-MRI</td>
<td>166</td>
<td>37%</td>
<td>16%</td>
<td>75%</td>
<td>8%</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0001</td>
<td>0.0001</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
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</tbody>
</table>

1731

Cost-Effectiveness Analysis of Routine Frozen-Section Analysis of Breast Margins Compared With Resection for Positive Margins
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Objective: Negative margins are associated with decreased local recurrence after lumpectomy for breast cancer. A second operation for re-excision of positive margins after lumpectomy is required to achieve negative margins, with rates varying from 15-50%. At our institution we routinely use frozen-section analysis of all margins to minimize need for a second operation. Positive and close margins identified intraoperatively are re-excised at the initial operation, resulting in longer operating time; however, avoiding a second operative procedure. The aim of this study was to evaluate the cost benefit of routine frozen-section analysis to avoid reoperation for positive margins.

Methods: A decision tree was built to compare two strategies: (A) lumpectomy without frozen section and a second operation for positive margin(s) versus (B) lumpectomy with intraoperative frozen-section analysis. The rate of re-operation was varied with modeling to determine when the use of frozen section became cost saving over a second operation for margin re-excision. Costs included in the model were: operating room, anesthesia, surgical team, frozen and permanent section analysis. Operating room times were defined as duration between patient entering and exiting the room. The costs to our institution to provide the service (cost to provider) associated with these strategies were compared, as well as Medicare reimbursement data (cost to payor). For strategy A, we used an operating room time of 90 minutes for lumpectomy. The rate of positive margin re-operation ranged from 15% to 50% in increments of five percentage points. For strategy B, we used an operating room time of 125 minutes for cases with initial negative margins and 145 minutes for cases with initial positive margins and a second operation rate of 1%. Review of institutional experience has shown an intraoperative re-excision of at least one margin in 45% of cases.

Results: The cost to provider per patient resected to negative margins for strategy A ranged from $3,855 (15% reoperation rate) to $4,665 (50% reoperation rate). For strategy B the cost for cases with initial negative margins was $5,128 and for cases with initial positive margins was $5,951. Average weighted cost of strategy B was $5,523. Varying the rate of second operation in strategy A, analysis showed that strategy B was cheaper than strategy A when the reoperation rate was above 30%. The cost to pay for strategy A ranged from $3,110 (15% reoperation rate) to $4,665 (50% reoperation rate). For strategy B, the cost for cases with initial negative margins was $3,530 and for cases with initial positive margins was $4,186. Average weighted cost for Strategy B was $3,855. Use of frozen section was cheaper in all instances where the re-excision rate was greater than 25%.

Conclusions: Routine use of frozen-section analysis of lumpectomy margins decreases reoperation rates for margin control. Looking at cost to provider, frozen section is cost-effective when the margin re-excision rate is greater than 38% and for Medicare reimbursement, frozen section is cost-effective when margin re-excision rate is greater than 25%.

1698

Factors Associated With Malignancy on Ultrasound-Guided Axillary Core Needle Biopsy
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Objective: Breast density is a key factor in the surgical and medical management of breast cancer. Evaluation of the axilla by sentinel lymph node biopsy has become standard of care in clinically node-negative patients. Although sentinel lymph node biopsy is less invasive than axillary lymph node biopsy, surgical evaluation of lymph nodes is not without morbidity. Axillary ultrasound-directed percutaneous needle biopsy has been recently used and validated as a potentially valuable technique for identifying axillary metastasis. We sought to evaluate clinical and sonographic factors associated with malignant pathology obtained by axillary ultrasound-guided core needle biopsy.

Methods: A retrospective review was performed of sequential patients referred for axillary ultrasound-guided core needle biopsy between 2006 and 2010 at a single institution. Malignant and benign core needle biopsy results were compared by clinical and sonographic characteristics, including patient age, lymph node size, BI-RADS score, breast pathology, identification of biopsy (axillary tail vs axilla), clinically suspicious lymphadenopathy, focal cortical thickening, irregular borders, solid mass lesion, vascularity, absence of a fatty hilum, and nodule size.

Results: During the study period, 95 axillary ultrasound-guided core needle biopsies performed, 50 (52.6%) were malignant and 45 (47.4%) were benign. The average patient age was 54.4 (range, 22-89). One third (33.7%) of patients had a known breast malignancy prior to axillary biopsy. Clinically suspicious lymphadenopathy was noted in 60.0% of patients. Average lymph node size was 22.5 mm (range, 9.54). Malignancy pathologic on axillary ultrasound-guided core needle biopsy was significantly associated with clinical suspicion (p = 0.01), patient age (p = 0.007), lymph node size (p = 0.02), BI-RADS score (p < 0.001), irregular borders (p = 0.02), echogenicity (p < 0.05), and breast pathology (p < 0.001). No association was found with biopsy year, site of biopsy (axillary tail vs axilla), known breast cancer diagnosis, focal cortical thickening, solid mass lesion, vascularity, or absence of a fatty hilum.

Conclusions: Malignant findings on axillary ultrasound-guided core needle biopsy are associated with the readily available clinical characteristics of suspicious adenopathy, patient breast pathology, and BI-RADS score, as well as sonographic factors of lymph node size, irregular borders, and echogenicity. Surgeons performing ultrasound-guided axillary core needle biopsies can easily interpret these findings to offer appropriate pre-procedure patient counseling.
1654
Outcome in Augmented Patients Who Subsequently Develop Breast Cancer
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Objective: It is commonly thought that augmentation mammoplasty interferes with our ability to diagnose breast cancer and that augmented women therefore have a worse prognosis should they develop breast cancer. We have reviewed our series of patients with breast cancer to determine whether the augmented patients presented with more advanced disease and therefore had a poorer prognosis.

Methods: A prospective breast cancer database was reviewed. Augmented patients were compared to nonaugmented patients by numerous factors, including but not limited to palpability, tumor size, nuclear grade, percent in situ, nodal positivity, lymphovascular invasion, and breast cancer specific survival (BCSS).

Results: Four thousand eight hundred ten nonaugmented women and 195 women who had previously undergone augmentation mammoplasty were treated for breast cancer. Prebiopsy mammography was performed in 121 of 132 augmented patients with palpable lesions to reveal an abnormality in 43, a false-negative rate of 36%. The table compares important tumor characteristics between the two groups. In addition, there was no significant difference in tumor size, nuclear grade, recurrence-free, and overall survival between the two groups.

Conclusions: The false-negative mammography rate is higher in augmented women than reported in the general population (15%). This is probably due to lower quality mammography secondary to the implant. MRI is an important tool for this subgroup of patients. Augmented patients were more likely to have palpable and, therefore, node-positive cancers. In spite of this, distant recurrence, breast cancer specific survival, and overall survival in augmented women were not statistically different from the nonaugmented population.

1669
Palpability: A Poor Prognostic Finding in Patients With Invasive Breast Cancer
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Objective: Axillary lymph node status continues to be the single most important prognostic variable regarding breast cancer survival. A combination of tumor size and tumor palpability can be used to predict patients with a low probability of nodal positivity.

