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
Perceptions of Contralateral Breast Cancer: An Overestimation of Risk

AM Abdallah, NH Ruehle, KM Kurtz, TM Tuttle

1Department of Medicine, University of Minnesota, Minneapolis, MN

Objective: Among patients with unilateral breast cancer, without BRCA mutation, the cumulative-10 year risk of contralateral breast cancer has been estimated to be less than 10%. However, there are several case reports in the literature demonstrating a relatively small, but not negligible, risk of developing breast cancer in the contralateral breast. The purpose of this study was to understand women’s perceptions of their contralateral breast cancer risk at the time of diagnosis and use this information to guide future directions of research.

Methods: We surveyed a diverse sample of women who were diagnosed with breast cancer at a single academic medical center. The sample was stratified by race and ethnicity, and included women from different stages of life. The survey included questions about women’s perceptions of their contralateral breast cancer risk, as well as their experiences with breast cancer screening.

Results: The survey was completed by 453 women with an average age of 53.0 years. Diagnoses included breast cancer (66.7%), lobular breast cancer (11.5%), and DCIS (17.8%). Most patients had estrogen receptor positive (80.8%), tumor with a median size of 1.7 cm, and 44.2% of patients had a family history of breast cancer. The majority of patients (56.1%) had breast-conserving surgery (BCS); 17.1% had bilateral mastectomy, including CNB, and 12.2% had unilateral mastectomy (UM). Overall, women grossly overestimated their risk of developing breast cancer in the contralateral breast. The mean estimated 10-year risk of contralateral breast cancer was 12.6% (95% CI, 23.9% to 41.3%) and 2.6% ± 0.19 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 BCS. The mean perceived risk of recurrence was 40.7% (95% CI, 32.2% to 49.2%) and 2.7% ± 0.18 on the rank scale. The mean perceived risk for developing metastatic disease was 27.7% (95% CI, 34.7% to 20.7%) and 2.5% ± 0.16 on the rank scale. The perceived risk of developing breast cancer was significantly different between women who ultimately underwent CPM versus BCS at UM (3.1 vs 2.5, p = 0.18). Likewise, we found no significant differences in anxiety, difficulty sleeping, or unhappiness between patients who underwent CPM versus those who did not.

Conclusions: At the time of surgical evaluation, women with unilateral breast cancer grossly overestimated their risk of developing breast cancer in the contralateral breast. Nevertheless, CNB patients were not significantly associated with perceived risk of contralateral breast cancer. This finding highlights the importance of early surgeon 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.

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

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<tr>
<th>Variable</th>
<th>OR (95% CI)</th>
<th>p value</th>
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The Potential Impact of USPSTF Recommendations on the Early Diagnosis of Breast Cancer

Roberta Ragan1, John Morgan2, Jan Wong3, Sharon Lum1

1Loma Linda University School 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 U.S. Preventive Services Task Force (USPSTF) guidelines recommend annual screening mammography in women 40-49 years of age. However, breast cancer occurs at a relatively younger age in Hispanic, Asian/PI, and NH black women, and is considered of lower socioeconomic status (SES). We hypothesized that screening at a younger age may be important for detecting earlier and more treatable cancers for women in these demographic groups. We sought to determine the potential impact of the USPSTF recommendations on women 40-49 diagnosed with breast cancer in California.

Methods: All female patients age 40-74 years who were diagnosed with DCIS or T1N0 breast cancer between 2004 and 2008 with records in the California Cancer Registry were evaluated. Patients were divided into two age groups: (1) women age 40-49 years, who are excluded from USPSTF recommendations for screening, and (2) women age 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 (ER) status, using Pearson chi-squared and logistic regression analysis. ER-positive and triple-negative (TN) status were evaluated for cases of invasive cancer.

Results: The 92% (48,280) patients were 40-49 years, and 77% 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 tumors, and 3.1% had triple-negative tumors. More patients were of the Highest SES quintile (23.6%) than lowest (9.6%). The majority of patients were NH white (65.5%), while 12.8% were Asian/Pacific Islander (PI), and 5.4% were NH black. Odds ratios and 95% confidence intervals for DCIS or T1N0 breast cancer in women age 40-49 years versus age 50-74 years are provided in Table 1. Younger women with DCIS were statistically more likely to be HR positive, higher SES, and Hispanic and Asian/PI race/ethnicity, while younger women diagnosed with T1N0 breast cancer were more likely to be HER-2 positive, lower SES, and of non-white race/ethnicity.

Conclusions: Young Hispanic, Asian/PI, and NH black women in California are at increased risk for being diagnosed with early breast cancer than their older counterparts. The lower likelihood of diagnosing DCIS in NH black women may be related to delayed access to screening and care or earlier onset of invasive disease. Excluding 40- to 49-year-old women from screening could impact early diagnosis of HR positive, HER-2 positive, and TN cancers. The implementation of the USPSTF recommendations would disproportionately impact non-white women and potentially lead to more advanced presentation at diagnosis. The impact of these recommendations on survival disparities for non-white and lower SES women warrants further investigation.
Lymph Node Ratio Should Be Incorporated Into Staging for Breast Cancer
Anees B Chagpar, Robert L Camp, David L Rimm
Yale University, New Haven, CT

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 (0-0.2), intermediate (0.2-0.65), and high (>0.65) risk categories, 90 (28.2%) 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 overall survival rates of 85.9, 70.4, and 48.4 months for pN1-3, 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 carcinomas 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. Over the 8-year period, there was a significant rise in compliance with margin reporting from 4.7% in 1998 to 54.7% in 2006, chi-square trend test, p < 0.001. Of the 1,638 reports reviewed, factors resulting in noncompliant reporting included unoriented specimens in 37.6%, no mention of distance from negative margins in 42.3%, and complete omission of margin status report in 28.5%. 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.
Radioactive Seed-Localization for Nonpalpable Breast Lesions: Review of 1,000 Consecutive Procedures at a Single Institution

Matthew R. McGhan, Barbara Puchalski, Nadir Walid, Marina Grussenhoven, Richard Gray
Abraham Medical Associates, Westfield, NJ, USA

Objective: The purpose of this study was to review and report on our experience with radioactive seed localization in 1,000 consecutive patients from January 2003 through October 2010. We sought to evaluate our experience with this technique and to analyze the results of patients treated using seed localization.

Methods: A retrospective review of all patients undergoing radioactive seed localization at our institution was performed. A total of 1,000 consecutive patients were included in this study. The results were analyzed using standard statistical methods.

Results: One thousand breast lesions were successfully localized in 978 patients; 21 patients had >1 RL procedure. Mean patient age was 55.8 ± 10.9 years. The majority of patients had invasive ductal carcinoma (52%), in situ carcinoma (22%), atypical epithelial hyperplasia (11%), and uncertain/suspicious percutaneous biopsy findings (5%). The mean patient body mass index was 32.7 ± 7.1 kg/m². A total of 20,750 seeds were placed. All seeds were placed using digital guidance using ultrasound (61%) or mammography in 59%. The majority of RL procedures (97%), 76% involved seed localization (≤1 day prior to surgery). All target lesions were successfully excised and all seeds were recovered at the time of surgery. Intraoperative re-evaluation of the excised specimen was performed in 6% of patients. Positive margins comprised 19% of the re-excised specimens. Close margins (≤2 mm) were identified in 8% of patients. Most patients had negative margins (96%), with no difference in the rate of delayed wound healing, infection, hematomas, seromas, or surgical re-operation. Postoperative complication rates, including infection (requiring intravenous antibiotics), delayed wound healing, poor wound healing or necrosis, may also contribute to postoperative complications, such as hematomas, seromas, and poor wound healing or necrosis. This study demonstrates that using tumescent solution are independent risk factors for minor mastectomy flap necrosis (odds ratio [OR], 3.38; 95% confidence interval [CI], 1.76–6.07; p = 0.0004; and OR, 3.63; 95% CI, 1.84–6.99; p < 0.0001, respectively).

Conclusions: Radioactive seed-localization is a safe and effective procedure that is easy to learn, associated with a lower incidence of positive/close margins than previously reported for wire localizations. We believe RSL should be considered as the method of choice for preoperative localization of nonpalpable breast lesions.

The University of Pittsburgh Medical Center (UPMC) Cancer Registry and radiology database were searched for patients with a diagnosis of breast cancer who underwent seed localization and MRI staging between January 2004 and January 2009. Data obtained included demographic data, clinical, radiologic and pathologic staging, and histologic and surgical treatment data, and outcomes/covariables. We used this data to compare radiologic to pathologic staging based on largest dimension of tumor measured by MRI or H&E histology, respectively and to stratify the differences in staging based on tumor biology. Accuracy of MRI in predicting pathologic tumor size post chemotherapy was compared among tumor subtypes using one-way ANOVA and two-tailed test.

Results: Five hundred ninety-two patients underwent surgery at UPMC for a malignant tumor of the breast after surgery. All target lesions were successfully excised and all seeds were recovered at the time of surgery. Intraoperative re-evaluation of the excised specimen was performed in 6% of patients. Positive margins comprised 19% of the re-excised specimens. Close margins (≤2 mm) were identified in 8% of patients. Most patients had negative margins (96%), with no difference in the rate of delayed wound healing, infection, hematomas, seromas, or surgical re-operation. Postoperative complication rates, including infection (requiring intravenous antibiotics), delayed wound healing, poor wound healing or necrosis, may also contribute to postoperative complications, such as hematomas, seromas, and poor wound healing or necrosis. This study demonstrates that using tumescent solution are independent risk factors for minor mastectomy flap necrosis (odds ratio [OR], 3.38; 95% confidence interval [CI], 1.76–6.07; p = 0.0004; and OR, 3.63; 95% CI, 1.84–6.99; p < 0.0001, respectively).

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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 not negative margins and also underwent re-excision were included in the analysis. Margin index was calculated as follows: margin index = closest margin (mm)/tumor size (mm) x 100. A receiver operating curve was created using the derived margin index and the presence or absence of residual disease in the reexcision 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 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 <5 resulted in a sensitivity of 79% but a specificity of only 45%.

Control groups. In the absence of a reliable method for predicting 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.

### 1702 An Effective Intervention for Improving Symptoms and Quality of Life of Female Cancer Survivors: A Randomized, Controlled Study

Jennifer K Litton, 1 Marilyn & Walter J. Wolpin 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 Hospital, 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 be beneficial in improving physical and emotional outcomes, 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 of female, predominantly breast, cancer survivors utilizing standardized measures.

Methods: Sixty-eight female cancer patients, 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 of Stress Questionnaire (QLQ-C30). Participants were randomized into intervention or wait-list control groups. Intervention group participants attended 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. Results: The major cancer type represented was breast cancer (table). The intervention group (n = 48) and control group (n = 20) did not differ in mean age (57.7 years, p = 0.85) or years since diagnosis (3.9, p = 0.86). The intervention group improved significantly on the EORTC (p = 0.005), on six of the eight SOSI subscales (p ≤ 0.049), and on both SCL-90-R subscales (p ≤ 0.023), while the control group did not improve on any of these measures (p > 0.2).

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

### 1661 Margin Index Is Not a Reliable Tool for Predicting Residual Disease

After Breast-Conserving Surgery for DCIS

Carla Fisher1, V Suzanne Kimberg2, Feng Gao3, Julie Margenthaler3

1Washington University School of Medicine, St. Louis, MO; 2University of Arkansas for Medical Sciences, Little Rock, AR

**Objective:** Our group has previously shown that in patients with stage I-II breast cancer, margin index is a reliable method of predicting residual disease after attempted breast conserving therapy (BCT) with close margins. In this study, we sought to apply the margin index to patients with stage 0 ductal carcinoma in situ (DCIS) to determine its reliability in predicting residual disease in the re-excision specimen.

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 not negative margins and also underwent re-excision were included in the analysis. Margin index was calculated as follows: margin index = closest margin (mm)/tumor size (mm) x 100. A receiver operating curve was created using the derived margin index and the presence or absence of residual disease in the reexcision specimen. Sensitivity and specificity were calculated at various margin indices to determine the optimum margin index.

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

### 1698 Triple-Negative Breast Cancer Is Not a Contraindication for Breast Conservation

Farrell C Adkins, Ana Maria Gonzalez-Angulo, Xiudong Lei, Leonel F Hernandez-Aya, Jennifer X Litton, Funda Merci-Bernstam

The University of Texas MD Anderson Cancer Center, Houston, TX

**Objective:** Triple-negative breast cancer (TNBC) is an aggressive subtype characterized by a lack of hormone receptors (ER and PR) and HER2 overexpression, and has been shown to have a higher rate of locoregional recurrence (LRR) compared to other tumor subtypes. The purpose of this study was to determine the impact of operation type (breast-conserving therapy [BCT] versus mastectomy) on locoregional recurrence in triple-negative breast cancer patients.

Methods: One thousand three hundred twenty-nine patients with TNBC who underwent primary treatment with either BCT or mastectomy between 1980 and 2007 at a major cancer center were included in the study. Clinical and pathological factors were compared using chi-square test, and LRR-free, distant metastasis-free (DMFS), and overall survival (OS) were estimated by Kaplan-Meier methods. Multivariable analysis was performed using Cox proportional hazards models.

Results: BCT was performed in 653 (49.1%) patients and mastectomy was performed in 676 (50.9%) patients. There were no significant differences in age, menopausal status, nuclear grade, or resection margin status between the two groups. The mastectomy group had significantly larger tumors, a higher incidence of lymphovascular invasion, and a higher pathological stage (all p < 0.001). At a median follow-up of 80 months, 373 women had died and 273 were lost to follow-up. The 5-year LRR-free survival rates were significantly higher in the BCT group (76% vs 71%, p = 0.032), as was DMFS (68% vs 54%, p < 0.0001) and OS (74% vs 63%, p < 0.0001). On multivariable analysis, a margin index of 5 (95% CI 2.3-8.2; p = 0.002), lymphovascular invasion (HR, 1.93; 95% CI 1.54-2.42; p = 0.0001), close/positive resection margin (HR, 1.89; 95% CI 1.37-2.6; p = 0.0001), T stage, and hormone receptor status were univariately associated with the risk of locoregional recurrence (LRR). On multivariable analysis, close/positive resection margin (HR, 1.89; 95% CI 1.37-2.6; p = 0.0001), high nuclear grade (HR, 1.92; 95% CI 1.28-2.89; p = 0.002), lymphovascular invasion (HR, 1.93; 95% CI 1.54-2.42; p = 0.0001) all increased the risk of LRR while age > 50 was protective (HR, 0.75; 95% CI 0.58-0.92; p = 0.007). Operation type (mastectomy vs BCT, HR, 1.07; 95% CI 0.86-1.34; p = 0.55) did not have a significant impact on the risk of LRR.

