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

AIM Albotti, NH Ruehl, KM Kurtz, TM Tuttle

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2School of Medicine, Loma Linda University School of Medicine, Loma Linda, CA, 3Brody School of Medicine, East Carolina University, Greenville, NC

Objective: Among patients with unilateral breast cancer, without BRCA mutation, the cumulative 10-year risk of contralateral breast cancer in this cohort was 10%. Our previous study demonstrated that the majority of patients had a contralateral breast cancer that was histologically similar to the primary breast cancer. The majority of patients with unilateral breast cancer who underwent surgery after breast cancer diagnosis were not aware of the contralateral risk of breast cancer and may be at risk of delaying their contralateral prophylactic mastectomy (CPM).

Methods: The majority of patients with unilateral breast cancer who underwent surgery within 30 years of breast cancer diagnosis were not aware of the contralateral risk of breast cancer and may be at risk of delaying their contralateral prophylactic mastectomy (CPM).

Results: The majority of patients with unilateral breast cancer who underwent surgery within 30 years of breast cancer diagnosis were not aware of the contralateral risk of breast cancer and may be at risk of delaying their contralateral prophylactic mastectomy (CPM).

Conclusions: The majority of patients with unilateral breast cancer who underwent surgery within 30 years of breast cancer diagnosis were not aware of the contralateral risk of breast cancer and may be at risk of delaying their contralateral prophylactic mastectomy (CPM).
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, 0.13-14.5). The median number of positive nodes removed was 4 (range, 1-41); the median number of total nodes dissected was 13 (range, 1-48). The median LNR was 0.40 (range, 0.3-1.00). In terms of AJCC categorization, 157 (49.2%) patients were pN1 (1-3 positive nodes), 97 (30.4%) were pN2 (4-9 positive nodes), and 65 (20.4%) were pN2 (≥10 positive nodes). Classifying LNR into low (<0.2), intermediate (0.2-0.65), and high (>0.65) risk categories, 90 (28.2%) were low risk, 119 (38.3%) were intermediate risk, and 101 (34.5%) were high risk. The median follow-up of the cohort was 68.7 months (range, 2.3-498). 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 pT 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.

**TABLE 1:**

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<th>AJCC pT Status</th>
<th>Median Survival (months)</th>
<th>p-value</th>
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<td>Low LNR</td>
<td>106.1 (95)</td>
<td>0.512</td>
</tr>
<tr>
<td>Intermediate LNR</td>
<td>76.4 (70)</td>
<td>0.901</td>
</tr>
<tr>
<td>High LNR</td>
<td>54.2 (45)</td>
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</tbody>
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**FIGURE 1:** Overall survival of pN1 patients stratified by LNR

**FIGURE 2:** Overall survival of pN2 patients stratified by LNR

**FIGURE 3:** Overall survival of pN3 patients stratified by LNR

Table: Margin status and local recurrence rates for invasive lesions following RSL

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<th>Characteristic</th>
<th>Mixt Flap Necrosis (n=56)</th>
<th>No Mixt Flap Necrosis (n=68)</th>
<th>p value</th>
</tr>
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<tr>
<td>Age (years)</td>
<td>51.8 ± 9.77</td>
<td>48.6 ± 10.64</td>
<td>0.1670</td>
</tr>
<tr>
<td>BMI</td>
<td>20.8 ± 3.53</td>
<td>25.4 ± 5.3</td>
<td>0.1350</td>
</tr>
<tr>
<td>Active Smoker</td>
<td>13</td>
<td>100</td>
<td>0.0004</td>
</tr>
<tr>
<td>Tumour size</td>
<td>40.3 ± 12.94</td>
<td>39.5 ± 13.64</td>
<td>0.6647</td>
</tr>
<tr>
<td>Tumour technique</td>
<td>28.04</td>
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<td>-0.0011</td>
</tr>
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<td>Radiotherapy</td>
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<td>0.7103</td>
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</table>

### 1711

**MRI Staging After Neoadjuvant Chemotherapy for Breast Cancer: Does Tumor Biology Affect Accuracy?**

Kendall McGuire, Jorge Toro-Burguete, Hang Deng, Jessica Young, Atilla Soran, Gideon Ariel

*Magen-Womans Hospital of the University of Pittsburgh Medical Center, Pittsburgh, PA*

**Objective:** Magnetic resonance imaging (MRI) has been recommended to monitor the response of breast tumors to neoadjuvant chemotherapy. However, an important question exists in the post-neoadjuvant MRI staging. This study focused on postchemotherapy size estimation as compared to the final surgical pathology size to determine the accuracy and reliability of MRI staging and the impact of HER2 status.

**Methods:** Of 599 patients treated neoadjuvant chemotherapy between 2004 and 2009, 175 had MRI staging before and after chemotherapy. Tumors were classified as ER or PR negative or positive, HER2 positive or negative, or Ki67 index.