Methods: From 1979 through mid 2010, data from patients who underwent axillary intervention were concurrently entered in a prospective database.

Results: Three thousand seven hundred thirteen axillary node or sentinel node dissections were performed. Nodal positivity was analyzed by T category and whether the abnormality was a statistically significant increase in node-positivity when palpable T1a, T1b, T1c, T2, and T3 cancers were compared to nonpalpable cancers of similar size. Risk of node-positivity was greater in palpable than nonpalpable T1c cancers (p = 0.008). There was a highly significant survival advantage when breast cancers were found in subclinical vs clinical presentations.

Conclusions: Palpability was a poor prognostic sign for all T categories other than Tis. There was a statistically significant increase in node-positivity when palpable Tla, Tlb, Tlc, T2, and T3 cancers were compared with nonpalpable cancers of similar size. Risk of node-positivity was greater in palpable than nonpalpable T1c cancers.

1676
Timing of Bilateral Metachronous Breast Cancer
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Objective: Some studies have suggested that bilateral breast cancer can occur in up to 20% of patients. Studies have looked at types of cancer, age of women, ER/PR and her2-neu status, however, no studies to date have looked at the timing of secondary presentation. We performed a chart review of bilateral breast cancer patients to determine the timing of the second primary tumor.

Methods: A retrospective chart review of all patients in the University Medical Center tumor registry diagnosed with breast cancer from the years 1995-2008 was performed. These charts were then reviewed to find those patients who were diagnosed as having bilateral disease. One thousand two hundred fifteen total cases of breast cancer were identified during this time period. These patients were then analyzed to determine timing of the contralateral presentation.

Results: A total of 1,215 cases of breast cancer were diagnosed between the years of 1995-2008. Of these patients, 61 cases (5%) were found to have a previous diagnosis of breast cancer or a bilateral synchronous presentation. In this study, synchronous presentation was defined as a contralateral breast cancer within 3 months from the initial diagnosis. Twenty-two cases (1.8%) presented with bilateral synchronous cancer and were excluded from the study. Thirty-nine cases were identified to be bilateral metachronous breast cancer patients (3.2%). These cases were then analyzed to determine the timing of the contralateral breast cancer presentation. Three time periods were chosen: less than 2 years, between 2 and 5 years, and more than 5 years. Eleven cases (28.2%) were found to present within the first 2 years of the initial diagnosis. Five cases (12.8%) presented between 2-5 years. Twenty-three cases (59%) presented after 5 years of the initial diagnosis.

Conclusions: This study suggests there is a bimodal distribution for the timing in presentation of metachronous breast cancer. If bilateral synchronous breast cancer patients had been included, the bimodal distribution would have been more pronounced. This raises questions about the biologic behavior of the tumors occurring less than 2 years and those occurring after 5 years of the initial diagnosis. Also, overall surveillance of breast cancer may be affected, with closer observation needed within the first 2 years and after 5 years.
Poster Presentations

1640
The Goldilocks Mastectomy: Our Experience in Utilization of Redundant Mastectomy
Flap Tissue Only for Reconstruction in Women With Macromastia
Heather Richardson, Grace Ma
Piedmont Hospital, Atlanta, GA

Objective: To reconstruct a breast mound from cutaneous mastectomy flap tissue alone, obviating the need for additional flap or implant techniques.

Methods: In large-breasted patients who decline traditional methods of breast reconstruction, we have preserved and de-epithelialized residual mastectomy flap tissue for placement under a standard Wise incision pattern. This has allowed the patient to have a complete and oncologically sound mastectomy with preservation of fullness, if not a re-creation of their original breast mound.

Results: Over an 18-month period, five women (seven breasts) with macromastia underwent mastectomy using this technique. All women have been very pleased with the overall cosmesis and have had no long-term complications, local recurrence, or problematic wound healing thus far. Focal areas of fat necrosis have been noted but have not been symptomatic or required any intervention.

Conclusions: We have observed a growing trend of patients with larger, more ptotic breasts. Some of these patients decline traditional methods of breast reconstruction altogether because they do not want additional surgery. Our method of “minimal reconstruction” provides several advantages over simple mastectomy without reconstruction. If the patient still requires prosthesis, the tissue mound helps prevent malposition of the prosthesis.

The procedure is performed in a single stage and does not require specialized closure by a reconstructive surgeon, although a team approach can improve overall aesthetics. It is cost effective and does not require implanted devices. Disadvantages include limited range of application as it applies to larger breasted patients whose upper pole must overlap the inframammary fold. It also creates asymmetry if the contralateral breast is left untouched. We have dubbed it the “Goldilocks" mastectomy because it allows the patient to have a more cosmetically pleasing reconstruction simple mastectomy alone without additional effort, time, or cost associated with formal reconstruction.

1677
Jessica Ryan, Justin Lee
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Objective: Risk factors for breast and uterine cancer have been well recognized in the literature. The purpose of this study was to analyze national trends in concurrent diagnoses of breast and uterine cancer from 2000 to 2008.

Methods: A retrospective analysis of the Nationwide Inpatient Sample (NIS) from 2000 to 2008 was performed. ICD9 codes were used to identify diagnoses, race, primary payer, and median income category. Using a coding algorithm, national trends were calculated. P values of <0.05 were considered statistically significant.

Results: During the study period, an estimated 28,925 inpatient discharges with concurrent breast and uterine cancer were identified. From 2000 to 2008, concurrent diagnoses increased 59.3%, from 2,472 to 3,937. Patients had a mean age of 69.5 years and the majority of patients were white (63.6%), with a significant number of blacks (6.7%) and Hispanics (3.3%). Primary payers were mostly Medicare (62.1%) and private, including HMO (31.9%). No significant changes in race and primary payer groups occurred during the study period. The distribution of patients from all four income brackets shows that the most significant increase occurred in the lowest median income group, from 85 to 669, or 3.5% to 17.0% (p = 0.0001).

Conclusions: National trends indicate a rise in concurrent diagnoses of uterine and breast cancer. The lowest median income group experienced the most significant increase in concurrent diagnoses. Proportions of racial and primary payer groups remained stable during the study period. Further studies are needed to analyze access, screening, and awareness in the lowest income group.

1726
The Relationship Between ABO Blood Type/ Ethnicity and Breast Cancer
Yara V Robertson, V Suzanne Klimberg
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Objective: African American (AA) women have a lower rate of breast cancer diagnosis than Caucasian women in the United States, yet their mortality is higher than any other race or ethnic group. Even when poverty, access to healthcare, educational disparity, and socioeconomic status are accounted for, AA women have a worse overall survival. AA women have worse prognosis for breast cancer survival by race when compared to all other races. The objective of this study is to analyze the relationship between ABO blood type and breast cancer.

Methods: An IRB-approved retrospective study of breast cancer patients who also had blood typing was obtained from the cancer tumor registry between 1993 and 2000. The data was analyzed to stratify ABO blood types, Rh status, and racial and ethnic differences with respect to overall survival. Differences in clinicopathological variables and breast type were evaluated using Kaplan-Meier analyses.