Conclusions: Patients with TNBC have a high risk of LRR. BCT is not significantly associated with increased LRR rates compared to mastectomy; therefore, TNBC should not be considered a contraindication for breast conservation. Novel strategies are needed to decrease LRR rates in TNBC.
Scientific Poster Forum Presentations

1701
Serum 25-Hydroxyvitamin D and Prognostic Tumor Characteristics in Breast Cancer Patients
Aaron Rickles1, Luke Peppone1, Alissa Huston3, Kenneth Piazza2, 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 DX score, 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>Optimal (&gt;32 ng/ml)</th>
<th>Suboptimal (&lt;32 ng/ml)</th>
<th>% Odds Ratio* 95% Confidence Interval P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>68</td>
<td>52.7%</td>
<td>61</td>
</tr>
<tr>
<td>非-Caucasian</td>
<td>5</td>
<td>22.2%</td>
<td>17</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 and younger</td>
<td>20</td>
<td>57.7%</td>
<td>33</td>
</tr>
<tr>
<td>&gt;50</td>
<td>35</td>
<td>51.4%</td>
<td>24</td>
</tr>
<tr>
<td>Menopausal Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postmenopausal</td>
<td>65</td>
<td>65.1%</td>
<td>53</td>
</tr>
<tr>
<td>Premenopausal</td>
<td>9</td>
<td>26.5%</td>
<td>25</td>
</tr>
<tr>
<td>ER Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>64</td>
<td>50.6%</td>
<td>63</td>
</tr>
<tr>
<td>Negative</td>
<td>8</td>
<td>52.0%</td>
<td>17</td>
</tr>
<tr>
<td>Triple Negative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>53</td>
<td>58.6%</td>
<td>56</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>27.0%</td>
<td>13</td>
</tr>
<tr>
<td>Gene Expression</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Luminal A</td>
<td>61</td>
<td>50.0%</td>
<td>43</td>
</tr>
<tr>
<td>Luminal B</td>
<td>13</td>
<td>66.1%</td>
<td>13</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>Race</th>
<th>% Suboptimal (&lt;32 ng/ml)</th>
<th>% Odds Ratio* 95% Confidence Interval P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Caucasian</td>
<td>68</td>
<td>52.7%</td>
</tr>
<tr>
<td></td>
<td>Non-Caucasian</td>
<td>5</td>
<td>22.2%</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>50 and younger</td>
<td>20</td>
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<td></td>
<td>&gt;50</td>
<td>35</td>
<td>51.4%</td>
</tr>
<tr>
<td></td>
<td>Menopausal Status</td>
<td>Postmenopausal</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Premenopausal</td>
<td>9</td>
<td>26.5%</td>
</tr>
<tr>
<td></td>
<td>ER Status</td>
<td>Positive</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Negative</td>
<td>8</td>
<td>52.0%</td>
</tr>
<tr>
<td></td>
<td>Triple Negative</td>
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<td>53</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>6</td>
<td>27.0%</td>
</tr>
<tr>
<td></td>
<td>Gene Expression</td>
<td>Luminal A</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Luminal B</td>
<td>13</td>
<td>66.1%</td>
</tr>
<tr>
<td></td>
<td>Basal-like</td>
<td>4</td>
<td>26.7%</td>
</tr>
</tbody>
</table>

*Adjusted for age, race, and month of blood draw
Poster Presentations
Compromised Margins Following Mastectomy for Stage I-III Breast Cancer
Fatema Al Mushawab, Rebecca LaF, William E Gillanders, Timothy J Eberlein, Julie A Margenthaler
Wheaton 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 patients undergoing mastectomy. The current study attempted to address the difficulty in determining 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 240 patients from our prospectively maintained surgical database with stage I-III 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 focially 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-III breast cancer treated during the study period, 240 (39%) underwent mastectomy. Of the 240 patients, 132 (55%) had a simple mastectomy with sentinel lymph node biopsy and 108 (45%) had a modified radical mastectomy. The positivity rates of positive margins with selective mastectomy were 11% and 18%, respectively (p = 0.0003). Thirty-five patients (14%) had an increased adjuvant chest wall irradiation. There were no differences between patients who had a deep 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 had experienced 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.

The Effect of Margin Status on Local Recurrence After Mastectomy
Ruth Shinn, PhD, Rofi Ebeling, MD, BS
University of Wisconsin, Madison, WI

Objective: To determine the role of margin status on local recurrence after mastectomy.

Methods: A retrospective review was performed of all mastectomy patients treated at our institution from 1999-2009. Data included patient demographics, tumor characteristics, positive margin status, and local recurrence. Positive margin status was defined as any microscopic or macroscopic positive margin. Patients were followed for a median of 7 years (range 1-10). Local recurrence was defined as any recurrence that occurred in the chest wall or axilla. 

Results: Of 408 mastectomy patients, 56 (14%) had positive margins. Of these, 43 (77%) had local recurrence within 5 years of diagnosis. The 5 year local recurrence rate for patients with positive margins was 39% (95% CI: 27-51) compared to 24% (95% CI: 18-31) for patients with negative margins. 

Conclusions: Positive margin status is a significant risk factor for local recurrence after mastectomy. Patients with positive margins should be closely monitored for local recurrence.

Poster Presentations
1660

Sentinel Lymph Node Biopsy in Patients Undergoing Neoadjuvant Chemotherapy

Janani Arun, Carol Reynolds, James W Jakub, Amy C Degnim, Judy C Boughery

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 positive SLNs following completion of neoadjuvant chemotherapy.

Methods: With IRB approval, 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 (66%). 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 cytokeratin staining in one of five 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 metastatic nodes of 4.2 mm (range, 0.1-9.8 mm). Residual tumor size in the breast was significantly larger in the node-positive patients than node-negative patients (4.1 cm vs 2.0 cm, p = 0.01). All three patients with node-positive disease at presentation were found to have positive SLNs after neoadjuvant chemotherapy and underwent completion axillary dissection with a mean of 3.67 additional positive axillary nodes (range, 1-8). The average size of lymph node 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 macrometastases 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

Mitchel Barry, Malcolm Kell

Mater Hospital University, 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 ACOSSOG, Z0011 trial, it is unclear whether patients with asymptomatic screen-detected tumors derive any benefit by undergoing an axillary clearance with its attendant morbidity. Our aim, therefore, was to evaluate the role of axillary clearance in asymptomatic screen-detected breast cancer population.

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 only those with subsequent 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 an SNB or a T3 tumor. All patients undergoing breast-conserving therapy had radiation therapy.

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 SNB. All 110 (T1 = 68, T2 = 42) patients proceeded to have an axillary dissection. Sixty-eight (59%) had T1 tumors and of these, 39 (60%), despite a positive SNB, had no metastatic nodes on final pathological analysis of their axilla. In addition, 20 (47.5%) patients with T2 tumors had no metastatic nodes except for a positive SNB. Furthermore, only 5 (7.8%) of T1 tumors with a positive SNB had 4 or more metastatic lymph nodes.

Conclusions: Of patients with a screen-detected T1/T2 tumor, 53.4% failed to derive any benefit from an axillary clearance. Moreover, 7.8% of patients with screen-detected T1 cancers harbor four or more metastatic nodes. These findings compel us to re-evaluate the role of axillary clearance in the screen-detected asymptomatic breast cancer population.

1648

Receptor Changes in Metachronous Breast Cancer—Our 10-Year Experience

Jasneet Bhullar, Linda Dubey, Lorenzo Ferguson, Yousif Goriel, Sumet Silpapajan, Vijay Mittal

Providence Hospital and Medical Centers, Southfield, MI

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 metastatic 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 metastatic 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 metastatic tumors. Only three converted from ER- to ER+, and four converted from PR- to PR+. 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 Her2+ 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 tumors Her2 expression was lost in metachronous tumors most probably due to Herceptin therapy. Metachronous tumors are less likely with ER-/PR- primary tumor.
1462 Sentinel Lymph Node Biopsy in Pure DCIS: Is it Necessary?

Julie AY Billar, Amylou C Dueck, Richard J Gray, Nabil Wasif, Barbara A Pockaj

1Lehigh Valley Health Network, Allentown, PA, 2Muhlenberg College, Allentown, PA, 3Mount Nittany Medical Center, State College, PA

Objective: Sentinel lymph node biopsy (SLNB) in patients with pure DCIS has been a matter of debate. In the present study, we aim to identify factors in a single institutional series to select patients who may benefit from SLNB.

Methods: Of 637 patients with breast cancer between July 2000 and July 2010, 62 patients (9.7%) diagnosed with pure DCIS or DCIS associated with microcalcification were reviewed. All the sentinel lymph nodes were examined by serial sectioning (>50 μm) of the entire lymph node and H&E staining, and by cyto-keratin immunostaining in suspicious cases.

Results: Of 62 patients, 57 patients (92%) were found to have pure DCIS, and 5 (8%) had microsaccule disease associated with DCIS. Median age was 51 (range, 30-79). Of patients with pure DCIS, mastectomy was performed in 28 patients (49%), whereas 29 patients (51%) underwent breast-conserving surgery. Thirty-six patients (63%) with pure DCIS underwent SLNB, and 3 of them had a positive SLNB. Of patients with SLNB positivity, two patients (6%) were found to have isolated tumor cells (ITCs), whereas one patient had macrometastasis (2.8%). Axillary lymph node dissection was performed in one patient with ITC, and in one patient with macrometastases. In all three cases with SLNB metastases, only one sentinel 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 mastectomy due to extensive disease. Other factors, including age ≥50, estrogen or progesteron receptor status, or eorst-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 examination of SLNB by serial sectioning technique or due to our patient selection criteria or both. Although the importance of presence of ITC in SLNs has not been clarified yet, it may be reasonable to perform SLN in selected patients with pure DCIS.

1646 Can Surgeons Avoid Preoperative Wire Localization Using Sonographically Visible Breast Biopsy Marker Clips?

Kristine Calhoun1, Peter Eby2, Benjamin Anderson,1 Gary Mann1, David Byrd2, Brenda Kurland3, Wendy Gutierrez1,2

1University of Washington, Department of Surgery, Seattle, WA, 2University of Washington, Department of Radiology, Seattle, WA, 3Fred Hutchinson Cancer Research Center, Department of Clinical Statistics, Seattle, WA

Objective: Preoperative wire localization to guide resection of nonpalpable breast lesions is resource-intensive. We assessed if collagen-based marker clips placed at biopsy are detectable by surgeons before and during surgery using 2D ultrasound, if target visibility is enhanced using 3D ultrasound, and if ultrasound visibility impacts final surgical margin adequacy.

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

Results: There were 25 patients with 26 lesions. Twelve (12 of 18 [67%]) who underwent lumpectomy had 2D ultrasound clip visibility rated 4 or 5 preoperatively, whereas 6 of these 12 (50%) also had adequate clip visualization intraoperatively. There were 9 patients who underwent mastectomy who had 2D visibility rate of 4 or 5 preoperatively that also had clip and/or lesion visibility rated 4 or 5 at surgery. Surgeons consistently rated clip and lesion visibility better with 2D than with 3D ultrasound (p < 0.01). Of 44 paired 2D and 3D clip assessments, 3D visibility was better by 1 rank level in 4 cases, but 2D was better by 1-5 levels in 17 (39%). For lesions, 3D visibility was better by 1 rank level in 2 cases, but 2D was better by 1-2 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: Intuitive surgeon-directed ultrasound target localization may be feasible in patients with adequate preoperative visualization of both marker clip and lesion. The addition of 3D 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: 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) were compared to the final pathological report were analyzed. DCIS was considered as a positive pathological 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 83%. When these methods are combined, the overall NPV 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 pCR as the NPV was less than 50%. In younger patients the accuracy and NPV were compromised even further.

Table 1. BRCA Testing by Specialty–A Regional Review

<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>
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<tr>
<td>Overall PPV</td>
<td>87</td>
<td>82</td>
<td>85</td>
<td>77</td>
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<tr>
<td>Overall NPV</td>
<td>28</td>
<td>30</td>
<td>33</td>
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</table>

Accuracy, PPV, and NPV of exam method relative to the final pathology.
1695
correlation of ductal lavage cytology with ductoscopy-directed duct excision histology in women at high risk for developing breast cancer: a prospective single-institutional trial

Amy E Cyr1, Julie A Margenthaler1, Antonella L Rastelli1, Rosa M Davila2, Feng Gao1, Jill R Dietz3

1Washington University, St. Louis, MO, 2Mississippi Baptist Medical Center, St. Louis, MO, 3Cleveland Clinic, Cleveland, OH

Objective: Monitoring patients at high risk for developing breast cancer is limited to physical exam and imaging. Ductoscopy with ductal lavage allows visualization and cytologic evaluation of the epithelium at risk. We aim to determine: whether histologic lesions produce cellular atypia in lavage specimens, and whether ductoscopy adds useful information for the evaluation of high-risk patients with atypical ductal cytology.

Methods: 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 carcinoma in situ or atypical ductal hyperplasia (ADH), BRCA1 or BRCA2 carrier status, or a 5-year breast cancer score of ≥7.1%. 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, 13-73) with a median follow-up of 80 months (range, 5-90). Overall, 27 (26%) had atypical ductal 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 carcinoma in situ (DCIS) in 3 (11%). At follow-up, three patients developed breast cancer, including one Group 1 patient with atypical ductal 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.

1754
mammography in 40-year-old women: what difference does it make? the potential impact of the u.s. preventive services task force uspstf mammography guidelines

Paul Dake, Nicole Jondeau, Dainel Miller, Rebecca Dworkin, Mina Ansarin-Cornell, University of Missouri-Columbia, Columbia, MO

Objective: Recent, the U.S. Preventive Services Task Force (USPSTF) mammography Guidelines published in 2009.

Methods: We enrolled 102 women; 93 (91%) were Caucasian. Their median age was 49 years (range, 34-73) with a median follow-up of 80 months (range, 5-90). Overall, 27 (26%) had atypical ductal 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 carcinoma in situ (DCIS) in 3 (11%). At follow-up, three patients developed breast cancer, including one Group 1 patient with atypical ductal 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.