**Results:** MRI was accurate in predicting the pathologic tumor size (P = 0.039), with postchemotherapy MRI tumor size being close to or involving the target lesion. Of the 767 malignant lesions excised, final pathology margin status was recorded in 550 (72%); 495 (89%) had positive margins, 36 (6%) had negative margins, and 9 (2%) were classified as close margins (< 2 mm). Close (<2 mm) or positive margin rates were as follows:

- Negative margins (< 2 mm): 51 (9%) vs. 42 (19%) vs. 93 (12%)
- Close margins (≥ 2 mm): 51 (9%) vs. 42 (19%) vs. 93 (12%)
- Positive margins: 93 (12%) vs. 51 (9%) vs. 42 (19%)
- Re-excision of margins: 93 (12%) vs. 51 (9%) vs. 42 (19%)
- Local recurrences: 42 (19%) vs. 93 (12%) vs. 51 (9%)
- Minimal necrosis to recurancy: 51 (9%) vs. 42 (19%) vs. 93 (12%)

**Conclusion:** MRI 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 used for statistical analysis.

**Results:** The mean follow-up was 37.3 months. There were 495 (89%) with positive margins, 36 (6%) with negative margins, and 9 (2%) with close margins. There was no difference in follow-up rates between positive, negative, or close margins.

**Conclusion:** 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 the method of choice for preoperative localization of nonpalpable breast lesions.

**Methods:** Five hundred ninety-two patients underwent MRI staging after undergoing neoadjuvant chemotherapy between 2004 and 2009. Of those, 227 had MRI staging before and after chemotherapy. Tumors were classified as ER or PR negative or positive, HER2 positive or negative, or Ki67 index.

**Results:** MRI was accurate in predicting the pathologic tumor size (P = 0.039), with postchemotherapy MRI tumor size being close to or involving the target lesion. Of the 767 malignant lesions excised, final pathology margin status was recorded in 550 (72%); 495 (89%) had positive margins, 36 (6%) had negative margins, and 9 (2%) were classified as close margins (< 2 mm). Close (<2 mm) or positive margin rates were as follows:

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Scientific Poster Forum Presentations
1689

Triple-Negative Breast Cancer Is Not a Contraindication for Breast Conservation
Farrell C Adkins, Ana Maria Gonzalez-Angulo, Xiudong Lei, Leond F Hernandez-Aya, Jennifer K Litton, Fonda 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 the highest risk of locoregional recurrence (LRR). 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 survivals (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 risk status between the two groups. The mastectomy group had significantly larger tumors, a higher incidence of lymphovascular invasion, and a higher pathological stage. In the entire cohort, a margin index of >5 resulted in a sensitivity of 79% but a specificity of only 45%. A receiver operating curve was created using the derived margin index and the presence or absence of residual disease in the re-excision specimen. Sensitivity and specificity were calculated at various margin indices to determine the optimal margin index.

Methods: We reviewed our prospectively maintained database and identified all patients with DCIS who were treated with attempted BCT from 2004-2009. Only those who had close but negative margins and also underwent re-excision were included in the analysis. Margin index was calculated as follows: margin index = (mm/3) × (mm/3) × (mm/3) × (mm/3) × (mm/3) × 100. A receiver operating curve was created using the derived margin index and the presence or absence of residual disease in the re-excision specimen. Sensitivity and specificity were calculated at various margin indices to determine the optimal 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 true extent 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.

1702

An Effective Intervention for Improving Symptoms and Quality of Life of Female Cancer Survivors: A Randomized, Controlled Study
West Lehman1, Robert Jacob1, Heather Reynolds1, Ronald Gallenkamp2, Frank Vicini2
1Marilyn & Walter I. 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

Objective: To determine the effectiveness of an 8-week interactive intervention that included mindfulness-based stress reduction (MBSR) and cognitive-behavioral therapy (CBT) for improving psychosocial functioning and quality of life in female cancer survivors.

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 Checklist (SCL-90-R). Participants were randomized into intervention or wait-list control groups. Intervention group participants completed MBSR and CBT skills weekly in 2-hour workshops. Subjects practiced daily meditation and recorded daily logs. Assuming a medium effect size of 0.5, a power level of 0.8 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 SSSI subscales (p ≤ 0.0049), 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.
Serum 25-Hydroxyvitamin D and Prognostic Tumor Characteristics in Breast Cancer Patients

Aaron Rickles1, Luke Peppone1, Alissa Huston1, 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 DXscore, TNM staging, ER status, PR status, HER2 expression, and gene expression. Linear regression and ANCOVA were used to calculate correlations and mean values, respectively, between prognostic variables and 25-OH vitamin D levels, while controlling for relevant covariates (age, race, and month of blood draw). Lastly, 25-OH vitamin D levels were dichotomized into optimal (≥32 ng/ml) and suboptimal (<32 ng/ml) categories. Logistic regression was used to calculate odds ratios (OR) for the dichotomous vitamin D groups and each prognostic variable while controlling for relevant covariates.