Results: Five hundred forty-one patients were evaluated. Average age was 54±3 years old. The worst prognosis was seen in patients with type A (n = 17) when compared to all other blood types, but was not different between races. Type A was six times more prevalent in Caucasian breast cancer patients than AA. For stage I, blood type A, AA were at 2.6 times increased risk of death compared to Caucasians. For stage II it was 1.7 times (see Figure). This difference in survival by race was not seen for type O, B, or AB.

Conclusions: The etiology of the poorer prognosis of breast cancer in AA has not been explained. Our results are the first to suggest that only AA with blood type A have a worse prognosis when compared to Caucasians even for stage I and II disease and independent of Rh status and unrelated to differences in receptor status. Elicidation of the causal relationship between poorer breast cancer outcomes and blood type may lead to strategies for possible prevention and/or treatment.

1729
Comparison of Axillary Lymph Node Response After Neoadjuvant Chemotherapy Between Patients With Triple-Negative Breast Cancer and Receptor-Positive Disease
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Objective: Neoadjuvant chemotherapy (NAC) can provide eradication of axillary lymph node metastasis in a small number of patients with breast cancer. Triple-negative breast cancer (TNBC) tends to be more chemoresistant and has higher pathologic complete response rate. We questioned whether TNBC patients would be more likely to have eradication of their axillary lymph node metastasis after NAC. Therefore, we compared axillary lymph node response after NAC between patients with TNBC and those tumor characteristics, pre-chemotherapy axillary staging, type and duration of chemotherapy, type of surgical staging procedure, and postchemotherapy axillary lymph node response. Kaplan-Meier survival curves and hazard ratio were calculated to compare the event of death occurred between the two groups.

Methods: A retrospective review of the University of Florida Cancer Registry data was used to identify patients diagnosed with stage II and III breast cancer who had received neoadjuvant chemotherapy from Jan 2000 to Oct 2008. Patients with TNBC and those with any receptor-positive disease (ER, PR, or HER-2/neu positive) were identified. The two groups were compared on tumor characteristics, pre-chemotherapy axillary staging, type and duration of chemotherapy, type of surgical staging procedure, and postchemotherapy axillary lymph node response. Kaplan-Meier survival curves and hazard ratio were calculated to compare the event of death occurred between the two groups.

Results: One hundred sixty-one patients with known tumor profile were treated with NAC. Forty-five patients (28%) had TNBC while 116 (72%) had NtNBC. Patients with TNBC were younger (median age 48 vs 56) and had worse prognosis (36% deceased vs 23%, p = 0.03) with larger tumors that were high grade (90% vs 82%). In the TNBC group, 68% had clinically positive nodes before chemotherapy (vs 85% NtNBC). However, more patients in the TNBC group converted to node-negative status after chemotherapy (42% TNBC vs 27% NtNBC). There was no significant difference in the number of patients who were downstaged (TNBC 27% vs NtNBC 32%). There was no difference in the rate of lumpectomy vs mastectomy, or sentinel node biopsy was considered dication between the two groups. Patients with TNBC mostly received triple-agent chemotherapy with TAC (44% vs 32%). NtNBC patients more commonly received dual-agent chemotherapy (51% vs 25%, p = 0.01). Survival was significantly shorter in TNBC patients who continued to have lymph node metastasis after NAC (19.6 months vs 24 months, p = 0.03). There was no survival difference in patients who converted to node-negative status. Overall, TNBC patients had shorter survival time (X2 = 5.31, p = 0.02) although the hazard ratio was not significantly different.

Conclusions: Patients with TNBC were more likely to achieve eradication of axillary lymph node metastasis after NAC. Axillary node conversion did not improve survival. However, lack of axillary node conversion had a significant adverse effect on survival in TNBC patients. These results may have implications regarding the use of sentinel lymph node biopsy after NAC in TNBC.
Objective: IBTR! was developed as a tool to predict the risk of ipsilateral breast-tumor recurrence (IBTR) after breast-conserving surgery. This nomogram incorporates information regarding patient age, tumor size, tumor grade, margin status, lymphovascular invasion, and use of chemotherapy and hormonal therapy and was validated in a large study of patients treated at the Memorial Sloan-Kettering Cancer Center. While this tool was developed in order to better quantify the risk of postoperative radiation therapy, we sought to explore the potential use of this tool in predicting surgical site infections (SSI).

Methods: Our study included patients who underwent definitive breast cancer surgery with breast-conserving technique at NYU Langone Medical Center between January and September 2010. Excluded from analysis were patients with pure DCIS, and those who underwent neoadjuvant chemotherapy. All patients were counseled as to their options for breast-conserving and mastectomy approaches. Patients were informed of the risk of IBTR, which was estimated at 10% for the purposes of preoperative discussion. In order to calculate the risk of IBTR using the current model, the plan for systemic therapy was utilized without consideration for the possibility of noncompliance with the recommended regimen. Analysis of variance (ANOVA) and descriptive analyses were used to evaluate the association between variables and risk of IBTR.

Results: We had a total of 142 patients with a median age of 61 (range, 28-89 years). Regarding the variables contained in the IBTR! risk model, all our patients had negative margins, 123 (87%) had no lymphovascular invasion, 73 (53%) had a tumor size ≤2 cm, and the majority (65%) had grade 2 tumors. The average predicted IBTR risk in our cohort was 5.7% (range, 1.3-32.7%). A majority of our patients >70 years (60%) had an IBTR risk >3%. There was a statistically significant difference in the IBTR risk scores for the different age groups (p < 0.001).

Conclusions: As patients consider their surgical options prior to definitive breast cancer surgery, the risk of IBTR is an important element in the discussion. In our study, the risk of IBTR predicted by the model is significantly less than the generally quoted risk. In the oldest age group, the low IBTR risk may suggest that these women may not benefit from radiation therapy. In the youngest age group, the predicted IBTR risk should be part of the discussion regarding surgical options. Although the IBTR! Model is difficult to utilize in a prospective manner, it may yield an approximate risk for those women assuming certain standard approaches to systemic treatment. This information may aid patients and physicians in making decisions regarding breast-conserving surgery using a more individualized approach to the risk of IBTR.

1746 Expression of ALDH1 as A Marker of Mammary Stem Cells in Benign and Malignant Breast Lesions
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1University of Michigan, Ann Arbor, MI, 2University of Illinois, Chicago, IL.
Objective: Premenopausal breast cancer and tumors that are negative for the estrogen receptor, the progesterone receptor, and HER2/neu are substantially more common among African and African-American women compared to women of other racial/ethnic background, raising the question of whether African ancestry is associated with a heritable marker for these high-risk patterns of breast cancer in international populations. This work also demonstrates the value of international analyses of benign breast lesions, and it furthermore suggests that ALDH1 expression in malignant and benign breast lesions, and it furthermore suggests that ALDH1 expression in malignant and benign breast lesions, and it furthermore suggests that ALDH1 expression in malignant and benign breast lesions.