1753
correlation of the mammprint 70-gene expression profile with clinical parameters in patients with breast cancer: findings from a united states cohort

Kendrick Ock, Debrah Awad, Silvia Formenti, Silvia Formenti1, Amy E Cyr1, Julie A Margenthaler1, Antonella L Rastelli1, Rosa M Davila2, Feng Gao1, Jill R Dietz3

1New York University School of Medicine, New York, NY, 2Amrita Institute of Medical Sciences & Research Centre, Kochi, India, 3University of Stellenbosch, Tygerberg, South Africa

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, Adami et al reported a 34% pathological response among 156 patients with LABC treated with taxane-based, preoperative chemotherapy; 5-year DFS and OS results were comparable to those of many more aggressive chemotherapy regimens in the neoadjuvant setting. As for patients treated by neoadjuvant chemotherapy, the achievement of a pathological response to chemoradiation reflected better DFS and OS. Importantly, a pathological 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-IIIb), ECOG performance status of 0 to 1, were eligible. Patients were treated with paclitaxel (30 mg/m2) intravenously twice a week for 6-2 weeks. Daily radiotherapy was delivered to breast, axillary, and supracrural lymph nodes during 2-7 of paclitaxel treatment, at 1.8 Gy per fraction to a total dose of 45 Gy at a tumor boost of 14 Gy at 2 Gy/fraction. Seventeen of 63 patients received four cycles of doxorubicin 60 mg/m2 and cyclophosphamide 600 mg/m2 prior to the paclitaxel-IT regimen. Mastectomy or lumpectomy, as decided by each surgeon, was performed 4 weeks after completion of preoperative therapy or upon recovery of chemoradiation-induced dermatitis. All patients had a level I1 axillary lymph node dissection. Postoperatively, patients who responded to paclitaxel and RT were assessed for correlation with risk of distant recurrence, whereas patients who did not respond received docetaxel/cisplatin. Surgical complications were recorded.

Results: Forty-three patients underwent modified radical mastectomy and 20 underwent lumpectomy. Mastectomy patients, 17 (39.5%) underwent immediate breast reconstruction: free flap reconstruction (8), pedicle flaps (3), advancement flaps (2), tissue expander placement (2), and major chest wall and sternal reconstruction (1). Of lumpectomy patients, 5 (25%) had further surgery for positive margins, a second lumpectomy (3), and a mastectomy (2). All revealed residual disease and negative margins were achieved. Twenty-one patients had at least 1 complication of whom 17 were treated as outpatients. Eleven (17%) had a recurrent hernia, 8 (12.7%) had delayed healing, and 7 (11.1%) developed a postoperative infection.

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 related to immediate breast reconstruction. Delayed reconstruction may be advisable for patients treated with neoadjuvant chemo-radiation.

Table 1: Correlation of the Mammprint 70-gene expression profile with clinical parameters in patients with breast cancer: findings from a United States cohort

<table>
<thead>
<tr>
<th>Parameter</th>
<th>n</th>
<th>Mammprint score</th>
<th>Surgery type</th>
</tr>
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<tbody>
<tr>
<td>Age</td>
<td>65</td>
<td>70.32</td>
<td>44.55</td>
</tr>
<tr>
<td>Tumor size</td>
<td>45</td>
<td>69.12</td>
<td>43.69</td>
</tr>
<tr>
<td>Node status</td>
<td>30</td>
<td>70.23</td>
<td>45.62</td>
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<tr>
<td>PR status</td>
<td>50</td>
<td>70.32</td>
<td>44.55</td>
</tr>
<tr>
<td>HER2 status</td>
<td>35</td>
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<tr>
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<tr>
<td>DFS</td>
<td>80</td>
<td>70.32</td>
<td>44.55</td>
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</table>

Poster Presentations
1638 A Positive Intramammary Lymph Node Does Not Mandate a Complete Axillary Node Dissection Ricardo Díaz
Mayo Clinic, Rochester, MN

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 avoided.

Methods: A comprehensive search of the available English literature was performed to identify published reports of positive IMLNs and SLN biopsy. A total of 386 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.

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. In 21 cases, the CALND was negative and the status of the axilla was re-evaluated. In all 24 cases, the CALND was negative. Three 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: This 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.

1630 Modern Surgical Approach to Paget Disease
Laura Domicino, 1 Susan Lester, 2 Lei Guo, 3 Michelle Specht, 2 Barbara Smith, 2 Mehra Golshan 1
1 Brigham and Women's Hospital, Boston, MA; 2 Massachusetts General Hospital, Boston, MA

Objective: Paget's disease (PD) constitutes between 1 and 3% of all breast malignancies. The small number of cases prevents comparison of surgical outcomes. The purpose of this analysis was to assess whether patients with Paget's disease have the same outcomes as those with breast cancer.

Methods: Patients were identified from 3754 cases of breast cancer. A total of 51 breast cancer patients with Paget's disease were identified. Our institution’s database was searched for patients with Paget’s disease and breast cancer. Patients were identified with Paget’s disease through radiological, clinical, or pathological criteria. Patients were included in the analysis if they had a breast malignancy diagnosed, if the diagnosis was confirmed at our institution, and if the patient underwent surgery. Patients with Paget’s disease were categorized into either breast conserving or mastectomy. Breast conservative procedures were defined as removal of the nipple and surrounding breast tissue. The breast was removed if larger than the nipple. The status of the chest wall, axilla, and skin was documented for each patient. Each patient was included in the final analysis if they underwent surgery for Paget's disease and had follow-up data.

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. While 32 patients (63%) underwent mastectomy. Successful breast conservation was achieved in patients without a palpable finding, a benign mammogram, and normal MRI. No local or regional recurrences were noted in this cohort of patients with breast conservation.

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 noted in this cohort with short-term follow-up.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>PATIENT CHARACTERISTICS</th>
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<td>BREAST CONSERVATION</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>NUMBER</td>
<td>19</td>
</tr>
<tr>
<td>AG (years)</td>
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<tr>
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<tr>
<td>LOCAL-REGIONAL RECURRENCE</td>
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</tr>
<tr>
<td>DISTANCE RECURRENCE</td>
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</tr>
<tr>
<td>GRADE</td>
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</tr>
<tr>
<td>No recorded or no</td>
<td>12 (40%)</td>
</tr>
<tr>
<td>invasive disease</td>
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<td>III</td>
<td>3 (28%)</td>
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<td>0</td>
<td>10 (33%)</td>
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<tr>
<td>1</td>
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<tr>
<td>4</td>
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<td>5</td>
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<td>8</td>
<td>0</td>
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<tr>
<td>9</td>
<td>0</td>
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<tr>
<td>CIRCULATORY DISEASE</td>
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<td>CHEMOTHERAPY</td>
<td>2 (7%)</td>
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<td>TRASTUZUMAB</td>
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</table>

1650 Optimizing Outcomes in Stage 4 Breast Cancer
William Dooley
Mayo Clinic, Rochester, MN

Objective: Surgery for stage 4 breast cancer has historically been considered futile. Recent studies suggest that there may be improved survival with resection of the primary site of tumor. We embarked on this study to understand which treatments benefited which stage 4 patients.

Methods: This is an IRB-approved retrospective analysis of all stage 4 breast cancer patients who had all therapies and follow-up at a single institution from 2001-2008 inclusive. Demographics, pathology, clinical features, and prognostic and predictive factors were recorded. The primary endpoint was survival. Three disease groups were defined: localized, metastatic, and systemic. Each group was subdivided into the initial and follow-up stages. Each group was subdivided into the initial and follow-up stages. Each group was subdivided into the initial and follow-up stages.

Results: In this interval, 122 stage 4 patients were treated with an average age of 56 and mean follow-up of 36 months. Of the 24 patients who refused therapy, the average age was older (62). Of the 98 patients who received therapy, the average age was 55. The majority of patients were treated with chemotherapy (76), followed by hormone therapy (30) and surgery (26). The median overall survival was 36 months. Of the 24 patients who refused therapy, the average age was older (62). Of the 98 patients who received therapy, the average age was 55. The majority of patients were treated with chemotherapy (76), followed by hormone therapy (30) and surgery (26). The median overall survival was 36 months.

Conclusions: Effective systemic therapy followed by surgical ablation of the primary site and maintenance therapy is associated with best outcomes for stage 4 breast cancer patients at our center. Multi-institutional trials are needed to determine if this approach is ideal for those with acceptable performance status and truly offers improved palliation and survival.

1678 Upper Extremity Lymphedema Rates Following Surgery for Breast Cancer
Kara E Downs, Sameer Darllo, Anita M McSwain, Brettia Fabian, Christine T Teal
Dr. Joseph F. McCorkle Comprehensive Cancer Center, Department of Surgery, George Washington University, Washington, DC

Objective: Lymphedema (LE) is a known complication following axillary surgery for breast cancer. Studies have shown significantly lower rates of LE following sentinel lymph node biopsy (SLNB) compared to axillary lymph node dissection (CALND). The American Society of Clinical Oncology (ASCO) defined LE as a 2 cm or greater increase in circumference around the arm in the supraventricular fossa. The purpose of this study was to compare volumetric measurements used by a lymphedema specialist to circumferential measurements used by a surgeon for detecting clinically significant LE. This study evaluated whether patients were symptomatic with a 1 cm change in circumference.

Methods: Twenty-five of 103 breast cancer patients previously involved in a long-term follow-up study of LE were prospectively enrolled. Patients had a SLNB or ALND for breast cancer between 2005 and 2008. Bilateral arm volumes were measured using a lymphedema specialist’s protocol of 5 circumference measurements at 16-cm intervals from the ulnar styloid process. The contralateral arm served as the control arm. Subjective symptoms of LE were evaluated by a questionnaire given to patients prior to performing measurements. LE was defined as a 10% increase in arm volume, 1- or 2-cm increase in arm circumference, or at least two patient-reported symptoms.

Results: Five of 25 patients (20%) were found to have LE by a 10% volume change. One (20%) of those patients reported symptoms and was found to have an increase in arm circumference. Four patients (16%) were identified by a 2-cm increase in arm circumference of which three (75%) were symptomatic. Of the 13 patients with measurements greater than 1 cm, 6 (46%) were symptomatic. When five circumference measurements at 10-cm intervals from the ulnar styloid process were used, eight patients (32%) were found to have a 2-cm increase in arm circumference, and four (50%) were symptomatic. Of the seven symptomatic patients, 6 (86%) were identified by a 2-cm increase in arm circumference. The American Society of Clinical Oncology (ASCO) defined LE as a 2 cm or greater increase in circumference which would enable earlier intervention. Larger studies are necessary.
1744 Breast-Specific Gamma Imaging Influences Surgical Management in Patients With Breast Cancer
Claire Edwards, Anita P McSwain, Jocelyn Rapelyea, Stephanie Williams, Rachel F Brem, Christine B Tang
George Washington University Medical Center, Washington, DC

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 reported 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 from 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 had 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 result 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 (30.5%) 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. BSGI resulted in mastectomy in 6.8% of patients. The rate of additional foci of mammographically occult breast cancers identified by BSGI was slightly higher than rates previously reported for MRI. Biopsy of positive BSGI lesions 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
Carla Fisher, Julie Margenthaler
Washington University School of Medicine, St. Louis, MO

Objective: Most breast cancers originate in the ductal epithelium with normal cells progressing through atypia to use ductal carcinoma in situ. Many ductal abnormalities represent a component 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 Acuety 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 1/2 findings in 113 (93%), BI-RADS category 4 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 1/2 breast imaging. The extent of DCIS identified by ductoscopy and subsequent surgical 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 ductography in our patient cohort. The majority of patients with pathologic nipple discharge have either benign nonspecific findings or benign papillomas. 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
Carla Fisher, Fatema Al Mashawakh, Feng Gao, Julie Margenthaler
Washington University School of Medicine, St. Louis, MO

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, ultrasound-guided lumpectomy is rarely described. In this study, we describe our experience with ultrasound-guided lumpectomy for palpable breast cancers.

Methods: A total of 132 patients were considered by the breast surgeon to be eligible for breast-conserving therapy (BCT) and had BSGI. All 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 had BSGI were evaluated to determine how many ultimately had mastectomies. 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 (30.5%) 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.

Conclusion: 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 has a greater impact on 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.

1720 A Comparison of Intraoperative Versus Traditional Specimen Radiography in Patients Undergoing Breast-Conserving Surgery for Nonpalpable Breast Lesions
Mary Catherine Goodwin1, Tari S Stull1, Abigail E Colliet1, Michael R Chernick2, Andrea V Barro3, Thomas G Frazer1
1Bryn Mawr Hospital, Bryn Mawr, PA, 2Lankenau Institute for Medical Research, Wynnewood, PA

Objective: The current standard of care for specimen evaluation in breast-conserving surgery (BCS) for nonpalpable breast lesions is specimen radiography in the mammography suite. Transferring the specimen from the operating room to radiology prolongs operative time and precludes the surgeon from orienting and evaluating the specimen X-ray. By using an intraoperative specimen radiograph device, image acquisition occurs within seconds and the surgeon can orient the specimen and evaluate the specimen immediately. We hypothesized that use of the intraoperative specimen radiograph device, such as the KUBTEC, would result in fewer positive margins and decreased re-excision rates compared to traditional specimen radiography.

Methods: An IRB-approved retrospective chart review was conducted between November 2009 and August 2010. One hundred patients (pts) with high-risk or malignant breast lesions diagnosed by minimally invasive biopsy were identified. Each pt underwent BCS with preoperative needle localization of the lesion. Fifty pts had intraoperative specimen radiography performed using the KUBTEC system and 50 pts had specimen radiographs performed in Radiology (standard). Primary endpoints of the study were comparison of margin status and re-excision rates between the two groups.

Results: Both the KUBTEC and the standard group had 50 pts with each group having 52 procedures performed. Of the 52 procedures, the number of malignant and high-risk lesions were equally matched between the two groups with 12 ductal carcinoma in situ, 24 invasive ductal carcinoma, and 16 high-risk lesions. In the 39/52 (75%) procedures performed using the KUBTEC for which time was recorded, median time to image acquisition was 80 seconds (range, 40-1140 sec). Overall, there were 11/52 (21.2%) procedures in the KUBTEC group with positive margins compared to 12/52 (23.1%) in the standard group (P = .81). There was no difference in the number of additional margins taken during the first operation between the KUBTEC group and the standard group (26 vs 32, P = .23). In comparing re-excision rates, the KUBTEC group had significantly fewer re-excisions than the standard group (5.8% vs 19.2%, P = .03). The lower re-excision rate was related to a fewer number of positive radial margins in the KUBTEC group (n = 9) compared to the standard group (n = 17).