Results: Non-Caucasian breast cancer patients were significantly more likely to have suboptimal 25-OH vitamin D levels than Caucasian patients (OR = 3.8; p < 0.01). Premenopausal breast cancer patients had significantly higher suboptimal vitamin D levels 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 = 0.07) and significantly 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>Mean 25-OH</th>
<th>SD</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Patients</td>
<td>31.5</td>
<td>13.2</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>33.1</td>
<td>12.9</td>
<td></td>
</tr>
<tr>
<td>Non-Caucasian</td>
<td>22.9</td>
<td>11.3</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 49 and younger</td>
<td>30.0</td>
<td>12.7</td>
<td></td>
</tr>
<tr>
<td>50-64</td>
<td>31.2</td>
<td>12.2</td>
<td></td>
</tr>
<tr>
<td>≥ 65</td>
<td>39.9</td>
<td>15.6</td>
<td>0.15</td>
</tr>
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<td>Menopausal Status</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Premenopausal</td>
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<td>10.8</td>
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<tr>
<td>Postmenopausal</td>
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<td>13.2</td>
<td>0.04</td>
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<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>12.5</td>
<td></td>
</tr>
<tr>
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<td>13.3</td>
<td>0.15</td>
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<tr>
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<td>12.8</td>
<td></td>
</tr>
<tr>
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<td>27.1</td>
<td>12.7</td>
<td>0.34</td>
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<td>13.4</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30.5</td>
<td>12.9</td>
<td>0.04</td>
</tr>
<tr>
<td>Tumor Size</td>
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<tr>
<td>&lt; 0.5 cm</td>
<td>30.7</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>&gt; 0.5-1.0 cm</td>
<td>30.3</td>
<td>14.9</td>
<td></td>
</tr>
<tr>
<td>&gt; 1.0-2.0 cm</td>
<td>31.2</td>
<td>13.3</td>
<td></td>
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<tr>
<td>&gt; 2.0 cm</td>
<td>30.4</td>
<td>12.0</td>
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<td>Positive Lymph Nodes</td>
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<td>No</td>
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<td>14.6</td>
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<tr>
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<td>32.8</td>
<td>12.1</td>
<td>0.55</td>
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<tr>
<td>Oncotype Score</td>
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<tr>
<td>&lt; 18</td>
<td>32.0</td>
<td>11.9</td>
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</tr>
<tr>
<td>18-30</td>
<td>28.0</td>
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<tr>
<td>≥ 30</td>
<td>31.6</td>
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<td>Gene Expression</td>
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<tr>
<td>Luminal A</td>
<td>30.6</td>
<td>12.7</td>
<td></td>
</tr>
<tr>
<td>Luminal B</td>
<td>33.7</td>
<td>13.8</td>
<td></td>
</tr>
<tr>
<td>Basal-like</td>
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<td>12.0</td>
<td></td>
</tr>
<tr>
<td>In situ</td>
<td>38.8</td>
<td>13.4</td>
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</tr>
<tr>
<td>Season of Blood Draw</td>
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<td>Winter/Spring</td>
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<td>13.4</td>
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<tr>
<td>Summer/Autumn</td>
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<td>13.7</td>
<td>0.37</td>
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</table>

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>Optimal (≥ 32 ng/ml)</th>
<th>Sub-optimal (&lt;32 ng/ml)</th>
<th>OR*</th>
<th>95% Confidence Interval</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
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<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>68</td>
<td>61</td>
<td>47.3%</td>
<td>1.00</td>
<td>Referent</td>
</tr>
<tr>
<td>Non-Caucasian</td>
<td>5</td>
<td>17</td>
<td>77.6%</td>
<td>1.29</td>
<td>0.03</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>≤ 49 and younger</td>
<td>20</td>
<td>33</td>
<td>62.3%</td>
<td>1.00</td>
<td>Referent</td>
</tr>
<tr>
<td>50-64</td>
<td>25</td>
<td>51.0%</td>
<td>24</td>
<td>0.49</td>
<td>0.07</td>
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<tr>
<td>≥ 65</td>
<td>29</td>
<td>55.8%</td>
<td>23</td>
<td>0.07</td>
<td>0.06</td>
</tr>
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<td>Menopausal Status</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premenopausal</td>
<td>65</td>
<td>55.1%</td>
<td>44.0%</td>
<td>1.00</td>
<td>Referent</td>
</tr>
<tr>
<td>Postmenopausal</td>
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<td>26.5%</td>
<td>73.5%</td>
<td>3.46</td>
<td>1.46</td>
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<td></td>
<td></td>
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<td>49.6%</td>
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<td>52.9%</td>
<td>47.1%</td>
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<td>Triple Negative</td>
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</tr>
<tr>
<td>No</td>
<td>53</td>
<td>58.6%</td>
<td>50.4%</td>
<td>1.00</td>
<td>Referent</td>
</tr>
<tr>
<td>Yes</td>
<td>6</td>
<td>27.8%</td>
<td>72.2%</td>
<td>0.40</td>
<td>0.01</td>
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<td>Invasiveness</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12</td>
<td>68.7%</td>
<td>31.3%</td>
<td>1.00</td>
<td>Referent</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>45.0%</td>
<td>55.0%</td>
<td>0.83</td>
<td>0.01</td>
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<tr>
<td>Gene Expression</td>
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<tr>
<td>Luminal A</td>
<td>41</td>
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<td>50.0%</td>
<td>1.00</td>
<td>Referent</td>
</tr>
<tr>
<td>Luminal B</td>
<td>13</td>
<td>46.5%</td>
<td>53.5%</td>
<td>0.09</td>
<td>0.40</td>
</tr>
<tr>
<td>Basal-like</td>
<td>3</td>
<td>26.7%</td>
<td>73.3%</td>
<td>3.39</td>
<td>0.01</td>
</tr>
</tbody>
</table>