Methods: We analyzed benign and malignant breast specimens from Ghanaian women through an international breast cancer research partnership established by the surgical oncology section of the University of Chicago and the Komfo Anokye Teaching Hospital in Kumasi, Ghana. We looked for the frequency of mammary progenitor/stem cells by immunohistochemistry staining for ALDH1 within both stromal and epithelial tissue components of 208 formalin-fixed and paraffin-embedded breast specimens acquired between 2007 and 2009.

Results: Of the 208 samples examined, 104 were benign and 104 were malignant. Within the benign specimens, 55 showed ALDH1 expression (53%) and 49 (47%) did not. Among the malignant specimens, 70 (58%) showed ALDH1 expression and 29 did not (28%) (p = 0.0006). When comparing the specimens that either showed no staining or weak staining to those that had moderate or strong staining, 76 (76%) within the benign group showed none or weak ALDH1 expression and 25 (24%) showed moderate or strong expression. In the malignant group, 54 (52%) showed none or weak expression and 56 (58%) showed moderate or strong expression (p = 0.0000).

Conclusions: Our study indicates that there is a statistically significant difference between ALDH1 expression in malignant and benign breast lesions, and it furthermore suggests that mammary stem cells (as detected by ALDH1 expression) are more commonly present in the breast tissue of women from Ghana. These findings may be a factor in the known increased frequency of early-onset and triple-negative breast cancer of Ghanaian women. Further studies are necessary to confirm our findings and to fully understand their clinical significance regarding the biology of breast cancer in international populations. This work also demonstrates the value of international breast oncology collaborative efforts.

1737 Assessment of the Memorial Sloan-Kettering Cancer Center Nomogram for the Prediction of Post-Mastectomy Lymph Node Metastasis
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Objective: The Memorial Sloan-Kettering Cancer Center (MSKCC) nomogram to predict sentinel lymph node (SLN) metastasis was developed and validated predominately in women; men have an increased risk for triple-negative breast cancer. The aim of our study was to investigate the value of the MSKCC nomogram in men.

Methods: We had a total of 142 patients with a median age of 61 (range, 28-89 years). Regarding the variables contained in the IBTR! risk model, all our patients had negative margins, 123 (87%) had no lymphovascular invasion, 73 (53%) had a tumor size ≤2 cm, and the majority (65%) had grade 2 tumors. The average predicted IBTR risk in our cohort was 5.7% (range, 1.3-32.7%). A majority of our patients >70 years (60%) had an IBTR risk >3%. There was a statistically significant difference in the IBTR risk scores for the different age groups (p < 0.001).

Conclusions: As patients consider their surgical options prior to definitive breast cancer surgery, the risk of IBTR is an important element in the discussion. In our study, the risk of IBTR predicted by the model is significantly less than the generally quoted risk. In the oldest age group, the low IBTR risk may suggest that these women may not benefit from radiation therapy. In the youngest age group, the predicted IBTR risk should be part of the discussion regarding surgical options. Although the IBTR! Model is difficult to utilize in a prospective manner, it may yield an approximate risk for those women assuming certain standard approaches to systemic treatment. This information may aid patients and physicians in making decisions regarding breast-conserving surgery using a more individualized approach to the risk of IBTR.

Methods: With institutional review board approval and patient consent, patients undergoing total mastectomy (TM) without reconstruction and/or axillary lymph node dissection (ALND) were randomized to standard drain care (control) or drain antisepsis (treated). Surgeons were blinded to an individual’s assignment. Drain interventions were instituted and patients were instructed how to drain care for drains on postoperative day (POD) 1 by nurse study coordinators. Control patients cleaned the drain site twice daily with alcohol swabs. Treated patients performed antisepsis procedures until drain removal and included: (1) a chlorhexidine impregnated disk (BPATC83; Johnson & Johnson Medical) placed at the drain exit site and changed every 3 days, and (2) drain bulb irrigation with dilute sodium hypochlorite solution (Dakin’s solution 0.25% twice daily. Semiquantitative aerobic and anaerobic cultures of drainage fluid were obtained steriley for all patients at POD 6-8 and at time of drain removal if POD 6-8. In most patients, a 5-cm portion of intraprosternal drain, 1 cm proximal to the exit site, was also cultured at drain removal. Rates of drain fluid and tubing colonization (no growth and <50 CFU, respectively) between the control and treated groups were compared.

Results: Overall, 87 patients were enrolled and 76 patients with 96 drains completed the study: 40 patients (52 drains) were randomized to drain antisepsis and 36 patients (44 drains) to the control group. Antibiotics were administered to all patients prior to incision and discontinued within 24 hours. ALND, and TM/ALND were performed in 49, 4, and 23 patients, respectively. Median duration of operation was 2 hr 20 min (range, 1:12-4:55). Median duration of drain use was 7 days (range, 5-23 days), with a median output of 23 ml (range, 3-95 ml) for the preceding 24 hours at POD 6-8. Cultures of drain bulb fluid at POD 6-8 were positive for control drains and 23% of treated drains (12/52), (p = 0.001). Drain tubing was cultured at time of drain removal from 52 patients (67 drains - 29 control and 38 antisepsis) and was positive in 21% (6/29) of control drains and 0% (0/38) of treated drains (p = 0.005). Among drains with positive bulb fluid cultures at the time of drain removal, the drain tubing also cultured positive in 32% (6/19) of controls (p = 0.01) and 50% (10/19) of treated drains (p = 0.001; odds ratio = 1.13). Three patients in the control group and one patient in the treated group (p = 0.34) (see Table).

Conclusions: Simple and inexpensive local antiseptic interventions with a chlorhexidine disk and hypochlorite solution reduce bacterial colonization of drains. Further study of drain antisepsis and its impact on SSI rate is warranted.
Validity of "Additional Nodal Metastasis" Breast Cancer Nomogram of Memorial Sloan-Kettering Cancer Center in African American Women

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1University of Cincinnati, Department of Surgery, Cincinnati, OH, 2University of Cincinnati, Department of Environmental Health, Cincinnati, OH

Objective: Among patients treated at Memorial Sloan Kettering Cancer Center (MSKCC) an Additional Nodal Metastasis Nomogram was utilized to estimate further axillary nodal involvement. This nomogram has been validated in predominantly European American and European populations. The incidence of breast cancer in African American women (AAW) is less than the European counterpart, but it presents earlier, possibly with a more aggressive tumor biology. The aim of this study is to assess the predictive accuracy of this nomogram in AAW with breast cancer, as these patients constitute 50% of our current population.

Methods: In the retrospective review of medical charts, we identified 52 AAW who meet nomogram’s criteria and underwent sentinel node biopsy and ALND between 1998 and 2010. We extracted the pertinent data for the nomogram variables for each patient, and calculated the risk of further nodal metastasis per the nomogram (predictive probability). In analyzing this data, the receiver operating characteristics (ROC) curve was constructed to assess the predictive probability of additional axillary nodal involvement in discriminating the observed additional nodal status in our population. The greater identification of estrogen receptors in tumors of postmenopausal women, this data was also evaluated by menopausal status.