Conclusions: Intraoperative specimen radiography permits the surgeon to orient and visualize the specimen X-ray in the operating room, which allows for more selective margin excision at the first operation. Specimen evaluation in the operating room leads to fewer positive radial margins and ultimately fewer re-excisions compared to standard specimen radiography performed in the mammography suite. This, coupled with improved operative efficiency, makes intraoperative specimen radiography a new standard for specimen evaluation.
1647
Should Patients With Invasive Lobular Carcinoma Be Considered "Cautionary" for the Use of Accelerated Partial Breast Irradiation?
Mary Catherine Goodwin, Tari S Stull, Thomas G Frazier, Andrea V Barrio
Bryn Mawr Hospital, Bryn Mawr, PA
Objective: Invasive lobular carcinoma (ILC) is a well-documented subtype of breast cancer. The goal of this study was to review 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; 1 pt received APBI with 3-D conformal radiation. The end-point was the outcome for local-regional recurrence (LRR). Secondary end-point was to determine the occurrence of a local-regional recurrence. Three patients were excluded for the following reasons: breast biopsy only, negative margins at time of APBI, and imaging prior to either biopsy or additional imaging. All studies were interpreted by a breast imaging-only reader with 15 years of ultrasound experience. Criteria for performing secondary screening were defined a priori. Suspicious findings on tomographic evaluation were confirmed by focused, hand-held sonographic screening. This represents a significant advantage over mammography alone. 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.
Results: Of the 23 pts, 1 (4.2%) developed a local recurrence at 2.5 yrs. She was treated with an aromatase inhibitor and her local disease is currently stable. One pt (4.2%) developed a distant recurrence in her liver 1.1 yrs after diagnosis. Her original cancer was HER-2/Neu positive and she was originally treated with chemotherapy and herceptin.
Conclusions: In our initial cohort of pts with ILC and APBI, our local recurrence rates were low (4.2%). However, given our short median follow-up time, longer follow-up is needed to determine whether APBI is safe in this “cautionary” group of pts.

1741
Improved Cancer Diagnosis Outcomes Obtained Through Surgeon-Performed Ultrasound Screening
Ian Grady1, Heidi Gorsuch-Rafferty2, Patricia Hadley1
1North Valley Breast Clinic, Redding, CA, 2Rockingham Memorial Hospital, Harrisonburg, VA, MD Imaging, Sunnyvale, CA
Objective: Physician-performed, whole-breast ultrasound has been shown to improve the diagnostic yield of conventional mammographic screening in women who have heterogeneously dense breasts or other risk factors for breast cancer. The recent advent of diagnostic ultrasound, whole-breast ultrasound imaging has automated the process of screening and placed this capability into the hands of the surgeon.
Methods: In July 2007, we developed a surgeon-directed sonographic tomography screening program to improve diagnostic yield in a community-based breast clinic. Between July 2007 and July 2010, we performed 2190 screening tomogram studies in high-risk women with negative mammograms. All tomographic studies were performed using a Sono-V three-dimensional automated ultrasound scanner (U-Systems, Sunnyvale, CA). The entirety of both breasts and axillae were imaged. Suspicious findings on tomographic evaluation were confirmed by focused, handheld breast ultrasound imaging prior to either biopsy or additional imaging. All studies were interpreted by a surgeon reader with 15 years of ultrasound experience. Criteria for performing a sonographic screening study included heterogeneously increased breast density, a positive history of breast biopsy, or a family history of breast cancer risk of 15% or greater. This report is a retrospective review of our experience with sonographic tomography to determine diagnostic yield and false-negative rates.
Results: Two thousand one hundred ninety sonographic tomography studies resulted in a recommendation for needle biopsy in 82 women, of whom 76 underwent sampling. Cancer was diagnosed in 11 of these women. Additional imaging with MRI was recommended in 45 women, of whom 40 had the study. This resulted in 15 additional biopsies, of which 4 were positive. Diagnostic yields were 5.0 cancers/1000 women screened for tomographic screening alone and 6.8 cancers/1000 women screened for the program overall. The cancers diagnosed were 18 invasive ductal carcinomas, 3 invasive lobular carcinomas, and 2 cases of ductal carcinoma in situ. Excluding DCIS, all cancers were stage I except one invasive lobular carcinoma that was stage II. The stage II lobular was the only node-positive cancer. Median age at diagnosis was 46 (34-67). Short interval follow-up was recommended in 195 (8.9%) women and 1868 women received a recommendation for annual follow-up. To date, one interval cancer has been detected. False-positive findings occurred in 112 (4.1%) women with ILC treated with BCS and APBI. 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 CoC Registry has not yet been ideal for contributing hospital registries, it is intended that the registry will be approved for data collection in the near future.

1719
Assessing the Ability of a CoC-Accredited Hospital Tumor Registry to Provide Recurrence and Survival Data
Meghan Hahn, Martin Rosman, Charles Mylander, Jane Rhule, Lorraine Tafra
Anne Arundel Medical Center, Annapolis, MD
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 diagnosis and recurrence data and survival data to Meditech database, (2) review methods of collecting and recording disease follow-up to evaluate effectiveness and accuracy of these processes, and (3) assess the usability of CR breast 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 breast cancer before June 1, 2010. Patients meeting criteria were obtained through Meditech database search for patients having breast cancer diagnosis data 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 confirmed by chart review. Inclusion and inclusion exclusion criteria were submitted to CR to obtain the most recent registry data. 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 disease information on recurrence type or location. CR recorded a DR code matching the first DR code matching the first DR code matching the first recorded in Meditech for 37% of cases. DR codes appear in CR with significantly less frequency than they do in Meditech, indicating numerous case findings were used in 37% of cases. Meditech codes do not have corresponding coding in CR. Based on our findings, 57% of patients were inaccurately assessed.
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 is 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 clinical outcomes and quality improvement research. Modification to these CoC standards would drastically improve registries’ ability to capture current breast cancer treatment and research.
1764
Local Recurrence of Ductal Carcinoma In Situ After Mastectomy: Does Resection Margin Status Matter?
Joyce Ho
City of Hope National Medical Center, Philadelphia, PA
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 (30-88). 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 undergone prior excisional biopsies 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 distant 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) 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.

1619
BRCA Mutations and Variants in Young Asian Women at Risk of Hereditary Breast Cancer
Ashley Hodes, Margaret Chen
New York Hospital Queens, New York, NY
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. Each group, however, had different types of mutations without overlap. The number of women with breast cancer at the time of genetic testing was: Caucasian, 65 (51.2%); Asian, 51 (72.9%); Black, 19 (70.4%); and other race /ethnicity, 21 (52.5%); p = 0.0117. The mean±SD age of onset of breast cancer was 43.8 ± 8.3 in Asians and 48.9 ± 10.5 in Caucasians, p = 0.0085.

Conclusions: The frequencies of BRCA1 and BRCA2 mutations and variants were comparable in Asians and Caucasians, although specific mutations were different. Fewer Asians had genetic screening prior to developing breast cancer, and Asians with breast cancer were younger compared to Caucasians. Further education about genetics and breast cancer risks is needed to overcome screening barriers.

1748
Does Mode of Presentation Affect the Need for Chemotherapy in 40- to 49-Year-Old Breast Cancer Patients?
Lisa Hopkins, Sumy Chang, Laurie Kirstein, Tamara Fulop, Susan Boobloth
Beth Israel Medical Center, New York, NY
Objective: In November 2009, the United States Preventive Services Task Force (USPSTF) released new guidelines reversing the recommendation for screening mammography to begin in the average-risk women at the age of 40. This was based on mortality data and a risk/benefit analysis, but did not take into account the financial, personal, and social burden of adjuvant treatments, including chemotherapy. We previously demonstrated that in our population a breast cancer patient age 40-49 is 3.2 times more likely to have early-stage disease if detected by mammogram rather than as a palpable mass. In this study, we sought to examine the relationship between mode of presentation and need for chemotherapy in this same age group.

Methods: A prospective database was reviewed to identify patients ages 40-49 with invasive or in situ 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.

1667
Is Intraoperative Imprint Cytology Evaluation Still Feasible for the Evaluation of Sentinel Lymph Nodes for Lobular Carcinoma of the Breast?
Marissa Howard-McNatt, John H Stewart, Perry Shen, Kim R Geisinger, Edward A Levine
Wake Forest University School of Medicine, Winston-Salem, NC
Objective: The evaluation of sentinel lymph nodes (SLN) from a patient with lobular breast cancer is challenging. Metastatic lobular cancer is difficult to identify in SLN due to its low-grade cytomorphology and its tendency to resemble lymphocytes. Intraoperative imprint cytology (IIC) is a rapid, reliable method for evaluating SLN intraoperatively. We sought to reexamine our experience with this technique in the identification of lobular breast cancer SLN metastases.

Methods: A retrospective review of a prospectively maintained database of IIC results of 1010 SLN mapping procedures for individual breast cancer patients was performed. From this cohort we reviewed SLN cases of lobular cancer. The SLN were evaluated intraoperatively by biocorticating the SLN, Imprints were made of each cut surface and stained with hematoxylin and eosin and Diff-Quik. Permanent sections were evaluated with up to four hematoxylin and eosin-stained levels and cyto-keratin immunohistochemistry. IIC results were compared with final pathologic results.

Results: Sixty-seven cases of pure invasive lobular cancer were identified. The sensitivity was 71%; specificity, 100%; and accuracy, 92%. 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.

Conclusions: As we have previously shown, the sensitivity and specificity of IIC in evaluating lobular carcinoma is feasible and accurate. IIC continues to be a viable alternative to frozen section for intraoperative evaluation.
**1696**

**Features Associated With Abnormal Axillary Ultrasound in Breast Cancer**

Jennifer E Joff, Gang Han, John Kluk, Christine Laronga, Nazaren Khakpour, M Catherine Lee

**University of Arkansas for Medical Sciences, Little Rock, AR**

**Objective:** To determine clinicopathologic features predictive of an abnormal axillary ultrasound (AUS) and/or positive axillary lymph node fine needle aspiration (FNNA).

**Method:** A single-institution database of newly diagnosed breast cancer patients was reviewed and correlated to AUS and FNNA. Patient demographics, clinicopathologic features, and results of axillary staging were correlated to AUS and FNNA. Univariable logistic regression and Spearmann’s and Kendall’s Tau B correlation coefficients were computed to identify features that had a significant relationship with AUS (normal/abnormal) or FNNA (positive/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, 0.6-33). 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. FNNA was performed in 247 cases, of which 167 (67.6%) were positive. One hundred forty-six sentinel lymph node specimens (46.6%) and 206 complete axillary 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 56.1% and specificity of 100% for nodal disease. The false-positive rate for an abnormal AUS in tumors with IDC histology was 18.4% (95% CI, 13.5-24.5) compared to 33.5% (95% CI, 14.4-58.5) with ILC histology. One hundred forty-one tumors (45%) had associated palpable axillary adenopathy; this was significant in the logistic regression model for both abnormal AUS and positive FNA (p values < 0.05). There were statistically significant positive correlations between tumor grade, clinical stage, clinical TNM staging, IDC histology, and inflammatory breast carcinoma to both AUS and FNA (p values < 0.05). ILC histology did not correlate with either abnormal AUS or positive FNA. Lymphovascular invasion correlated with a positive FNA (p value = 0.01) but not with an abnormal AUS (p = 0.3). Although not associated with a positive FNA (p value = 0.74), progesterone receptor negative disease was associated with an abnormal AUS (p value = 0.04).

**Conclusions:** AUS is an effective tool for preoperative staging in breast cancer. There are multiple clinicopathologic features that may guide judicious application of AUS.

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**1718**

**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 purpose of this study was to examine the utility of imaging axillary specimens with x-ray (ASX) to determine the number of lymph nodes retrieved and the potential use of ASX in guiding planning of axillary lymphadenectomy. Furthermore, we sought to determine the sensitivity and specificity of ASX in identifying nodal positivity.

**Methods:** Patients undergoing SLN and ALND were prospectively accounred to this double-blinded, single-institution trial from 12/2009 until 9/2010. Ex vivo specimens magnified plain film x-ray views were performed on all axillary tissue removed (ASX). A single physician interpreted all radiographs independently 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, 50.8 ± 14.8) 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%). In 3 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 7 (range, 0-28). 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. Seven specimens were from patients who did not receive preoperative chemotherapy and averaged 13.3 ± 6.2 nodes on final pathology. In patients who had not had a recent biopsy (neoadjuvant patients), sensitivity of ASX to detect nodal positivity was 87.5% and specificity was 75%.

**Conclusions:** This study demonstrated that ASX accurately identifies nodal count. This can be used for documentation of an adequate ALND as well as GPS. In addition, ASX is an inexpensive method of identifying nodal positivity.

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**1727**

**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**

Mohammed Kashira1, Norman Williams2, Tammy Corica3, Christobel Saunders2, David Joseph2, on behalf of the TARGIT Trialists’ Group

1Royal Free Hospital, London, UK, 2University College London, London, UK, 3St. Charles Girinder Hospital, Perth, Australia

**Objective:** The international randomized TARGIT Trial started accrual in 2000 to determine if there is non-inferiority of TARGIT (using the Intrabeam® [Carl Zeiss, Germany]) and conventional external beam radiotherapy (EBRT) in women with early, low-risk breast cancer suitable for breast conservation as primary treatment. The main outcome was the 3-year composite score of cosmesis, as determined by a subprotocol assessing cosmesis in a subset of 114 women over 52 participating in the TARGIT Trial from one center (Perth, Australia).

**Methods:** Digital photographs from 115 patients (95 TARGIT, 55 EBRT) taken at baseline and 1 year after completion of breast-conserving surgery were assessed blinded to randomized treatment using specialist software (BCCCT 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 died of breast cancer. The composite scores were combined into excellent/good (IG) and fair/poor (FP) cosmetic outcome. On average, 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 74.6% (SE 5.7%) and 56.4% (SE 6.7%) had achieved EG cosmesis in the TARGIT and EBRT groups, respectively.

**Conclusions:** These results indicate that the cosmetic effects of targeted radiotherapy using Intrabeam® are significantly improved compared to those obtained with conventional EBRT, particularly 1 year after surgery.