*Adjusted for age, race, and month of blood draw
Poster Presentations
1688 Compromised Margins Following Mastectomy for Stage I-III Breast Cancer Fatema Al Mushawbeh, Rebecca L.Aft, William E Gillanders, Timothy J Eberlein, Julie A Margenthaler McMaster University School of Medicine, St. Louis, MO

Objective: Margin status is a risk factor for local recurrence. Although re-excision for positive margins is standard in patients undergoing lumpectomy, it is rarely performed for positive margins following mastectomy. The purpose of this study was to examine the difficulties 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: Two hundred forty 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 postoperative outcomes, including a 93% survival rate, are related to the fact that re-excision is rarely performed.

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

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

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

Methods: Participants were part of a larger study addressing QoL, spiritual and emotional well-being, physical performance, neuroactivation, and immunologic resilience in women newly diagnosed with breast cancer. Women with cancer were treated with breast preservation and diagnosis assessed with Adjutant! Online. Those diagnosed with breast cancer or diagnosed with any other cancer (except skin cancer) in the previous 5 years were excluded. Measures included the Hope Quality of Life Scale, the Bottomley Social Support Scale, the PHQ-9 Patient Health Questionnaire to assess depression, the National Comprehensive Cancer Network Distress Management Screening Measure, the Spiritual Involvement & Beliefs Scale, the CogState Paired Associate Learning Test, the STAI - State Anxiety short form, and Self-Reports of Cognitive Functioning and Sleep Quality. A multiple regression analysis (SAS v9.2) was performed to investigate the predictive value of the diagnosis, mood, social support, spirituality, and cognitive functioning on QoL, using a priori variables of age, income, and education level.

Results: Fifty-eight women newly diagnosed with breast cancer (DCIS or ductal lobular breast cancers) and 70 benign controls were assessed, with an average age of 55.8 years (range, 30-88; sd, 8.7). The groups were comparable on age, education, income, race, and marital status. Higher overall QoL was significantly associated (F = 13.20; p < .0001; adjusted R² = .96) with older age (p < .0009), increased social support (p < .0003), lower depressed mood score (p < .03), lower overall distress (p < .0001), and higher levels of spirituality (p < .02). Measures of education, income, cognitive functioning, state anxiety, and sleep quality did not predict overall QoL. Although the Adjutant! Online score was not related to overall QoL, it was associated with lower social and spiritual QoL subscale scores.

Conclusions: Women's perception of their QoL shortly after a breast biopsy is strongly related to their sense of social support, mood, spirituality, and self-reported level of distress. Younger women appear to be less satisfied with their QoL during this period, though strength of spirituality and social networks appear to be significant moderating factors and may represent important avenues for intervention.

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

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

Methods: During the period from 2004 to 2009, breast cancer patients were selected from the tumor registry database. A subset of 583 women, ages 40-49, were included. Cancer diagnosis was based on invasive or ductal carcinoma in situ (DCIS). In the latter group, DCIS was either confirmed by needle biopsy or confirmed by positive margins on a mastectomy specimen. Those ever diagnosed with breast cancer were treated with breast conservation therapy, and finally, breast surgery was performed in women with invasive breast cancer.

Results: Of 284 patients, 284 (97%) patients had positive mammograms and mammography was the most common diagnostic test (92%). In women newly diagnosed with breast cancer between ages 40 to 49, screening mammography identified 42% (51%) breast cancers. Tumor histology included carcinoma, papillary cancers, and 1 adenoid cystic carcinoma.

Conclusions: During the period from 2004 to 2009, screening mammography identified more than 79% of the breast cancers in women ages 40 to 49 at our institution.

1639 The Success of a One-to-One Mentoring Support Service for Breast Cancer Patients Amanda L. Ainn, Virginia R. Finn, Amanda L. Kang Medical College of Wisconsin, Milwaukee, WI

Objective: After Breast Cancer Diagnosis (ABCD) is a Wisconsin-based nonprofit telephone mentoring service for patients recently diagnosed with breast cancer. As a volunteer organization, ABCD gives support and hope to women who have had personal experiences with breast cancer as a patient or family/friend of a patient, to provide personalized information and emotional support, focusing on issues of survivorship in breast cancer patients since the purpose of the study was to determine the effectiveness of a one-to-one mentoring support service and identify areas of improvement to better meet the needs of breast cancer survivors.