Results: The mean age of this population was 75 years, with 20 women younger than 50 years and 32 women older than 50 years. Of 52 patients with sentinel node involvement, 22 (42.3%) had further positive axillary nodes. Still, 71.1% of these tumors expressed estrogen receptors. In constructing the ROC, the area under the curve (AUC) was found to be 0.74 (95% CI, 0.60-0.89), close to that of MSKCC (0.78). In applying this nomogram to our patients, a predicted probability > 34% of further nonsentinel node involvement provides a 72.1% likelihood of correct classification, maximizing sensitivity (68.2%) and specificity (76.7%). There was no significant difference in the AUC between pre- and post-menopausal women. If we stratify our AAW among the European American patients (22 patients) the mean age at intermedian 10.2% (1.0%); p < 0.05; we find that a risk > 20% of our patients are at risk, this nomogram may not be as reliable a predictor for low risk in AAW as it is a predictor for high risk in our patients. A strong argument can be made for those patients at intermediate- or high-risk probability for completing the standard of ALND.

Conclusion: The MSKCC nomogram to predict additional nodal metastasis has been validated in our population of AAW, and can be used as a predictive tool. Given few women are at a low-risk, this nomogram may not be as reliable a predictor for low risk in AAW as it is a predictor for high risk in our patients. A strong argument can be made for those patients at intermediate- or high-risk probability for completing the standard of ALND.

Table: Distribution of patients with non-sentinel lymph node involvement according to risk class and predicted probability with nomogram.

<table>
<thead>
<tr>
<th>Risk Class</th>
<th>No. (%)</th>
<th>Positive Nonsentinel Nodes (%)</th>
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<tbody>
<tr>
<td>&lt;10</td>
<td>0 (0.00)</td>
<td>0%</td>
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<tr>
<td>10-20</td>
<td>12 (22)</td>
<td>0%</td>
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<tr>
<td>&gt;20</td>
<td>31 (59.6)</td>
<td>6%</td>
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1750 Improved Positive Margin Rate Found in a Prospective, Multicenter, Randomized, Double-Arm Study Using a Novel Intraoperative Margin Assessment Device

Lorraine Tafra, The MarginProbe Study Group
The AMAC Breast Center, Ann Arbor, MI

Objective: Positive margins following BCS are a significant problem, frequently leading to further procedures, increased complications, and decreased patient satisfaction. The MarginProbe device (Medtronic, Minneapolis, MN) is a novel, handheld ultrasound device for margin assessment and can be used intraoperatively as a margin device to improve positive margin rates after BCT. We sought to determine if the rate of patients with postoperative positive margins could be improved by using a novel device (MarginProbe™) in the setting of a prospective, double-arm study (ClinicalTrials.gov: NCT01445444).

Methods: A total of 150 women were enrolled in the multicenter (n = 21), prospective, randomized trial. Inclusion criteria included women with nonpalpable, histologically diagnosed carcinoma of the breast, requiring image-guided localization, undergoing lumpectomy. Exclusion criteria included women with DCIS, tumors with margins <1 mm, and patients who were non-English speaking. All 151 patients were randomized prospectively to use the MarginProbe device or not (control). The primary endpoint was complete surgical resection (CSR), the rate of patient with histologically positive margins <1 mm) on specimen in whom all positive margins were re-excised (accounting for deep margins to fascia or anterior margins to skin for which no further tissue could be excised). Additionally, margin-level device performance was assessed.

Results: Five hundred ninety-six patients were randomized, while 68 patients (selected at consent) were used as device training cases. Analyses were performed on randomized patients. As expected, the rate of main specimens with positive margins was similar in each group (54.7% [163/298] for device vs 49.3% [147/298] for control, p = 0.19). The rate of patients with positive margins after the primary surgery was 30.9% (92/298) for device vs 41.6% (124/298) for control (p = 0.008). Sources of positive margins (1) incomplete removal of all main specimen positive margins, 20.8% (62/298) for device vs 38.3% (114/298) for control (p = 0.0001), and (2) new margins from cavity re-excision, 10.3% (30/298) for device vs 1.3% (10/298) for control (p = 0.002). In the device arm, the rate of CSR was 71.2% (N = 116/163 vs 22.4% (N = 35/147) for control (p < 0.0001) for patients with positive specimens. The rate of patients requiring re-lumpectomies due to positive margins was 5.4% (16/298) for device vs 15.0% (45/298) for control (p = 0.0003). The average total tissue volume removed from all lumpectomies was 93 cc for device vs 85 cc for control. The average total tissue volume removed, normalized to tumor size, was significantly different between the 2 groups (average volume of specimen tissue removed was 15.0% for device vs 12.5% for control).

Conclusion: This study, using a novel device to assess margins intraoperatively on lumpectomy specimens of patients undergoing BCS, successfully achieved a lower positive margin rate and reduced number of re-lumpectomies per device. In addition, use of the device led to minimal additional breast tissue removed.
1680 Clinical Utility and Therapeutic Implications of Oncotype Analysis in Patients With Breast Cancer Ta-Tai Hsiao1, Anne R. McSwain2, Martin Ojogun-Itu1, Maud Tabbara1, Christine B. Teall3

1The George Washington University Department of Surgery, Washington, DC; 2The George Washington University Department of Radiology, Washington, DC; 3The George Washington University Department of Nursing, Washington, DC.

Objective: Oncotype DX is a gene expression assay used for patients with early-stage, estrogen receptor positive breast cancer. It identifies the molecular signature of a patient’s breast cancer by analyzing 21 genes with a clinical specimen. This information is used to determine whether the recurrence score is low (low risk of recurrence), intermediate (intermediate risk of recurrence) or high (high risk of recurrence). For each case, panel members were asked to individually estimate the Oncotype DX recurrence risk score. The group recommended appropriate adjuvant therapy both before and after the diagnosis of breast cancer.

Methods: We identified a developing country with resources for cancer care and where female average life expectancy is over 70 years. Our team consisted of four residents, seven medical students, two nurses, and a social worker in the country’s infrastructure. We designed a culturally sensitive and cost-effective model to enhance breast care in Ecuador. The goal was to create screening and early detection and treatment strategies to eliminate disparities must focus on providing patients in the field with culturally sensitive care. Traditional screening mammograms based on age. We evaluated 147 patients with palpable findings (17%) and non-palpable findings (83%). Patients were matched to a control group and received a comprehensive medical intervention. The intervention included a week of medical intervention, which included physician visits, diagnostic imaging, and surgical interventions.

Results: During our week of medical intervention, we bridged gaps in education and expanded access to breast care by over 30%. Furthermore, new cases of breast cancer were diagnosed. This approach using minimal resources in a restricted timeframe demonstrated a highly effective model for improving breast health in an underserved area. Future study will assess patient outcomes and the reproducibility of our model in other settings.