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**1705**

**Presentation of Metachronous Breast Cancer: The Importance of Self and Clinical Breast Exams**

Jessica L Kato, Paul I Tartter

St. Luke’s Roosevelt Hospital Center, New York, NY

**Objective:** Patients treated with breast-conserving surgery remain at risk of developing metachronous breast cancer in the ipsilateral or contralateral breast. Mammography and clinical exam remain critical in detecting local of 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 usually with pathology inconsistent with a local recurrence. The presentation of the primary cancer was compared to the presentation of the metachronous 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 were identified on 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 metachronous 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>Presentation</th>
<th>Primary Cancer (%)</th>
<th>Metachronous Cancer (%)</th>
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<tr>
<td></td>
<td>(n = 136)</td>
<td>(n = 136)</td>
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<tr>
<td>Mammography density</td>
<td>50.7% (68)</td>
<td>47.1% (64)</td>
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<tr>
<td>Patient self-exam</td>
<td>37.5% (52)</td>
<td>34.5% (48)</td>
</tr>
<tr>
<td>Other</td>
<td>12% (16)</td>
<td>18% (24)</td>
</tr>
<tr>
<td>Mammographically occult</td>
<td>13% (18)</td>
<td>24% (33)</td>
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**Table 2 - Presentation of metachronous cancer**

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Ipsilateral Metachronous</th>
<th>Contralateral Metachronous</th>
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<tr>
<td></td>
<td>(n = 45)</td>
<td>(n = 95)</td>
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<tr>
<td>Mammography density</td>
<td>29% (13)</td>
<td>23% (22)</td>
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<tr>
<td>Patient self-exam</td>
<td>41% (22)</td>
<td>61% (62)</td>
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<tr>
<td>Other</td>
<td>12% (16)</td>
<td>11% (10)</td>
</tr>
<tr>
<td>Mammographically occult</td>
<td>31% (14)</td>
<td>21% (19)</td>
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1637
Immediate Breast Reconstruction of Segmentectomy Defects Using 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 Node Using Touch Imprint Cytology and Rapid Immunohistochemistry
A Khan, M Haanee, N Uddin, N Sacks
Shaukat 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 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 showed 27 cases with axillary metastasis (90.6%). 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.

Conclusions: This study shows that frozen section H&E remains superior to TIC and ultrarapid IHC in detecting axillary sentinel node metastasis. TIC missed five of six (83.3%) micrometastasis and should not be considered a sole diagnostic tool for intraoperative diagnosis. Ultrarapid IHC is best at detecting micrometastasis, however, the procedure requires technical expertise.

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<td>Touch Imprint</td>
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<td>Sensitivity</td>
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1752
Idiopathic Lobular Granulomatous Mastitis: An Institutional Experience
Hadi M Khan1, Corinne Stobaugh-Stevenson2, Nancy Joste2, Therese Bocklage2, John C Russell2

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 patients (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.

1758
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 Khanna, Steven Eric Olyejar, Mark Ono, Aaron Ambrad, 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.

Conclusions: In patients treated at our institution, infection rates appear similar in patients whose brachytherapy catheter was inserted with or without the CED.
1684 A Comparison of Prognostic Factors in Locally Advanced and Inflammatory Breast Cancer
Rebecca Klion1, Erica Salinas1, Lauren Grasso-Leibaudi1, Ana Maria Lopez1, Victor Gonzalez1, John Lad2
1UT Southwestern Medical Center, Dallas, TX, 2University of Arizona Cancer Center, Tucson, AZ

Objective: Inflammatory breast cancer (IBC) comprises approximately 5% of all invasive breast cancers. Despite advances in the treatment of breast cancer, IBC patients continue to have poor overall survival (OS). Locally advanced breast cancer (LABC) can present with similar clinicopathologic characteristics. We hypothesized that IBC patients were more likely to have estrogen receptor (ER), progesterone receptor (PR), and HER2 negative cancers compared to LABC. Methods: We performed a retrospective review of female patients with nonmetastatic LABC or IBC treated at our institution from 1999 to 2009. LABC was defined as stage IIIB or stage III; IBC was defined with the ABCSG criteria. The child of Herceptin Staging Model (CMS) and expression of axillary lymph nodes were performed on all patients. Diffuse axillary lymphadenopathy (DIAL) was defined as erythema involving at least one third of the breast with less than 6 months duration of symptoms prior to diagnosis, documented by a surgical or medical oncologist. Primary endpoints included OS, locoregional recurrence-free survival (LFRS), and metastasis-free survival (MFS). Statistical analysis was performed with the Kaplan-Meier method for univariate analysis (UA) and the Cox proportional hazard model for multivariable analysis (MA) controlling for patient characteristics, prognostic factors, and treatment modalities. Results: A total of 191 patients were included. Mean follow-up was 4.8 years. Larger tumor size, presence of lymphovascular or dermal lymphatic invasion, lack of ER/PR expression, HER2 amplification, and elevated Ki67 were all significantly associated with decreased OS on univariate analysis (p < 0.05). Treatment factors associated with improved OS on univariate analysis included receipt of adjuvant chemotherapy (p = 0.009) and hormonal therapy (p < 0.0001), while neoadjuvant chemotherapy was associated with decreased OS (p = 0.006). Patients who suffered a locoregional recurrence were significantly more likely to suffer a metastatic recurrence (p < 0.0001). On MA, only absence of LVI (p = 0.05, HR 3.3) and receipt of adjuvant chemotherapy (p = 0.009, HR 0.2) remained significant for LABC patients. None of the prognostic or treatment variables were significant for MA for IBC patients. Twenty (10.74%) patients had IBC. The majority of IBC patients were Caucasian (65%) with a similar mean age. IBC patients were significantly more likely than LABC patients to receive neoadjuvant therapy (90% vs 14%, p < 0.0001) as well as tri-modality treatment, including chemotherapy, radiation, and surgery (89.5% vs 55.4%, p = 0.003). Disease free survival (DFS) (p = 0.008) and MFS (p < 0.0001) for IBC patients were significantly worse. TN patients had worse OS compared to non-TN patients for the overall dataset (p < 0.0001). There was a statistically significant higher prevalence of IBC tumors in the TN subgroup. However, while there was no significant difference in OS between IBC TN patients (n = 7) compared to LABC TN patients (n = 27) (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.
1715
Socioeconomic and Racial Differences in Hospital Utilization in Breast Cancer Patients
Amanda L Kong, Tina WF Yen, Liliana E Pezzin, Haiyan Miao, Rodney A Sprarapani, 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 indicated 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 < 0.0001), less likely to have completed more than a high school education (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 being treated at a low-volume hospital were 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.

1716
Variations in Postmastectomy Reconstruction Rates: Invasive and In Situ Carcinoma
Laura Krupper, 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) (233.5) or invasive breast cancer (174.0-174.9) 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 (CCC), 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 were 34% 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 nonteaching hospitals, for either diagnosis (ORDCIS, 2.09; 95% CI, 1.66-2.64; ORinv, 2.69; 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 variations in reconstruction rates which vary according to diagnostic: DCIS versus invasive carcinoma. The proportion of patients undergoing immediate reconstruction after mastectomy for DCIS is 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.

1717
Does Duration to Ipsilateral Breast Tumor Recurrence (IBTR) Affect the Success or Failure of Reoperative Sentinel Lymph Node Biopsy? (SLNB)?
Nafisa Kuwajerwala, Christine Widders, Lucia Victoria, Judy Boura, 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 and IBTR has not 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), Prior SLNB (<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 reoperative 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 reoperative SLNB, 10 of the 28 patients (35.7%) had IBTR >10 yrs. 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.

1718
Sentinel Lymph Node Biopsy in Prophylactic Mastectomy—Are We Overtreating? Experience at a Community Hospital
Nafisa Kuwajerwala, NAYANA DEKHNE, DENNETTE FEND, PATRICIA PENTIAK, MITUAL AMIN, VITORIA LUCIA
William Beaumont Hospital, MI

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 index surgery. Variations in the specimens underwent standard pathologic evaluation. The SLNB 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 nodules or intramammary nodes (non-SLNB). 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 TiA and grade I 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.
Breast cancer is the most common cancer in women in Hong Kong. The incidence is 1 in 20 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 until 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 analysis, such as +/- tests, chi-square analysis, and Fisher’s exact tests will be used to compare variables that have association or difference among variables. Survival probabilities, such as overall survival, diseasefree 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 during this period. Sixteen percent of our cohort had triple-negative cancers; 55.8% had HER2 positive cancers; 13.3% of our cohort had HER2 positive cancers; 13.3% of our cohort had ER negative cancers. Of those known, 39.2%, 45.3%, and 15.6% had grade I, II, III cancer, respectively; 83%, 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.
1692 Yield of Selective MRI in Preoperative Assessment of Newly Diagnosed Breast Cancer Patients Planned for Breast-Saving Surgery

Tehilah Menes, Steven Zisman, Shlomo Shneebaum, Oriet Golani, F. Sperber, Y. Klausner
Tel Aviv Sourasky Medical Center, Tel Aviv, Israel

Objective: To determine the utility of MRI in candidates for breast-conserving surgery is currently being debated. When MRI is routinely used, other forms of cancer are found in 16% of patients, with 1% of patients undergoing more extensive surgery. In our center, preoperative MRI is selectively used in candidates for breast-conserving surgery. We examined the findings on MRI in this selective patient population and their impact on the surgical plan.

Methods: We retrospectively reviewed the records of newly diagnosed breast cancer patients (January 2007 - June 2010). All patients were candidates for breast-conserving surgery and underwent MRI prior to surgery. The patients were divided into two groups: patients who underwent core biopsy of the primary tumor or who underwent additional treatment were excluded. Data collected included age, family history, delay between presentation and surgery, and indications for MRI. Findings were noted as to MRI findings, pathology, and actual surgery. Pathology results were reviewed as well. Patients were divided according to indication for MRI: young age (<40), dense mammograms, extensive calcifications, lobular cancer, multifocal disease (diagnosed prior to MRI), and discordance between physical exam, mammography, and sonography. Rates of additional suspicious findings, additional positive and negative biopsies, and change in management were calculated per each indication. Change in management was defined as any change in the surgical plan, including a larger lpectomy than originally planned. Institutional Review Board approval was received prior to commencement of the study.

Results: The study group included 106 women. Median age of the patients was 58 (range, 31-81). Mean delay between first presentation to the medical center and surgery in these patients was 50 days (range, 9-241). The most common findings on MRI included additional suspicious findings (43%), additional positive biopsies (27%), and discordance (25%). There was good concordance of ER, PR, HER2, and Ki67 expression (75%). Additional suspicious findings were seen on MRI in 48 (45%) of the patients and did not change significantly with the indication for MRI. Additional work-up, which included a negative biopsy, was done in 8 (7%) patients. Additional biopsy-proven malignancy was found in 18 (17%) of the patients. The highest rate of additional positive biopsies was found in patients with dense breasts (n = 14, 27%) and in young patients (n = 4, 27%). The additional suspicious findings on MRI prompted a change in the surgical plan in a third of the patients. 14 had a larger breast-conserving surgery, 14 had a mastectomy, and 6 had additional surgery on the contralateral breast. In 52% of patients, the tumors were multifocal.

Conclusions: In young patients, patients with dense mammograms, with lobular cancer, and imaging discordance both on MRI and mammography, use of preoperative MRI is associated with a high rate of additional suspicious findings and a high rate of positive biopsies. Due to the small numbers in each subgroup and the overlap between the different groups, it is hard to make any meaningful comparisons. In this selected group of patients, the suspicious findings on MRI prompted a change in the surgical plan in a third of the patients.

Table 1: Findings on MRI according to indication for MRI

<table>
<thead>
<tr>
<th>Number</th>
<th>Additional Suspicious Findings</th>
<th>Additional Positive Biopsies</th>
<th>Additional Negative Biopsies</th>
<th>Change in Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>106</td>
<td>48</td>
<td>27</td>
<td>32 (32%)</td>
</tr>
<tr>
<td>Age &lt;40 (total N=78) Yes</td>
<td>27 (23%)</td>
<td>12</td>
<td>6</td>
<td>7 (9%)</td>
</tr>
<tr>
<td>No</td>
<td>16 (21%)</td>
<td>36 (47)</td>
<td>21</td>
<td>5 (6%)</td>
</tr>
<tr>
<td>Family History (total N=99) Yes</td>
<td>36 (47)</td>
<td>18 (25)</td>
<td>6</td>
<td>7 (10%)</td>
</tr>
<tr>
<td>No</td>
<td>60 (65)</td>
<td>30 (50)</td>
<td>25</td>
<td>5 (8%)</td>
</tr>
<tr>
<td>Dense mammogram (total N=75) Yes</td>
<td>51 (68)</td>
<td>26 (51)</td>
<td>5</td>
<td>14 (27%)</td>
</tr>
<tr>
<td>No</td>
<td>24 (32)</td>
<td>44 (61)</td>
<td>10</td>
<td>2 (5%)</td>
</tr>
<tr>
<td>Lobular cancer (total N=104) Yes</td>
<td>23 (22)</td>
<td>9 (6)</td>
<td>0</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>No</td>
<td>81 (78)</td>
<td>46 (45)</td>
<td>5</td>
<td>12 (10%)</td>
</tr>
<tr>
<td>DCIS (total N=99) No</td>
<td>57 (59)</td>
<td>24 (41)</td>
<td>5</td>
<td>13 (23%)</td>
</tr>
<tr>
<td>Yes</td>
<td>22 (22)</td>
<td>25 (51)</td>
<td>5</td>
<td>2 (4%)</td>
</tr>
<tr>
<td>Estrogen calculated (total N=78) Yes</td>
<td>25 (24)</td>
<td>12 (48)</td>
<td>4</td>
<td>2 (8%)</td>
</tr>
<tr>
<td>No</td>
<td>53 (66)</td>
<td>34 (47)</td>
<td>17</td>
<td>9 (12%)</td>
</tr>
</tbody>
</table>

Multifocal disease (%): 51 (68) vs 24 (22) = 20 (25%).

Mismatch included all cases where physical findings and imaging findings (before MRI) were not concordant.