Methods: ABCD has conducted three mentor effectiveness studies since its inception, the most recent occurring in October 2006. The mentor effectiveness study consisted of a 5-minute telephone interview, which included evaluations of the ABCD organization, its coverage of breast cancer, and the accessibility and personal quality of the mentor. The respondents were asked to evaluate the attributes of ABCD on a 5-point Likert scale, where 1 is “Strongly Disagree” and 5 is “Strongly Agree.”

Results: Of the 139 respondents, 41% reported an estimated relationship with their mentor for 6 months to 1 year. Ninety-six percent of respondents would refer a breast cancer patient to ABCD and 60% would consider being mentors. The mean rating on the most recent survey concerning the helpfulness of the program to the respondent was 4.6 and 3.84 for helpfulness to the respondent’s family members. When compared to the previous two studies in 2002 and 2004, the confidentiality of the discussion had improved, with a higher percentage of respondents believing the confidentiality of the discussion had been maintained. As shown above, the confidentiality of the discussion had improved, with a higher percentage of respondents believing the confidentiality of the discussion had been maintained. As shown above, the confidentiality of the discussion had improved, with a higher percentage of respondents believing the confidentiality of the discussion had been maintained. As shown above, the confidentiality of the discussion had improved, with a higher percentage of respondents believing the confidentiality of the discussion had been maintained.
**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 a positive SLN 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 (60%). 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 metastasis size of 9.6 mm for patients with positive SLNs at diagnosis. In one case, the mean size of the axilla was significantly larger in the node-negative cases than node-positive 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 and additional nodal disease on completion axillary lymph node dissection. 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.

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

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

**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 (T1-T4) with no palpable/radiological apparent axillary lymphadenopathy. Patients with axillary clearance in the screen-detected population.

**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 clearance. Sixty-eight (98%) 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.

**1721**  
**Which is a Better Predictor of Outcome After Neoadjuvant Chemotherapy: Microscopic Disease in Bone Marrow or Lymph Nodes?**  
Arvindan Bhattacharyyar, Sai Leela Sarak, Shruti Kharsnurham, Ashutoosh K Lodhi, Carolyn S Hall, Henry M Kuerer, Anthony Lucci  
University of Texas MD Anderson Cancer Center, Houston, TX

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

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

**Results:** We prospectively evaluated 96 patients. Mean age was 51 years and median follow-up 25 months. Nine percent had T1; 34%, T2; 23%, T3; and 34%, T4 tumors. Prior to NACT, 26% were N0; 34%, N1; 4%, N2; and 42%, N3. Fifty-seven percent (52/92) had pathologically positive LNs removed at the time of surgery, of which 19% (10/52) had micrometastatic LNs. DTCs were identified in 27% (24/88) of patients post-NACT. No significant associations were observed between DTCs and LN positivity or any other clinicopathologic variables. Twenty-one percent (5/24) of DTC positive patients died (log-rank, P: 0.02), compared to 20% (2/10, P = 0.27) of patients with micrometastatic LNs. The Cox proportional hazard ratio (HR) for DTCs was 4.93 (1.18-20.66, P = 0.035); whereas micrometastatic LNs had HR of 2.65 (0.53-13.17, P = 0.23).

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

**1648**  
**Receptor Changes in Metachronous Breast Cancer--Our 10-Year Experience**  
Jasmeet Bhattular, Linda Dubey, Lorenzo Ferguson, Yousif Goriel, Sumet Silapaksan, 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 the response to therapy.

**Methods:** Reviewed charts of 108 women diagnosed and treated for primary breast cancer presenting with metachronous cancer over the past 10 years. The significant factors analyzed were age, grade, size, location of the tumor, hormone receptor status, Her2, and treatment received. Patients with metastasis and regional recurrence were excluded.

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

**Conclusions:** Most metachronous tumors retained the ER+/PR+ expression patterns of the primary tumor irrespective of the treatment for the primary tumor. Half of primary tumors Her2 expression was lost in metachronous tumors most probably due to Herceptin therapy. Metachronous tumors are least likely with ER-/PR+ primary tumor.

**Receptor patterns in primary and metachronous breast tumors**

<table>
<thead>
<tr>
<th>ER/PR and Her 2 Receptor Status</th>
<th>Number in Primary Tumor</th>
<th>Number Retained in Metachronous Tumor</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER+/PR+ to ER+/PR+</td>
<td>35</td>
<td>24</td>
<td>69%</td>
</tr>
<tr>
<td>ER-/PR- to ER-/PR-</td>
<td>49</td>
<td>41</td>
<td>84%</td>
</tr>
<tr>
<td>PR- to ER+/PR+</td>
<td>22</td>
<td>16</td>
<td>73%</td>
</tr>
<tr>
<td>ER+ to ER-/PR-</td>
<td>35</td>
<td>9</td>
<td>25%</td>
</tr>
<tr>
<td>ER+/PR+ to ER+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER-/PR- to ER+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Her 2+ to Her 2+</td>
<td>16</td>
<td>8</td>
<td>50%</td>
</tr>
<tr>
<td>Her 2 - to Her 2 -</td>
<td>31</td>
<td>22</td>
<td>71%</td>
</tr>
</tbody>
</table>
Preoperative Predictors of Nipple-Areolar Complex Involvement in Patients Undergoing Mastectomy for Breast Cancer