Methods: Upon learning the recurrence score, panel members changed their treatment recommendation in 27 of 63 (43%) cases. Nineteen patients (30%) who were initially recommended chemotherapy were found to have a low risk of recurrence, resulting in a group recommendation for hormonal therapy alone. Eight patients (13%) were initially recommended hormonal therapy alone, but intermediate or high recurrence scores resulted in a change to hormonal therapy plus chemotherapy. Thirty-six patients (57%) had no change in their treatment recommendations. Recurrence risk was estimated correctly in 44.4% of cases. The surgical oncologists were correct in 46.8% of cases, the radiation oncologists in 42.9%, and the medical oncologists in 43.9%. These differences were not found to be statistically significant.

Conclusions: To our knowledge, Oncotype DX testing changed management in a significant proportion of patients compared to traditional guidelines alone. Physicians, regardless of specialty, were able to estimate the recurrence score less than half of the patients. Oncotype DX assay should be used in eligible patients to ensure that the appropriate adjuvant therapy is recommended.

1735 Breast Care Ecuador: A Model to Expand Access in Underserved Areas Lesley Taylor1, Beth C Freedman2, Amanda J Rheue1, Julian Arc2, Rosanne Newell3

1Department of Surgery, Columbia University, New York, NY; 2Department of Surgery, St. Luke’s-Episcopal Medical Center, New York, NY; 3Department of Pathology, Montefiore/Albert Einstein College of Medicine, Bronx, NY.

Objective: To develop and test a culturally sensitive, cost-effective model to enhance breast care in Ecuador. The goal was to create screening and early detection and treatment strategies to eliminate disparities. Traditional screening mammograms based on age. We evaluated 147 patients with palpable findings (17%) and non-palpable findings (83%). Patients were matched to a control group and received a comprehensive medical intervention. The intervention included a week of medical intervention, which included physician visits, diagnostic imaging, and surgical interventions.

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Results: During our week of medical intervention, we bridged gaps in education and expanded access to breast care by over 30%. Furthermore, new cases of breast cancer were diagnosed. This approach using minimal resources in a restricted timeframe demonstrated a highly effective model for improving breast health in an underserved area. Future study will assess patient outcomes and the reproducibility of our model in other settings.

Methods: Upon learning the recurrence score, panel members changed their treatment recommendation in 27 of 63 (43%) cases. Nineteen patients (30%) who were initially recommended chemotherapy were found to have a low risk of recurrence, resulting in a group recommendation for hormonal therapy alone. Eight patients (13%) were initially recommended hormonal therapy alone, but intermediate or high recurrence scores resulted in a change to hormonal therapy plus chemotherapy. Thirty-six patients (57%) had no change in their treatment recommendations. Recurrence risk was estimated correctly in 44.4% of cases. The surgical oncologists were correct in 46.8% of cases, the radiation oncologists in 42.9%, and the medical oncologists in 43.9%. These differences were not found to be statistically significant.

Conclusions: To our knowledge, Oncotype DX testing changed management in a significant proportion of patients compared to traditional guidelines alone. Physicians, regardless of specialty, were able to estimate the recurrence score less than half of the patients. Oncotype DX assay should be used in eligible patients to ensure that the appropriate adjuvant therapy is recommended.
Poster Presentations

1663

Complications of Immediate Breast Reconstruction Do Not Cause Treatment Delays
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Objective: Immediate breast reconstruction following breast cancer surgery may not be offered to patients due to concerns regarding potential adjuvant treatment delays resulting from surgical complications. We sought to determine delays in time to adjuvant radiation and systemic therapy associated with surgical complications for patients undergoing concurrent breast oncologic and reconstructive procedures.
Methods: A retrospective review was performed of sequential patients undergoing combined oncologic and plastic surgical procedures for in situ or invasive carcinoma between January 2005 and June 2010 who were treated with adjuvant systemic and/or radiation therapy at a single institution. Patients were compared for time from surgery to initial adjuvant systemic or radiation therapy by surgical complications (infection, hematoma, seroma, lymphedema, fat necrosis, flap necrosis, implant extrusion and/or removal, mastectomy skin loss, full or partial nipple areolar complex ischemia). Patients were excluded from analysis if they had recurrent disease, or if they received preoperative systemic or radiation therapy.
Results: During the study period, 61 patients were identified. The average age was 56.8 years (range, 26-82) and median follow-up was 239 days (range, 32-302). Pathologic diagnoses included invasive ductal carcinoma (77.1%), ductal carcinoma in situ (19.7%), and invasive lobular carcinoma (3.3%). Patients presented with stage I disease in 51.7% of cases; stage II, in 22.4%; stage O, in 20.7%; and stage III, in 5.2%. Patients underwent immediate reconstruction of a partial mastectomy defect in 41.0% and total mastectomy defect in 69.0% of cases. Bilateral reconstruction was performed in 67.2% of cases. Type of plastic surgical reconstruction was in suspension in 65.5% of cases; tissue expander/implant in 25.2%, both, in 8.3%. A total of 58 (95.1%) patients received systemic therapy alone or prior to initiation of radiation and 12 (19.7%) patients received radiation therapy alone or prior to initiation of systemic therapy. The median length of time from date of surgery to date of initiation of systemic therapy was 53.5 days (IQR = 16.3), and the median length of time to initiation of radiation therapy was 41.5 days (8-237). One half of patients (50.8%) had a postoperative complication. When stratified by complication, there were no significant differences in time to initial systemic therapy or radiation therapy (see table).
Conclusions: In the current series, complications from concurrent oncologic and reconstructive breast surgery were not associated with adverse delays in initiation of adjuvant systemic or radiation therapy. Although further improvement in overall complication rates and time to adjuvant therapy is warranted, women undergoing breast cancer surgery can safely be offered immediate reconstruction of partial or total mastectomy defects.

1673

Factors Predicting the Non-Sentinel Lymph Node Metastasis in Breast Cancer Patients With Sentinel Lymph Node Micrometastasis
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Objective: In a previous proportion of patients, the sentinel lymph node (SNL) is the only involved axillary node. Scoring systems using clinicopathological characteristics have been developed to predict the probability of non-SNL metastases among those patients with a positive SNL. The goal of the present study was to identify factors associated with a positive SNL biopsy and the metastatic involvement of non-SNLs to define a subgroup of patients in whom axillary dissection may be omitted.
Methods: Data was reviewed for 353 patients diagnosed with clinical operable T1-3 N0 invasive breast cancer who underwent SNL biopsy with or without axillary dissection in a single institution between July 2000 and May 2010. All the sentinel lymph nodes were examined by serial sectioning (50 µm) of the entire lymph node and H&E staining, and by cytochemistry immunostaining in suspicious cases.
Results: The SNL were found to be involved with tumor cells in 147 patients (41.6%). Of those, 39 patients (26.5%) had micrometastases (tumor size: < 2 mm) whereas 88 patients (60.5%) were found to be macrometastases (tumor size ≥ 2 mm). Nineteen patients (11%) had isolated tumor cells (ITC) detected by H&E staining or immunohistochemistry (≤ 0.2 mm).
Factors predicting a positive sentinel lymph node biopsy were tumor size more than 2 cm (OR = 2.7, 95% CI, 1.5-4.7, p = 0.001) and presence of lymphovascular invasion (OR = 7.5, 95% CI, 4.3-13) in both univariate and multivariate analyses. However, finding of ITC or micrometastasis in sentinel lymph nodes was the only predicting factor of not having a positive SNL. The goal of the present study was to identify factors associated with a positive SNL biopsy and the metastatic involvement of non-SNLs to define a subgroup of patients in whom axillary dissection may be omitted.