**Multifocal disease included all cases with multifocal disease diagnosed prior to MRI study.**

1706 Does Tumor Immunohistochemistry Discordance Between Core Needle Biopsy and Mastectomy Tissue Affect Clinical Outcomes? (Treatment Recommendations)

Mehghan Millburn1, Martin Rosman1, W Charles Mylander1, Wen Liang1, Jeffrey Hooke2, Al Kovatich2
1. Arizona Oncology, 2. University of Texas, Southwestern, Dallas, TX

Study Aim: This study analyzed prospectively archived tissue specimens that presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Patients who presented with a diagnosis of invasive breast carcinoma from 06/23/2010 to 10/1/2010 were chosen from a multicenter, IRB-approved study. Parameters included, tumor grade, hormone receptors and findings of ductal enhancement on breast MRI.

Methods: We performed a retrospective chart review of women seen for breast/ovarian cancer genetic counseling in 2008 and 2009 at Parkland Hospital, the Dallas County health system for uninsured or underinsured patients. 1635 BRCA Gene Mutation Testing and Uptake of Risk Management Recommendations in a Minority Underinsured Population

Jodie Mook, Heidi A. Hamrams, Linda Robinson, Elizabeth Morrow, Jay Morrow, David Ehus
University of Texas, Southwestern, Dallas, TX

Objective: Despite the importance of prevention and detection for women at increased risk for breast and ovarian cancer, little empirical research is focused on cancer risk management among medically underserved populations. Our objective was to document rates of prophylactic breast surgery and surveillance practices among a sample of ethnically and socioeconomically diverse women seen for cancer genetic counseling.

Methods: We performed a retrospective chart review of women seen for breast/cervical ovarian cancer genetic counseling in 2008 and 2009 at Parkland Hospital, the Dallas County health system for uninsured or underinsured patients.

Results: Medical records were reviewed for 195 female patients seen for breast/cervical ovarian cancer genetic counseling (mean age = 43.3 years). Median follow-up-time from genetic counseling to data abstraction was 16 months with a range of 6 to 29 months. The majority of patients were either Hispanic (43.5%) or African American (37.4%). Less than 30% had private insurance. Of the women in the sample, 72.3% had a previous diagnosis of breast cancer, 72.2% had been diagnosed with another form of cancer, and 20.5% had no prior cancer diagnosis. Of the 195 eligible women, 126 (64.6%) were tested for BRCA1/2 mutations, of those who were tested, 25 (19.9%) were found to be mutation carriers. Fourteen (7.2%) women had prophylactic mastectomies after positive testing. This included 6 (26.1%) BRCA gene mutation carriers, 4 (42.9%) noncarriers, and 3 (43.3%) individuals not tested. One woman with a “variant of uncertain clinical significance” result also underwent prophylactic mastectomy. Of the 183 women who did not undergo prophylactic mastectomy, 114 (62%) had at least one mammogram or MRI for screening purposes during the median follow-up of 16 months. Those who had at least one screening mammogram or MRI included 68.4% of BRCA carriers, compared to 63.7% of noncarriers and 59.4% of women who were not tested.

Conclusions: In this ethnically diverse underserved population, genetic counseling was most frequently performed in women with a previous cancer had already included in our analysis as they had the potential impacts of risk-reducing strategies. The uptake for breast cancer surveillance was disappointingly low, even among BRCA gene mutation carriers. Future efforts should focus on proactively identifying the women with high-risk family histories before a cancer diagnosis and on identifying barriers to breast cancer surveillance.
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 proceeding/so bre 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 positive margins (12%), and wound complication related to patient preference (42%), extent of disease based on clinical and surgical assessment (25%), BRCA positivity (19%), persistent positive margins (12%), and wound complication related to persistent sinus tract (2%).

Conclusions: Persistent sinus tract, the major reason 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

| MRI | T category | Pathological Cancer Size (cm) | ER | Grade | LN | ER+ | ER- | ILC | DCIS
|-----|------------|-------------------------------|----|-------|----|-----|-----|-----|-----
| Non-MRI | 25% | 0.31 | 0.08 | 0.67 | Non-MRI
| MRI | 25% | 0.31 | 0.08 | 0.67 | MRI

Poster Presentations

Cost-Effectiveness Analysis of Routine Frozen-Section Analysis of Breast Margins Compared With Reoperation for Positive Margins

John B Dobson, Gary L Keeney, James W Jakub, Amy C Degirmen, Judy C Boughery

Mayo Clinic, Rochester, MN

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-excision 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 payer). For strategy A, we used an operating room time of 90 minutes for lumpectomy. The rate of positive margins and reoperation was varied 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 our 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 $4,385 (15% reoperation rate) to $6,306 (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 payer for strategy B ranged from $3,284 to $5,665 (50% reoperation rate). For strategy B, the cost for cases with initial negative margins was $3,550 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-resection rate was greater than 25%.

Conclusions: Routine use of frozen-section analysis of lumpectomy margins decreases evaluation rates for margin control. Looking at cost to provider, frozen section is cost-effective when the margin re-excision rate is greater than 30% and for Medicare reimbursement, frozen section is cost-effective when margin re-excision rate is greater than 25%.

Factors Associated With Malignancy on Ultrasound-Guided Axillary Core Needle Biopsy

Bharat Pandey1, Karin Karajanjan2, Won Bae1, Sharon Lum1

1Department of Surgery, Loma Linda University School of Medicine, Loma Linda, CA, 2Department of Radiology, Loma Linda University School of Medicine, Loma Linda, CA

Objective: Axillary lymph node status 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-directed 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 factors including patient age, lymph node size, BI-RADS score, breast pathology, site of biopsy (axillary tail vs axilla), clinically suspicious lymphadenopathy, focal cortical thickening, irregular borders, solid mass lesion, vascularity, absence of a fatty hilum, and echogenicity.

Results: During the study period, of 95 axillary ultrasound-guided core needle biopsies performed, 52 (56.2%) were malignant and 43 (47.4%) were benign. The average patient age was 54.4 (range, 23-89). One third (33.3%) 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). Malignant pathology on axillary ultrasound-guided core needle biopsy was significantly associated with clinical suspicion (p < 0.01), axillary lymph node size (p < 0.002), focal cortical thickening, absence of a fatty hilum, and echogenicity.

Conclusions: Malignant findings on axillary ultrasound-guided core needle biopsy are associated with the readily available clinical characteristics of suspicious adenopathy, patient age, 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-procedural patient counseling.
1676 Timing of Bilateral Metachronous Breast Cancer
Chanta R Reyna, Benjamin J Cousins III, Jennifer L Baynosa, Daniel M Kirgan
University of Nevada School of Medicine, Las Vegas, NV

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 diagnosis, and 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 cancers and were excluded from the study. Thirty-nine cases were identified to be bilateral metachronous breast cancer presenters (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.

1654 Outcome in Augmented Patients Who Subsequently Develop Breast Cancer
Jessica Rayhanabad1, Dennis Holmes1, Stephanie Valente1, Janie Weng Grumley1, Nirav Savalia1, Melvin J Silverstein2
1Keck School of Medicine, University of Southern California, Los Angeles, CA, 2Hoag Memorial Hospital Presbyterian, Newport Beach, CA

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. In failed 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
Jessica Rayhanabad1, Stephen F Sener1, Stephanie Valente1, Janie Weng Grumley1, Melvin J Silverstein1
1Division of Surgical Oncology, Keck 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. 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 resection were reviewed. These patients had palpable tumors and underwent axillary resection. Breast cancer-specific survival rates were calculated using the Kaplan-Meier Method.

Results: Three thousand seven hundred thirteen axillary node or sentinel node dissections were performed. Nodal positivity was analyzed by tumor category and whether the abnormality was clinically palpable. Nodes positive by immunohistochemistry only with foci of cancer cells equal or less than 0.2 mm or <200 cells (ITCs) were not counted as positive [N0(i+)]. Prebiopsy mammography was performed in 121 of 132 augmented patients with palpable lesions. In failed 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: Palpability was a poor prognostic sign for all T categories other than Tis. There 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.
The Goldilocks Mastectomy: Our Experience in Utilization of Redundant Mastectomy

Flap Tissue Only for Reconstruction in Women With Macromastia

Yara V Robertson, V Suzanne Klimberg
University of Arkansas for Medical Sciences, Little Rock, AR

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. Given the known differences in the distribution of blood types by race, we hypothesized that human ABO blood type plays a role in the decreased survival seen in AA breast cancer. Given the known differences in the distribution of blood types by race, we hypothesized that human ABO blood type plays a role in the decreased survival seen in AA 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 blood type were evaluated using Kaplan-Meier survival curves.

Results: Results of forty-five patients were evaluated. Average age was 54±7 years old. The mean proportion was seen in patients with type AB (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 breast cancer. For stage II, the risk was increased to 1.7 times (see Figure). This difference in breast cancer patients than AA. For stage I, blood type A, AA were at 2.6 times increased risk of breast cancer. For stage II, the risk was increased to 1.7 times. Even when poverty, access to healthcare, educational disparity, and socio-economic status are accounted for, AA women in general have poorer outcomes from breast cancer.

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. Elucidation of the causal relationship between poorer breast cancer outcomes and blood type may lead to strategies for possible prevention and/or treatment.

Rise in Concurrent Uterine and Breast Cancer and Economic Disparity: National Trends

Jessica Ryan, Justin Lee
St. Elizabeth’s Medical Center, Boston, MA

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.

Comparison of Axillary Lymph Node Response After Neoadjuvant Chemotherapy Between Patients With Triple-Negative Breast Cancer and Receptor-Positive Disease

Laila Samiljan, Irfan Qureshi, Brian Celso
University of Florida College of Medicine, Jacksonville, FL

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 highly chemosensitive and have higher pathologic complete response rates. 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 receptor positive disease (NTNBC).

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 poschemeotherapy 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 when NAC included 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 (100% 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 vs axillary node dissection 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 = 0.02). There was no survival difference in patients who converted to node-negative status. Overall, TNBC patients had shorter survival time (X2 = 5.11, 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.

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Integrating of the IBTR Prediction Tool Into Surgical Decision-Making
Freya Schrabel, Jennifer Chun, Deborah Ashford, Artelle Cimino, Jessica Billig, Cristina Checka, Amber Guth
NYU Langone Medical Center, New York, NY
Objective: IBTR was developed as a tool to predict the risk of ipsilateral breast tumor recurrence (IBTR) following breast conserving surgery. This nomogram incorporates information about 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 women treated at the British Columbia Cancer Agency. While this tool was developed in order to better quantify the benefit of postsurgical radiation therapy, we sought to explore the potential use of this tool in preoperative surgical decision-making.

Methods: Our study included women 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 5% by the model. This is the same risk as obtained from the British Columbia Cancer Agency data.

Results: Of the 208 samples examined, 104 were benign and 104 were malignant. Within the malignant specimens, 55 showed ALDH1 expression (53%) and 49 (47%) did not. Among the malignant specimens, 79 (76%) showed ALDH1 expression and 29 did not (28%) (p = 0.006). When comparing the specimens that either showed no staining or weak staining to those that had moderate or strong staining, 79 (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 50 (48%) showed moderate or strong expression (p = 0.000).

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 the 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 fully understand the clinical significance regarding the biology of breast cancer in international populations.

Integration of the MSKCC Nomogram to Predict SLN Metastasis in Men with Breast Cancer
Jeffrey S Scow, TS Hinok, JS Boughey, JW Jakub, MI Miller, MP Minnig, RP Patel, LM Daddour, AC Dagnim
Mayo Clinic, Rochester, MN
Objective: The MSKCC nomogram to predict sentinel lymph node (SLN) metastasis was developed and validated predominantly in women; men comprised <1% of the study population. This nomogram is available to the public general as an online calculator and requires the user to have knowledge of nine clinicopathologic variables. The aim of this study was to assess the performance of the MSKCC nomogram to predict SLN metastasis in men with breast cancer.

Results: During the study period, 35 men were treated for breast cancer. Median age was 67 years (range, 44-85 years). All patients underwent mastectomy with SLN surgery. Axillary lymph node dissection was performed in all cases where the SLN was positive. All patients were diagnosed with invasive ductal carcinoma which was located in the subareolar/central region of the breast. Median tumor size was 2.1 cm (range, 0.7-8.0 cm). Nuclear grade 2 of 3 was most common (69%). LVI and multifocality were present in 17% and 0% of patients, respectively. ER and PR were positive in 100% and 91% of patients, respectively. SLN metatstasis were present in 57% (20/35) of patients. Median predicted probability of SLN metastasis was 37% (range, 18-90%). Median predicted probability was 35% (range, 18-90%) for node-negative cases and 37% (range, 21-80%) for node-positive cases (p = 0.4). The area under the ROC curve was 0.595 (95% CI, 0.416-0.757). There was no distinct predicted probability above which all patients were found to have SLN metastasis. Conversely, there was no distinct predicted probability below which all patients had not SLN metastasis.

Conclusions: Despite including men with breast cancer in the development and validation of the MSKCC nomogram to predict SLN metastasis, the nomogram was not able to discriminate which male patients had a high probability of having SLN metastasis. This nomogram should be used with caution when counseling men with breast cancer about their risk of SLN metastasis.

Expression of ALDH1 as a Marker of Mammary Stem Cells in Benign and Malignant Breast Tissues
Theresa Schwartz, Stephanie Kingman, Iman Martin, Celina Klee, Lizh Wuich, Lisa Newman
1University of Michigan, Ann Arbor, M, 2University of Illinois, Chicago, IL
Objective: Premenopausal breast cancer and tumors that are negative for the estrogen receptor, the progesterone receptor (PR), ER (p < 0.05) and (2) are substantially more common among 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 disease. The mammary stem cells, as identified by cells expressing the marker aldehyde dehydrogenase (ALDH1), appear to be correlated with malignat transformation of breast tissue and progression into the virulent "triple negative" phenotype. ALDH1-expression is found in a minority of breast specimens of white American and European-American women (<30%), but very little is known about the frequency of this marker in women of African descent, who are known to have an increased risk for triple-negative breast cancer. The aim of our study was to investigate the rate of expression of ALDH1 in both benign and malignant breast tissue among patients in the African population.

Methods: We analyzed benign and malignant breast specimens from Ghanaian women through international breast cancer research partnership established by the surgical breast oncology section of the University of Michigan and the Komfo Anokye Teaching Hospital in Kumasi, Ghana. We screened 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, 79 (76%) showed ALDH1 expression and 29 did not (28%) (p = 0.006). When comparing the specimens that either showed no staining or weak staining to those that had moderate or strong staining, 79 (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 50 (48%) showed moderate or strong expression (p = 0.000).