Julie N. Bilhar, Amyly C. Doque, Richard J. Gray, Nabil Wassef, Barbara A. Peacock

Mayo Clinic in Arizona, Phoenix, AZ

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

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

Results: A total of 45 nipple-sparing, 107 skin-sparing, and 240 standard mastectomies were evaluated. Two attempted nipple-sparing mastectomies were converted to skin-sparing mastectomies due to positive frozen section. The overall incidence of NAC involvement was 16% (n = 62). Eighty-five cases (22%) had patients- or physician-determined clinical involvement of the NAC, of which pathology confirmed N+ in 38 (45%), resulting in a 61% sensitivity, 86% specificity, 45% positive predictive value (PPV), and 92% negative predictive value (NPV). nipple retraction and retraction of the NAC, but these were not statistically significant. Pathology results did not bear any influence on NAC involvement.

Conclusions: The only significant preoperative predictors of pathologic NAC involvement are the presence of clinical exam findings and imaging that demonstrates extension to the NAC. The absence of these factors conveyed a 38% sensitivity, 96% specificity, 62% PPV, and 89% NPV. The N+ group had larger tumors than those without NAC involvement (NI–). For nipple-sparing mastectomy, pathology was determined by sampling the nipple base. Continuous variables were compared using two-sample t tests, and categorical variables were compared using chi-square tests. A multivariate analysis was performed to determine the factors most predictive of NAC involvement.

Table. NAC involvement according to tumor-to-nipple distance

<table>
<thead>
<tr>
<th>Tumor-to-Nipple Distance by Imaging</th>
<th>NAC Involvement</th>
<th>NAC Involvement</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>&lt;2 cm (n = 65)</td>
<td>59%</td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td>≥4 cm (n = 88)</td>
<td>86%</td>
<td>14%</td>
<td></td>
</tr>
</tbody>
</table>

629
Comparative Prognostic Significance of Sentinel Lymph Node Biopsy and Axillary Lymphadenectomy in Carcinoma of the Breast

Aaront Segall1,2, Elesh Bizek2, Ailay Kegalay2

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

Objectives: It has been hypothesized that the enhanced pathologic assessment for nodes identified by lymphatic mapping/sentinel lymph node biopsy will identify patients with small metastases, resulting in a stage migration and better outcomes for the patient.

Methods: An Institutional Review Board-approved retrospective analysis of a prospectively maintained database of breast cancer patients was searched and all node-negative women were identified. The demographics of these cohorts were compared using chi-square analyses. The Wilcoxon signed rank test was used for statistical analysis.

Results: Of 267 patients, 57 patients (21%) were found to have pure DCIS, and 5 (8%) had microinvasive disease associated with DCIS.

6162
Sentinel Lymph Node Biopsy in Pure DCIS: Is It Necessary?

DeMartini2, Robert Guitierrez2

1Academca im BRE BiiKpny, Departement of Surgery, Istanbul, Turkey, 2Haseki Research Hospital, Department of Surgery, Istanbul, Turkey, 3Academca im BRE BiiKpny, Department of Pathology, Istanbul, Turkey, 4Academca im BRE BiiKpny and University of Istanbul, Cerrahpasa Faculty of Medicine, Istanbul, Turkey

Objectives: Sentinel lymph node positivity ranges from 1.4% to 13% in pure ductal carcinoma in situ (DCIS) to the different examination methods such as H&E or immunohistochemistry. Yet sentinel lymph node biopsy (SLNB) in patients with pure DCIS has been a matter of debate. In the present study, our aim was to identify factors in a single institutional series to select patients who may benefit from a SLNB.

Methods: Of 637 patients with breast cancer between July 2000 and July 2010, 62 patients (9.7%) were diagnosed with pure DCIS or DCIS associated with microinvasion 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 cytoelastic immunostaining in suspicious cases.

Results: Of 62 patients, 57 patients (92%) were found to have pure DCIS, and 5 (8%) had microinvasive disease associated with DCIS. Median age was 51 (range, 30-79). Of patients with pure DCIS, mastectomy was performed in 28 patients (49%), whereas 29 patients (51%) underwent breast-conserving surgery. Thirty-six patients (56%) had pure DCIS without SLNB, and 3 of them had a positive SLNB. Of patients with SLNB positivity, 2 patients (5%) were found to have isolated tumor cells (ICs), whereas one patient had macrometastasis (2.8%). Axillary lymph node dissection was performed in one patient with ICT, and in one patient with macrometastases. In all cases with SLNB metastases, only one sentinel lymph node involved, occupying the entire tumor base, whereas all the other sentinel nodes were found to be negative. 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 progesterone receptor status, or cribriform 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 presence of importance of preoperative ICT in SLNs has not been clarified yet, it may be reasonable to perform SLN in selected patients with pure DCIS.