Conclusions: These findings indicate that size of metastasis is the strongest predictor of the presence of nonsentinel lymph node metastasis. Our results suggest further axillary surgery can best be omitted in patients with small size tumors among those with ITC or micrometastasis in SNL. Therefore, validation of nomograms including different clinicopathological factors or biological markers should better be studied in patients with ITC or micrometastasis in SNL.

1644

Predicting Axillary Nodal Positivty Using Clinical Exam, Mammography, Ultrasonography, and MRI
Stephanie Valente1, Gary Levine2, Jessica Rayhanabad3, Janie Weng-Grumley4, Melvin Silverstein5
1Peck School of Medicine, University of Southern California, Los Angeles, CA, 2Breast Service, Hoag Memorial Hospital Presbyterian, Newport Beach, CA
Objective: Axillary lymph node status continues to be the single most important prognostic variable regarding breast cancer survival. We were interested in our ability to predict axillary nodal involvement using clinical examination and standard breast imaging studies.
Methods: Two hundred nine consecutive patients with invasive breast carcinoma who underwent clinical examination of the axilla, mammography, axillary ultrasound, MRI, and histopathologic evaluation of one or more axillary nodes were included.
Results: Fifty-five of 209 (26%) patients had positive N1-3 axillary nodes. Ten patients with isolated tumor cells (less than 200 tumor cells), N0(+), were considered node negative and included in the node-negative group. Using all modalities combined, the true positive rate was only 56% and the false-positive rate was 14%. Sensitivity was 51% and specificity was 88%. If all four modalities were negative, 85% of patients has histologically negative nodes and 15% were node positive.
Conclusions: Imaging and clinical examination, alone or in combination, while extremely helpful for treatment planning, are poor predictors of axillary lymph node involvement.

Table.

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<tr>
<th>Node Positive</th>
<th>Node Negative</th>
<th>P Value</th>
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<tbody>
<tr>
<td>N</td>
<td>154</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Suspicious by:
- Clinical exam 19 (35%) 5 (3%) <0.0001
- Mammography 10 (18%) 5 (3%) <0.002
- Ultrasound 24 (44%) 11 (7%) <0.001
- MRI 21 (38%) 13 (7%) <0.001

1642

Difference in Recurrence Patterns By Treatment in Patients With DCIS
Janie W Grumley, Michael D Lagios, Jessica Rayhanabad, Stephanie Valente, Melvin J Silverstein
Breast Service, Hoag Memorial Presbyterian, Newport Beach, CA and Division of Breast and Soft Tissue Surgery, Department of Surgery, University of Southern California, Los Angeles, CA
Objective: Ductal carcinoma in situ (DCIS) is commonly treated using wide local excision with or without postoperative radiation therapy. Radiation therapy is known to reduce the local recurrence rate by a relative 50%. We were interested in whether the pattern of local recurrence (invasive versus noninvasive, quadrant of recurrence, time to recurrence) and breast cancer specific survival changed with the addition of radiation therapy.
Methods: Using a prospective database, 1,000 patients with pure DCIS who underwent breast-conserving surgery were analyzed for type of local recurrence (invasive versus DCIS), median time to recurrence, quadrant of recurrence (same or different), and breast cancer specific survival. Proportions of local recurrence were derived using the Kaplan-Meier method. Probabilities were compared using the log-rank test.
Results: Radiated patients had a significantly lower 10-year probability of recurrence but a higher rate of invasive recurrences, longer time to diagnosis of recurrence, and a slightly lower but significant 10-year breast cancer specific survival when compared to patients not treated with radiation.
Conclusions: Our data confirm an approximate 50% reduction in local recurrence if radiation therapy is given and consistent with the published prospective randomized data, but the pattern of recurrence in irradiated patients differs significantly from excision-only patients. Twenty-six per cent of postirradiation recurrences were in different quadrants, in essence, new cancers, compared with only 9% for excision-only patients. Irradiated patients who recurred took about twice as long to recur. This was true for both invasive and DCIS recurrences. When irradiated patients recurred, they had a higher percentage of invasive recurrences. This resulted in a statistically significant lower 10-yr breast cancer specific survival.

Table.

<table>
<thead>
<tr>
<th>Excision Alone</th>
<th>Excision Plus Radiation Therapy</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients 644 356</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average follow-up 72 mo 109 mo &lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-yr Probability any local recurrence 35% 17% 0.0007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Invasive local recurrence 37% 57% 0.009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-yr prob invasive local recurrence 12.5% 9.5% 0.85(NS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median time to any local recurrence 34 mo 72 mo &lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median time local recurrence same quadrant 31 mo 57 mo &lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median time local recurrence different quadrant 31 mo 57 mo &lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td># Recurrences same quadrant 55 mo 144 mo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median time to recurrent same quadrant 102/122 48/65 (91%) (74%) 0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to recurrent different quadrant 23 mo 48 mo &lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median time to invasive recurrence 52 mo 108 mo &lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-yr breast cancer specific Survival 99.7% 98.3% 0.02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1643 Predicting Breast Cancer Outcome and Nodal Metastasis by Routine Histopathology Compared to Hormonal Receptor Status and HER2 Overexpression

Janie Wong Grumsley, Heather MacDonald, Stephanie Valente, Jessica Rayhanabad, Melvin I Silverstein

Breast Service, Hoag Memorial Hospital Presbyterian, Newport Beach, CA, and Division of Breast and Soft Tissue Surgery, Department of Surgery, University of Southern California, Los Angeles, CA

Objective: Nuclear grade, histologic grade, and mitotic grade are routinely determined during histopathologic examination of breast cancer, unlike sophisticated immunohistochemical staining or molecular typing. We were interested in using histologic grading to predict nodal positivity and breast cancer specific survival and comparing the predictability of histologic grading with more costly examinations.

Methods: A prospective breast cancer database was reviewed. One thousand six hundred patients with infiltrating ductal carcinoma were evaluated. All had nuclear grade, histologic grade, and mitotic grade. One thousand two hundred ninety-nine of these patients had estrogen receptor and progesterone receptor status and 902 of these patients had HER2 status.

Results: Nuclear grade, histologic grade, and mitotic grade were able to predict nodal positivity and breast cancer specific survival. All differences were statistically significant. Estrogen receptor, progesterone receptor, and HER2 status were able to predict breast cancer specific survival but not nodal positivity. This suggests that the mechanism by which molecular markers affect survival is independent of nodal positivity.