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 the 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 fully understand the clinical significance regarding the biology of breast cancer in international populations. This work also demonstrates the value of international breast oncology collaborative efforts.

Assessment of the Memorial Sloan-Kettering Cancer Center Nomogram for the Prediction of Positive Nodes in Sentinel Node Cancer
Jeffrey S Scow, Sejal S. Shah, Carol Reynolds, Amy C Degnim, James W Jakub, Judy C Boughey
Mayo Clinic, Rochester, MN
Objective: Membrane Sloan-Kettering Cancer Center (MSKCC) nomogram to predict sentinel lymph node (SLN) metastasis was developed and validated predominantly in women; men comprised <1% of the study population. This nomogram is available to the public general as an online calculator and requires the user to have knowledge of nine clinicopathologic variables. The aim of this study was to assess the performance of the MSKCC nomogram to predict SLN metastasis in men with breast cancer.

Results: Of the 87 patients who were enrolled and 76 patients with 96 drains completed the study, 40 patients (52%) were randomized to drain antisepsis and 36 patients (44%) to controls (drains). Antibiotics were administered to all patients prior to incision and discontinued within 24 hours. TM, 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 was 7 days (range, 5-23 days), with a median output of 25 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 in 64% of control and 23% of treated cases (23/35, p < 0.0001). Drain tubing was cultured at time of drain removal from 52 patients (67 drains - 29 control and 33 antisepsis) and was positive in 21% (6/29) of control drains and 0% (0/38) of treated drains (p = 0.005). Among patients with positive bulb fluid cultures at the time of drain removal, the drain tubing also cultured positive in 32% (6/19) of controls and 0% (0/7) in antisepsis. Complete nodal clearance was achieved in 5 patients (5%) 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. Based on these data, further study of drain antisepsis and its impact on ISSI rate is warranted.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Control</th>
<th>Drain Antisepsis</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients</td>
<td>43% (36)</td>
<td>53% (40)</td>
<td></td>
</tr>
<tr>
<td>Drains</td>
<td>46% (44)</td>
<td>54% (52)</td>
<td></td>
</tr>
<tr>
<td>Drain bulbs with positive fluid cultures at POD 6-8</td>
<td>64% (28)</td>
<td>23% (12)</td>
<td>0.0004</td>
</tr>
<tr>
<td>Drain bulbs with positive bulb cultures at time of drain removal</td>
<td>21% (6/29)</td>
<td>0% (0/38)</td>
<td></td>
</tr>
<tr>
<td>Surgical site infections</td>
<td>8% (3)</td>
<td>3% (1)</td>
<td>0.34</td>
</tr>
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</table>

Table: Culture results for patients randomized to standard (control) vs antiseptic drain care

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Validity of "Additional Nodal Metastasis" Breast Cancer Nomogram of Memorial Sloan-Kettering Cancer Center in African American Women
Elizabeth Shaughnessy1, Mardiajah Hamidzic1, Alan Duska2, Kelly McKeel1
1University of Cincinnati, Department of Surgery, Cincinnati, OH, 2University of Cincinnati, Department of Environmental Health, Cincinnati, OH
Objective: Memorial Sloan-Kettering Cancer Center (MSKCC) evolved the Additional Nodal Metastasis Nomogram 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 that of European white women, 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 patient population.
Methods: In the retrospective review of medical charts, we identified 52 AAW who meet nomogram’s criteria and underwent both 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. Given 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 55 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, 71.7% of these tumors expressed estrogen receptor. 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 73.1% 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 three risk classes—low risk <10%, intermediate 10-20%, and high risk >20%—our data indicates an incidence of 22.2% observed positive nonsentinel nodes in our low-risk group.
Conclusions: 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 younger than 35, this nomogram may not be as reliable a predictor for low risk in AAW as it is for 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.

1718
Elderly Breast Cancer Patients Survival: The Impact of Co-Morbidities
Farha Sheikha, Barbara Packja, Richard Gray, Nabil Wasif, Amylou Duecka
Mayo Clinic Arizona, Scottsdale, AZ
Objective: Prior studies have identified invasive estrogen receptor positive (ER+)-breast cancer in the elderly to have a good prognosis. High number of co-morbidities in this group may confound breast cancer prognosis. We sought to examine the overall prognosis in women above the age of 70 with newly diagnosed T1 ER+ breast cancer taking into consideration our co-morbidities.
Methods: IRB approval was obtained for this study. Data was generated from a prospective database of all women over 70 years old, ER+, HER2 negative, with tumors less than 2 cm who were surgically treated for breast cancer between 2005 and 2010. Kaplan Meier method was used to assess survival.
Results: Two hundred thirty seven women aged 70 and above who were ER+ and HER2 negative underwent surgical treatment. Most women presented with image-detected cancers (67%) and invasive ductal carcinoma (70%) compared to invasive lobular carcinoma (8%) and other ductal subtypes (22%). Mean tumor size was 1.1 cm. Angiolymphatic invasion was present in 6% (15 patients) and 13% (30) multiple ipsilateral tumors. Positive lymph node involvement was found in 31 (14%) women. One hundred eighty-nine (84%) women underwent breast-conserving therapy, 33 (15%) mastectomy with reconstruction. A total of 64% underwent radiation therapy after BCT. Adjuvant endocrine therapy was given to the majority of women (70%), whereas only 3% received chemotherapy. Co-morbidities included hypertension, 56%; coronary artery disease, 14%; hyperlipidemia, 37%; COPD, 3%; renal insufficiency, 5%; and diabetes, 10%. Average BMI among patients was 29, with 63% having a BMI greater than 25. Average follow-up time was 25 months. The rate of local recurrence was 1% (3 women) and the rate of systemic recurrence was 1% (3), while overall survival was 89%. The rate of recurrence-free survival was 88%. When analyzing cause of death, 36% (6 patients) had breast cancer-related death vs 70% (22) who died from other causes, including 10 who died of other cancers.
Conclusions: In our medically compliant elderly population, we confirm that women who are diagnosed with T1 ER+ breast cancer have a good prognosis and that co-morbidities have a huge impact on overall survival. Even with a short follow-up, there were a significant number of deaths from other causes. This should be taken into consideration by physicians and patients alike when they are making their treatment choices.

1625
Treatment of Ductal Carcinoma In Situ (DCIS) of the Breast Based Upon Individual University of Southern California/Van Nuys Prognostic Index (USC/VNP) Scores: 1529 Patients With an Average Follow-Up of 84 Months
Melvin J Silverstein1, Michael D Lagios2, James R Waisman3, Lisa Guerra4
1University of Southern California, Los Angeles, CA, 2BreastLink Medical Group, Long Beach, CA, 3Hoag Memorial Hospital, Newport Beach, CA
Objective: The USC/VNP is an algorithm, based on a rigid pathology protocol, which permits results of many objective and measurable prognostic variables to be used in predicting local recurrence in patients with DCIS. These include tumor size, margin width, nuclear grade, age, and comedonecrosis. When originally published (Cancer 1996;77:267-74), the index was based on 1511 patients and treatment recommendations were made based on the predicted risk of excision alone for those who scored 4-6; excision plus radiation therapy for those who scored 7-9; mastectomy for those who scored 10-12. With four and a half times as many patients and nearly twice the number of randomly developed treatment recommendations our updated index score is 41 (23-62), stratified by margin width, rather than by groups of scores. Since current NCCN Treatment Guidelines for DCIS have been amended to include excision alone as an acceptable alternative but without listing any selection criteria, analysis by USC/VNP score has become increasingly valuable.
Methods: One thousand five hundred ten patients with pure DCIS, with 84 months of follow-up were analyzed by: (1) individual USC/VNP scores (4 through 12), (2) multiple margin widths (1, 3, 5, and 10 mm), (3) treatment (excision plus radiation therapy versus excision alone), and (4) treatment needed to achieve a local recurrence probability of less than 10%, 15%, 20%, or 25% or 12 years.
Results: The table illustrates the treatment and margin width necessary to achieve a probability of local recurrence of less than 20% at 12 years and was derived using the Kaplan-Meier method. As the acceptable local recurrence probability is adjusted up or down, the treatment recommendations change.
Conclusions: With more than four and a half times as many patients as originally published, the USC/VNP can be more finely tuned to aid in the treatment decision-making process. To achieve a local recurrence probability of less than 20% at 12 years, these data support excision alone for all low-risk patients, and ALND 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 of predicted positive with nomogram

<table>
<thead>
<tr>
<th>Risk Class</th>
<th>No (%)</th>
<th>Positive Nonsentinel Nodes (%)</th>
</tr>
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<tbody>
<tr>
<td>&lt;10</td>
<td>91(17.30)</td>
<td>2 of 91(2.20)</td>
</tr>
<tr>
<td>10-20</td>
<td>12(23.08)</td>
<td>3 of 12(25.00)</td>
</tr>
<tr>
<td>&gt;=20</td>
<td>31(59.62)</td>
<td>17 of 31(54.80)</td>
</tr>
</tbody>
</table>

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 AMC Breast Center, Ann Arbor, MI
Objective: Positive margins following BCS are a significant problem, frequently leading to further surgery. The MarginProbe (Luma Vista Medical, Inc) which uses dielectric spectroscopy to capture the properties of the target tissue, compare them to predefined criteria, and classify them as normal or malignant. A prospective, randomized trial. Inclusion criteria included women with nonpalpable, histologically diagnosed carcinoma of the breast, requiring image-guided localization, undergoing lumpectomy, and completion of specimen orientation (either by automatic or manual method). A total of 362 patients were randomized to receive a margin probe (MarginProbe+®). The primary endpoint was complete surgical excision (CSE), the rate of patients with a histologically positive margin (≤ 1 mm) on specimen in whom all positive margins were reexcised (accounting for deep margins to fascia or anterior margins to skin for which no further surgery 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 were (1) incomplete removal of all main specimen positive margins, 20.8% (62/298) for device vs 58.3% (114/198) for control (P < 0.0001), or (2) positive margins from cavity re-excision. The positive margins were categorized as needed excision plus RT is appropriate for patients who score 7 and have margins <3 mm, 10% of our patient population.
Conclusions: This study, using a novel device to assess margins intraoperatively on lumpectomy specimen of patients undergoing BCS, successfully achieved a lower positive margin rate and reduced number of re-lumpectomies. In conclusion, use of the device led to minimal additional breast tissue removed.

USC/VNP Score No. (%) TREATMENT Needed 12-Year Recurrence
All 4 or 6 380 Excision alone ≤ 6%
7, Margins ≥ 3 mm 170 Excision alone 16%
7, Margins < 3 mm 115 Excision + radiation 14%
8, Margins ≥ 3 mm 111 Excision alone 15%
8, Margins < 3 mm 172 Mastectomy 0%
9, Margins ≥ 5 mm 36 Excision + radiation 19%
9, Margins < 5 mm 188 Mastectomy 0%
All 10 196 Mastectomy 7%
All 11 or 12 161 Mastectomy 10%
1680

Utility and Therapeutic Implications of Oncotype DX Analysis in Patients With Breast Cancer

Talar Tatarian1, Sameer Damle1, Anita P. McSwain1, Martin Ojong-Ntui2, Imad Tabbara3, Lesley Taylor1, Beth C Freedman2, Amanda J Rhee1, Julian Arce4, Rosanne Newell5

1Department of Surgery, Columbia University, New York, NY, 2Department of Surgery, St. Luke’s Roosevelt Hospital Center, New York, NY, 3Department of Breast Imaging, Mount Sinai Medical Center, New York, NY, 4Department of Pathology, Montefiore/Albert Einstein College of Medicine, Bronx, NY, 5Department of Surgery, Sound Shore Medical Center, New Rochelle, NY

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 patient’s breast cancer by analyzing 21 genes within a surgical specimen. This information is used to determine a “recurrence score” which estimates the tumor’s response to chemotherapy and the likelihood of recurrence at 10 years. This study was undertaken to see if an Oncotype DX result can help to determine the patient’s adjuvant treatment and to evaluate the long-term outcomes associated with Oncotype DX treatment

Methods: Clinic notes and pathology reports were gathered for 63 patients who had undergone Oncotype DX analysis between January 2004 and June 2009. The patients were presented to seven breast cancer specialists, including two surgical oncologists, three medical oncologists, and two radiation oncologists. Information provided included patient age, race, menopausal status, pertinent medical and family history, tumor size, nuclear grade, histopathology, estrogen, and progesterone receptor status, and presence and axillary micrometastases. For each case, panel members were asked to individually estimate the Oncotype DX recurrence score (low, low intermediate, high intermediate, high) based on the information provided. The group recommended appropriate adjuvant therapy both before and after the “recurrence score” was revealed. Changes in recommended therapy were then evaluated.

Results: 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 of 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 recommendation. Recurrence risk was estimated correctly in 44.4% of cases. The surgeons 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: The Oncotype DX testing changed management in a significant proportion of patient compared to traditional guidelines alone. Physicians, regardless of specialty, were able to estimate the recurrence score in less than half of the patients. Oncotype DX assay should be available in eligible patients to ensure that the appropriate adjuvant therapy is recommended.

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Breast Cancer in Ecuador: A Model to Expand Access in Underserved Areas

Lesley Taylor1, Beth C Freedman2, Amanda J Rhee1, Julian Arce4, Rosanne Newell5

1Department of Surgery, Columbia University, New York, NY, 2Department of Surgery, St. Luke’s Roosevelt Hospital Center, New York, NY, 3Department of Anesthesiology, Mount Sinai Medical Center, New York, NY, 4Department of Pathology, Montefiore/Albert Einstein College of Medicine, Bronx, NY, 5Department of Surgery, Sound Shore Medical Center, New Rochelle, NY

Objective: Breast cancer incidence is increasing worldwide. The WHO and international coalitions have designed resource-specific guidelines for early detection and treatment. Strategies to eliminate disparities must focus on providing patients in the field with referral mechanisms for patients from the remote village of Gualaceo, which would promote early detection and reduce mortality. This study evaluated breast cancer screening mammograms based on age. We evaluated 147 patients with palpable findings (17%) and 700 patients (83%) had normal breast exams. Of those, 368 patients (53%) were referred for mammography. Mammograms and pathology reviews were obtained on patients referred for surgery.

Results: In 7 days we examined approximately 30% of the population of women over the age of 40 in Gualaceo (843 of 2,454). Patient characteristics were as follows (median age): 46.2 years; age of first childbirth, 20.8; age of menarche, 13; monthly spending, $300. Their estimated literacy rate was 80%.