6164
Can Surgeons Avoid Preoperative Wire Localization Using Sonographically Visible Breast Biopsy Marker Clips?

Kristie Cahan1, Peter Eby2, Benjamin Anderson3, Gary Mann1, David Byrd2, Brenda Rutland4, Wendy White1,5,6,7,8,9

1University of Washington, Department of Surgery, Seattle, WA, 2University of Washington, Department of Radiation, Seattle, WA, 3Fred Hutchinson Cancer Research Center, Department of Clinical Statistics, Seattle, WA, 4Department of Surgery, Seattle, WA, 5Department of Biostatistics, Fred Hutchinson Cancer Res, 6University of Washington, Department of Nursing, 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 visualization is enhanced using 3D ultrasound, and if ultrasound visualization 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 visualizations were rated by surgeons preoperatively and intraoperatively from 1 (not visible) to 5 (clearly visible), with 4 or 5 deemed adequate. 2D and 3D visualizations 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 (66.7%) who underwent lumpectomy had 2D ultrasound clip visualization rated 4 or 5 preoperatively, while 6 of these 12 (50%) also had adequate clip visualization intraoperatively. There were 3 clips that had clip and lesion visualization rated 4 or 5 preoperatively that also had clip and/or lesion visualization rated 4 or 5 at surgery. Surgeons consistently rated clip and lesion visualization rated 4 or 5 with 2D ultrasound (p < 0.01). Of 44 paired 2D and 3D clip assessments, 3D visualization was better by 1 rank level in 4 cases, but 2D was better by 1-5 levels in 17 (39%). For 3D visualization, 3D visualization 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 visualization of 4 or 5 at both time points, final margins were adequate for 3 (60%) and inadequate for 2 (40%).

Conclusions: Intraoperative 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 visualization eliminate the possibility of inadequate surgical margins for malignant lesions.
The present study demonstrates the recent experiences in diagnosis, surgical management and clinical follow-up of this disease.

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

Results: The mean follow-up was 34.0 months (range, 2.7-179.3). The median age of the patients was 43 (range, 11-72). Tumor size ranged from 1.0 cm to 30.0 cm, with a median of 6.1 cm. The most commonly performed surgical procedures were local or wide excision (148 case, 90.2%), mastectomy and MRM in 16 cases (9.8%). The pathologic diagnosis included 82 (50.0%) benign, 41 (25.0%) borderline, and 41 (25.0%) malignant phyllodes tumor. The tumor margin was infiltrating in 44 (26.8%) cases and pushing in 115 (70.1%) cases. A local recurrence was observed in 27 (16.1%) patients and distant metastasis developed in 4 patients with malignant phyllodes tumor. Bone metastases observed in two patients and lung metastasis developed in one patient. Both bone and lung metastases were detected in one patient. The 5-y disease-free survival rate of each histologic grade was 78.6%, 67.3%, and 37.9%, respectively (benign vs malignant, p = 0.025). A disease mortality occurred in only malignant phyllodes tumor patient and the 5-yr overall survival rate was 88.1%. Risk factors for local recurrence of a phyllodes tumor were a tumor size (p = 0.001) and an invasive resection margin (p = 0.007). Distant metastasis is associated with malignant histology (p = 0.002).

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

1624
Is Accelerated Partial-Breast Irradiation Safe in Patients With an Intermediate or High Oncotype DX Score?
Abigail Collett, Thomas Frazier, M Catherine Goodwin, Andrea V Barrio
Bryn Mawr Hospital, Bryn Mawr, PA
Objective: Oncotype DX, a 21-gene assay, assesses the risk of distant recurrence in patients with estrogen receptor positive, node-negative breast cancer. A recently published study demonstrated that recurrence score (RS) is also an independent predictor of local recurrence (LRR). The goal of our study was to assess whether accelerated partial breast irradiation (APBI) was equivalent to whole-breast radiation in patients deemed to have high-risk tumors by Oncotype DX.

Methods: An IRB-approved retrospective chart review was conducted between April 2004 and December 2008. Forty-five patients (pts) with invasive breast cancer were identified; all had an intermediate or high RS (>18) and received APBI or whole-breast radiation following breast-conserving surgery. APBI was administered via balloon catheter brachytherapy; one pt received 3D conformal partial breast radiation. The primary endpoint was time to LRR. The secondary endpoints were time to distant metastases, and contralateral breast cancer.

Results: Of 45 pts, 36 had an intermediate RS and 9 had a high RS. Median age at diagnosis was 61. Mean tumor size was 1.52 cm (range, 0.3-4.5cm). One pt was node positive. Ninety-six percent of pts had negative surgical margins. Forty-four (98%) received adjuvant hormonal therapy and 12 (27%) received chemotherapy. Eleven of 36 pts received APBI; 1 pt received APBI with an intermediate RS received whole-breast radiation, 24 (67%) had APBI, and 1 (3%) had 3D conformal partial breast. Three of 9 (33%) with a high RS received whole-breast radiation, and 6 (67%) had APBI. There were no local (in-breast) recurrences at a median follow-up of 3.2 years. Two pts (4%) developed distant disease; one was a synchronous regional and distant metastases and one was an isolated distant metastases. Both pts had an intermediate RS; both were treated initially with APBI. No pt developed a contralateral breast cancer.