Table:

<table>
<thead>
<tr>
<th>Histologic Grade</th>
<th># Positive Nodes/Total [%]</th>
<th>Breast Cancer Specific Survival at 12 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42/227 (19)</td>
<td>98%</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>384/738 (44)</td>
<td>81%</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0004</td>
<td></td>
</tr>
<tr>
<td>Nuclear Grade</td>
<td>1</td>
<td>13/136 (9)</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt; 0.0001</td>
<td>99%</td>
</tr>
<tr>
<td>2</td>
<td>324/771 (33)</td>
<td>91%</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>Mitotic Grade</td>
<td>1</td>
<td>268/931 (29)</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt; 0.0001</td>
<td>93%</td>
</tr>
<tr>
<td>2</td>
<td>168/372 (45)</td>
<td>82%</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>ER</td>
<td>Positive</td>
<td>38/966 (38)</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt; 0.0001</td>
<td>87%</td>
</tr>
<tr>
<td>Negative</td>
<td>12/313 (39)</td>
<td>79%</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0002</td>
<td></td>
</tr>
<tr>
<td>PR</td>
<td>Positive</td>
<td>317/863 (37)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.007</td>
<td>87%</td>
</tr>
<tr>
<td>Negative</td>
<td>144/846 (42)</td>
<td>82%</td>
</tr>
<tr>
<td>p-value</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>HER 2</td>
<td>Positive</td>
<td>87/300 (43)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0005</td>
<td>79%</td>
</tr>
<tr>
<td>Negative</td>
<td>258/702 (37)</td>
<td>93%</td>
</tr>
</tbody>
</table>

Conclusions: At our institution, the diagnosis of papillary cancer remains a relatively rare occurrence. The overall findings suggest a favorable prognosis, similar to that reported in literature.

1722 Encysted and Solid Papillary Carcinomas of the Breast

Kristine Widders, Nayanika Dekhne, Mitul Amin

William Beaumont Hospital, Royal Oak, MI

Objective: Encysted and solid papillary carcinomas (PC) of breast make up about 0.5-1% of all breast cancers. There is some lack of consensus within expert pathologists as to the exact nomenclature of these lesions, as well as regards presence and size of invasion. This would obviously create treatment dilemmas for adjuvant treatment. There is no difference in patient age, tumor size, AJCC staging, and family history for the three time periods. MR use significantly increased from 20% in the pre-MR group to 70% in the post-MR group (p < 0.05). There was no statistically significant change in the initial use of unilateral mastectomy and mastectomy because of positive tumor margins (pre-MR: 18%, 4%; post-MR: 20%, 2%). There was a dramatic increase in use of bilateral mastectomy in the initial treatment of breast cancer with 3% of (4%) of patients selecting this option in the pre-MR period and 9% (14%) in the post-MR period (p < 0.05). The most frequent reason for selecting bilateral mastectomy was patient preference (3 patients in the pre-MR group and 10 in the post-MR group). Preoperative breast MR identified four occult contralateral cancers in the post-MR group.

Conclusions: The use of breast MRI in the initial workup of breast cancer patients has markedly increased at our institution. The increase in preoperative breast MR was not associated with a significant increase in unilateral mastectomy or mastectomy because of positive tumor margins. The increase in bilateral mastectomy is secondary to patient preference.

1639 3D-MRI and 3D-CT Mammary Lymphography Can Predict the Sentinel Node Metastasis.

Koji Yamashita, Kazuo Shimizu, Shunsuke Haga

Department of Surgery, Nippon Medical School, Tokyo, Japan

Objective: 3D-CT lymphography (LG) can show the detailed lymphatic network of the breast and the axilla, and can contribute to more accurate sentinel node (SN) biopsy. We reported the effectiveness of SPECT-fused 3D-CT LG for surgery at the last meeting. Now, we applied 3-tesla-3D-MRI to enhance SN and to match with the SN detected by 3D-CT LG. It shows the typical shape of the metastasized lymph node. We tried to predict the SN metastasis before surgery by the enhanced patterns of SN.

Methods: 3D-MRI was performed to mark SN on the skin before surgery. Above the tumor and near the areola, 2 ml of Iopamidol 300 was injected subcutaneously. Images of CT scan were taken at 1 and 3 min after injection to produce a 3D image of lymph ducts and nodes. The dynamic contrast-enhanced MRI of the breast was performed using 3T MRI by bolus injection of gadolinium. TI-weighted fat-suppressed images were reconstructed to 3D images to show the shape of SN. SN biopsy was performed by dye and RI method using the endoscopic technique. The skin incision was made 1 cm long in the axilla on the marked position.

Results: We have performed 3D-CT LG on 180 patients and evaluated SN in 3D-MRI on 30 patients. The average age was 55.1 years old. The average tumor size was 2.4 cm. The average sampled number of SN was 2.3. SN metastasis was observed on 16 patients and not on 34 patients. Only sentinel node metastasis was on 10 patients (82%). There was no false-negative study. We performed mammary 3D-CT LG on 180 patients, and the video-assisted breast-conserving surgery on 42 patients. The comparison of 3D-CT LG and 3D-MRI shows the comparable enhancement in 18 patients. Eight were metastasized among them. The enhanced shapes of SN were classified to three patterns. Whole enhanced pattern was observed on 34, partial enhanced pattern was on 19, and nonenhanced pattern was on 6. 3D-MRI was more sensitive to metastasis because of the differentiation of the enhanced pattern of SN with 3D-MRI. They will help the accurate SN biopsy and will be the indication tools to decide the axillary surgery: SN biopsy or axillary preservation.
Modified Round Block Technique for Breast-Conserving Surgery
Hisamitsu Zaha
Nakagami Hospital, Okinawa, Japan

Objective: In breast-conserving surgery (BCS), periareolar incisions are frequently employed for superior aesthetic outcomes. However, it is usually difficult to access distant located tumors from the areola, and also difficult to resect a tumor when a size of the areola is small. We developed round block technique as those countermeasures, and report our experience of BCS using new modified round block technique (MRBT).

Methods: A circumferential periareolar incision was made along the outer wedge of the areola, and deep subcutaneous dissection was extended to the entire breast. The nipple areola complex (NAC) was completely detached from the sounding skin flap. The round wound was widen by being applied a wound retractor, and could be moved over the distant tumor location because the skin flap was widely separated from the breast parenchyma. Then the lesion around the tumor was well visualized, and wide excision was easily performed directly beneath the wound. Partial mastectomy defect was also easily repaired by mobilizing and suturing the well-dissected surrounding breast parenchyma.

Results: Twenty cases of BCS with MRBT were performed during a 24-month period. All patients have small to medium breasts. The mean size of the areola was 3.5 cm in diameter, and eight patients have the smaller areolas less than 3 cm in diameter. The mean tumor size was 2.3 cm, and the mean distance between the nipple and the tumor was 6.0 cm. Morbidity included only one postoperative hematoma treated conservatively. Cosmetic results were mostly satisfactory with minimal scar formation around the NAC. There is one positive margin, and no local recurrence so far.

Conclusions: Although a follow-up period is short, MRBT may be useful and easy technique in BCS for patients who have distant located tumors from the NAC, or who have small areolas.