Conclusions: During our week of medical intervention, we bridged gaps in education and expanded access to breast care by over 30%. Furthermore, five 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 strategy in other settings.

1681

Malignant Phyllodes Tumors of the Breast and Impact of Race: 25-Year Experience in an Integrated Community Hospital System

July A Ty2; Wendy Ledesma3, Christopher V Nguyen4, Lisa Robinson2, James Marti5, Jeffrey Stepanoff1

1Aurora Health Care, Milwaukee, WI, 2University of Wisconsin, Madison, WI

Objective: Many have studied the impact of race on outcome of women diagnosed with epithelial breast tumors, with mixed results but overall consensus that black women have a worse outcome, either due to more aggressive tumor biology or lower socioeconomic status. We sought to determine whether race/ethnicity has a similar impact in black women diagnosed with mesenchymal breast tumors, ie, malignant phyllodes tumors (PTs).

Methods: Retrospective review of an integrated community hospital system’s breast cancer cases was performed, querying for malignant PTs of the breast. Histology was reviewed by a fellowship-trained breast pathologist. Statistical analyses were conducted to identify differences between black and non-black women with regard to patient, pathologic, and treatment characteristics and outcomes of recurrence or survival.

Results: Thirty-seven cases of borderline or malignant PTs were identified in the Cancer Registry database between 1985 and 2010. Two cases were excluded from analysis, as all slides were available for histologic review to distinguish between the diagnoses of malignant PT versus metastatic carcinoma. Of the 35 patients remaining for analyses, 20 tumors represented borderline PTs (ie, low-grade malignant PT) and 15 represented malignant PTs (ie, high-grade malignant PT), distributed equally amongst all races (p = 0.67). Both malignant PTs were diagnosed in 16 Caucasians, 3 Blacks, 1 Asian. Malignant PTs were diagnosed in 12 Caucasians, 3 Blacks. Median follow-up for all patients was 120 months (range, 1-295). Median age at diagnosis for all was 53 years (range, 21-85); for Blacks, 47.3 years (range, 22-70); and for non-Blacks, 54 years (range, 21-85) (p = 0.46). Median survival after diagnosis of the entire group was 60.5 months (range, 1-295 months); for Blacks, 131.5 months (range, 19-295); and for non-Blacks, 60.5 months (range, 1-287) (p = 0.01). Median tumor size for the entire group was 43 mm, for Blacks 41 mm (range, 20-188); and for non-Blacks, 43 mm (range, 8-215) (p = 0.78). All but one patient underwent surgical treatment (partial mastectomy, 18; total mastectomy, 16; no surgery as first course, 1) (p = 0.54). Four patients (1 Black, 3 non-Black) received radiation for documented reasons of involved mammography, large tumors, and positive close margins. Two patients (both non-Black) received first course chemotherapy. Recurrence developed in six patients (two locally, four distant), and was not influenced by race (p = 0.54). While disease-related survival was similar among women with recurrence defined as part of first-course treatment (p = 0.0001), it was not influenced by race (p = 0.43).

Conclusions: Race does not influence tumor size, surgery type, recurrence or overall survival after a diagnosis of either borderline or malignant PT.

7190

Predictors of Quality of Life 6 Months Into Treatment for Breast Cancer

Nguyen Tran, Nicole Albrecht, Janet Ousch, Laura Symonds, Bruno Giordani, Michael Bolvin

Michigan State University, Grand Rapids, MI

Objective: To investigate the predictive value of measures of psychological, emotional, and social QoL six months into treatment of breast cancer.

Methods: Participants were initially evaluated following a breast cancer diagnosis for emotional and spiritual well-being, quality of life, social support, sleep quality, and cognitive performance on computerized attention, memory, and learning tasks. Within 6 months of diagnosis, women were reevaluated. Breast cancer patients were matched to healthy controls based on age, race, education, income level, and menopausal status. Predictor variable measurements included the State-Trait Anxiety Inventory (STAI-short form), Patient Health Questionnaire (PHQ-9) for depression, National Comprehensive Cancer Network Distress Management Screening Measure (NCCN-DSMM), Bottomley Cancer Social Support Scale, Quality of Sleep scale, and the Cogstate computerized test battery for neuropsychological performance. The QoL outcome was measured using the HOPE Quality of Life Cancer Survivors Scale (QoLS) total score and subscale scores (physical QoL, psychological QoL, and spiritual QoL). Multiple regression analysis in SPSS version 18 was used to evaluate the relationship between the predictor assessments following diagnosis, and the QoL outcome measures within 6 months of diagnosis. Age, education, and income were entered as a priori variables.

Results: Eighty-four women newly diagnosed with breast cancer (mean age, 54.8 yrs, SD = 8.7) and 69 benign controls (mean age, 56.7; SD = 8.7) participated. Thirty-two of the 84 cancer patients underwent chemotherapy. Within 6 months following diagnosis, women who underwent chemotherapy had lower overall QoL than breast cancer patients not receiving chemotherapy (P < 0.001). Non-chemotherapy breast cancer patients also had lower overall QoL than benign controls, though not significant except for physical and social QoL. Overall QoL 6 months after diagnosis was significantly predicted by the following measures assessed at diagnosis: better social support (P < 0.001), less distress (P < 0.005), greater age (P < 0.014), and stronger self-reflecting on cognitive performance on a set of computerized memory and learning tasks (P = 0.056). The multiple regression model for these predictors accounted for 44% of the variance (R2 = 0.44) of the overall QoL outcome score (P < 0.001). In terms of specific QoL domains, chemotherapy was associated with poorer physical (P < 0.001) and social QoL (P < 0.001), while at the same time being significantly related to stronger spiritual QoL (P < 0.003).

Conclusions: Younger breast cancer patients and those with higher levels of distress following diagnosis have significantly poorer QoL within 6 months of diagnosis, especially those receiving chemotherapy. Social support and spiritual well-being may be important moderators of this relationship, and should be considered in guiding the interventions that can help sustain QoL throughout the treatment and recovery phases in women with breast cancer.
Complications of Immediate Breast Reconstruction Do Not Cause Treatment Delays
Tuan Tran1, Duncan Miles’, Tu Tran, Michael Hill, Sharon Lum2
1Loma Linda University School of Medicine, Loma Linda, CA, 2University of California, Berkeley, Berkeley, CA

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, 32-1029). 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 22.8%; stage III, in 20.7%; and stage IV, 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 not associated with adverse delays in time 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 (11-463), 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 initiation 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 time to 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.

Factors Predicting the Non-Sentinel Lymph Node Metastasis in Breast Cancer Patients With Sentinel Lymph Node Metastasis
Cihan Uras1, Deniz E Boler2, Umit Ince3, Neslihan Cabioglu4
1Acibadem Bakirkoy Hospital, and Cerrahpasa Medical Faculty, University of Istanbul, Department of Surgery, Istanbul, Turkey, 2Acibadem Bakirkoy Hospital, Department of Surgery, Istanbul, Turkey, 3Acibadem Bakirkoy Hospital, Department of Pathology, Istanbul, Turkey, 4Haseki Research Hospital, Department of Surgery, Istanbul, Turkey

Objective: In a significant proportion of patients, the sentinel lymph node (SLN) is the only involved axillary node. Scoring systems using clinicopathological characteristics have been developed to predict the probability of non-SLN metastases among those patients with a positive SLN. The goal of the present study was to identify factors associated with a positive SLN biopsy and the metastatic involvement of non-SLNs to define a subgroup of patients in whom axillary dissection may be omitted.

Methods: Data was reviewed for 353 patients diagnosed with clinical palpable T1-T3 N0 breast cancer who underwent SLN 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 cytokeratin immuno staining in suspicious cases.

Results: The SLN 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 89 patients (60.5%) were noted to have macrometastases (C > 2 mm). Nineteen patients (13%) 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 micrometastases in sentinel lymph node was only the predicting factor of not having a non-sentinel lymph node metastasis in both univariate and multivariate analysis (OR = 0.24, 95% CI, 0.09-0.65). In subgroup analysis of patients with ITC or micrometastases, patients with T1 tumors were less likely to have nonsentinel lymph node metastasis than the patients with T2-T3 (1.8% vs 12.3-29.4%, p = 0.0067) and presence of lymphovascular invasion (OR = 1.8, 95% CI, 0.88-3.84).

Conclusions: These data 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 offered in patients with small tumor sizes among those with ITC or micrometastasis in SLN. Therefore, validation of nomograms including different clinicopathological factors or biological markers should better be studied in patients with ITC or micrometastasis in SLN.
1643

Predicting Breast Cancer Outcome and Nodal Metastasis by Routine Histopathology Compared to Hormonal Receptor Status and HER2 Overexpression

Janie Wong Grumley, Heather MacDonald, Stephanie Valente, Jessica Rayhanabad, Melvin J Silverstein

Breach 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 subtyping. 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 HER2 status 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.

Conclusions: Easily obtainable histopathologic data, such as nuclear grade, histologic grade, and mitotic grade, are excellent predictors of both nodal positivity and breast cancer specific survival, whereas more costly tests such as 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.

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<td><strong>Histologic Grade</strong></td>
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<td><strong>p-value</strong></td>
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<td>Nuclear Grade</td>
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| 1 | 199/506 (39) | 89%
| 2 | 345/719 (48) | 81%
| Mitotic Grade | | |
| 1 | 13/136 (9) | 98%
| 2 | 244/773 (32) | 91%
| 3 | 329/693 (47) | 81%
| ER | | |
| Positive | 380/986 (39) | 93%
| Negative | 121/313 (39) | 79%
| p-value | 0.12 | 0.0003 |
| PR | | |
| Positive | 317/863 (37) | 87%
| Negative | 184/436 (42) | 82%
| p-value | 0.08 | 0.007 |
| HER2 | | |
| Positive | 87/200 (43) | 76%
| p-value | 0.06 | 0.0005 |
| Negative | 258/702 (37) | 93%

1722

Encysted and Solid Papillary Carcinomas of the Breast
Kristine Widders, Nayana Dekhne, Mitual 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 cause treatment dilemmas for adjuvant treatment. There is only one meta-analysis study of 907 cases recently published concluding that patients with encysted PC having a favorable outcome.

Methods: A retrospective chart review study of 36 patients, diagnosed at our institution with either encysted (n = 28) or solid papillary carcinoma (n = 8), in the period from 2002 to 2010. We had, for purpose of this study, grouped both entities together under a common term “papillary carcinoma (PC).” We arbitrarily classified these patients into three different subgroups: pure papillary carcinoma (PC), PC with adjacent nonpapillary ductal carcinoma in situ (PC-DCIS), and PC with invasive carcinoma (PC-IC). PC-DCIS was put as a separate category as there was DCIS beyond the perimeter of the PC, and we wanted to examine if this affected outcome. The patients groups were statistically analyzed.

Results: In our study, 10 patients had pure PC, 9 had PC-DCIS, and 17 had PC-IC. The mean age at presentation was 67 years (range, 40-92 years). There is a trend toward presenting as palpable mass and a larger size in patients with PC-IC. Twenty-three cases had papillary architecture detected by the diagnostic biopsy. Nine cases diagnosed as PC without invasion on core biopsy had IC detected on resection. We had a mean follow-up of 2.81 years (range, 4 months-8 years). All patients underwent either breast conservation surgery and/or mastectomy. Chemotherapy was given to 4 patients only, and 19 patients received radiation following surgery. None of the cases with pure PC had recurrence. One case of PC-DCIS had local recurrence. Two patients of PC-IC had distant metastases, and one additional case had chest wall recurrence.

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.

1724

The Effect of Preoperative Breast MRI Use on Mastectomy Rate
Jennifer Williams, Mary Politi

Rhode Island Hospital/Brown University, Providence, RI

Objective: MRI in the preoperative management of breast cancer has increased dramatically. Coincidentally, the rate of mastectomy for breast cancer treatment has also increased. The aim of this study was to evaluate the impact of preoperative MRI use on surgical treatment for breast cancer in relation to the publication of the results of ACRIN 6667 in March 2007, the randomized trial supporting preoperative breast MRI use.

Methods: A retrospective chart review of all female breast cancer patients diagnosed at our institution between 1/2005 and 5/2008 was performed. Patients were divided into three time periods based on the timing of publication of ACRIN 6667 trial: Pre-MR (1/2005-1/2006), Transition (2/2006-2/2007), and Post-MR (5/2007-5/2008). Breast MR was routinely ordered as part of the preoperative evaluation of breast cancer patients beginning March 2007. Charts were evaluated for demographic data, breast MRI use and results, breast cancer characteristics and recurrence, mastectomy rate and duration, and post-MR times periods were compared using Pearson chi-square and Fisher’s exact test.

Results: Charts were reviewed for 476 patients divided into 130, 181, and 165 in the pre-MR, transition, and post-MR classifications, respectively. There was no difference in patient age, tumor size, tumor staging, and family history for the three time periods. MRI 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% (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 MRI 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.

1659

3D-MRI and 3D-CT Mammary Lymphography Can Predict the Sentinel Node Metastasis
Koji Yamashita, Kazuo Shimizu, Shinusuke Haga

Department of Surgery, Nippon Medical School, Tokyo, Japan

Objective: 3D-CT mammary lymphography (3D-CT 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 3D-CT MRI with 3D-CT LG to predict the SN metastasis before surgery by the enhanced patterns of SN.

Methods: 3D-CT LG 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 contrast-enhanced 3D-MRI of the breast was performed using 3T MRI by bolus injection of gadolinium. T1-weighted fat-suppressed images were reconstructed to 3D images to show the shape, size and 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 50 patients. The average age was 55.1 years old. The average tumor size was 2.4 cm. The average 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 (62.5%). There was no false-negative study. We performed mastectomy on 8 patients, and the video-assisted breast-conserving surgery on 42 patients. The comparison of 3D-CT LG and 3D-MRI shows the incompatability enhancement on 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 10, and nonenhanced pattern was on 6. 3D-MRI was more sensitive to metastasis by the differentiation of the enhanced patterns of SN. 3D-MRI with 3D-CT LG will become to be more predictive for metastasis than only 3D-CT LG.

Conclusions: 3D-MRI can show the sensitive enhancement of SN guided with 3D-CT LG. The precisely detected SN of 3D-CT LG will be predictable for metastasis by the incompatibility 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.