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

1757
BRCA Testing by Specialty–A Regional Review
Therese E Cusick
University of Kansas - Wichita, Wichita, KS
Objective: BRCA status significantly influences the surgical recommendations for a newly diagnosed cancer patient. The testing may be done by the surgeon, medical oncologist, or referral to a genetic specialist. Surgeons began testing in the state of Kansas out of necessity. In an effort to determine if Kansas fell within standard guidelines for testing, a review was performed of genetic testing by specialty for Kansas, as well as the surrounding states.

Methods: Numbers of BRCA tests ordered on affected patients during the years of 2003-2006 were obtained. The tested were stratified by specialty to calculate the percentage of BRCA tests ordered by each specialty. The specialty was then compared to the national percentage of tests ordered by a medical geneticist, as might be expected. Surgeons and medical oncologists were analyzed.

Results: Although the number of cancers by state did not change significantly, the number of tests ordered by a medical geneticist, as might be expected. Surgeons and PPV of 85% in 54 available patients. PPV did not appear to affect any variable except for improving PPV to 95% in patients under the age of 50. The overall accuracy of MBI was 70% with an NPV of 84% and a PPV of 77% in 40 available patients. PPV was also increased for patients under the age of 50. When these methods are combined, the overall PPV was 40% for any two methods in agreement trend 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 PPV were compromised even further.

Table 1. Clinicopathological features of patients with metastatic disease

<table>
<thead>
<tr>
<th>Case no.</th>
<th>Age</th>
<th>Histology</th>
<th>Tumor Size(cm)</th>
<th>LV+ Radiation</th>
<th>OncotypeDX Score</th>
<th>Off (yrs)</th>
<th>Site of Distant Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>63</td>
<td>IDC</td>
<td>2.60</td>
<td>No Partial</td>
<td>10/Intermediate</td>
<td>1.13</td>
<td>Liver</td>
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<tr>
<td>45</td>
<td>71</td>
<td>IDC</td>
<td>2.00</td>
<td>Yes Partial</td>
<td>10/Intermediate</td>
<td>2.21</td>
<td>Axillary, lung, mediastinum</td>
</tr>
</tbody>
</table>

1726
Accuracy of Clinical Exam, Digital Mammogram, Ultrasonad, and MBI in Determining Post-Neoadjuvant Pathologic Tumor Response in Operable Breast Cancer Patients
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Objective: The purpose of this study is to determine the accuracy and predictive value of clinical examination and breast imaging for a complete pathological response (cPR) in breast cancer patients following neoadjuvant chemotherapy for locally advanced operable breast cancer.

Methods: An IRB-approved retrospective review was performed of data collected from patients treated with neoadjuvant chemotherapy or hormonal therapy before 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 MBI. 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 pathologic diagnosis although it was evaluated separately.

Results: A total of 62 tumors in 61 patients with an average age of 56 (range, 34 to 87) were evaluated. The overall accuracy of CBE compared to the final pathological diagnosis was 54% with a NPV of 28% and a PPV of 87% in 52 available patients. Age over 50 increased accuracy to 70% with an increased NPV of 50% and slightly decreased PPV of 83%. For patients younger than 50, accuracy decreased to 32% due to the reduced NPV of 12%. The overall accuracy of DM was 71% with an NPV of 30% and a PPV of 82% in 49 available patients. Age greater than 50 improved NPV to 43% but did not affect accuracy or the other predictive variables. The overall accuracy of BUS was found to be 80% with an NPV of 23% 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 MBI was 70% with an NPV of 84% 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 PPV was 40% for any two methods in agreement trend 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 PPV were compromised even further.

Table 1. THE TEST Clinical Exam Digital Mammogram Breast Ultrasound Breast MBI

| Overall accuracy | 54 | 71 | 80 | 70 |
| Overall PPV | 87 | 82 | 85 | 77 |
| Overall NPV | 28 | 30 | 33 | 44 |

The overall accuracy of 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 PPV were compromised even further.
Correlation of Ductal Lavage Cytology With Ductoscopy-Directed Duct Excision Histology in Women at High Risk for Developing Breast Cancer: A Prospective Single-Institution Trial

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1Washington University, St. Louis, MO, 2Missouri Baptist Medical Center, St. Louis, MO, 3Cleveland Clinic, Cleveland, OH, 4methods, and institutional review board approval was obtained.

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

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 mutation, or at least one relative of age <50 diagnosed with breast cancer. 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, cytopathologic and histologic findings, and outcomes. Descriptive statistics were utilized for data summary and were compared using Fisher’s exact test.

Results: We enrolled 102 women; 93 (91%) were Caucasian. Their median age was 49 years (range, 14-73) with a median follow-up of 8 months (range, 5-90). Overall, 27 (26%) had atypical ductal lavage cytology (Group 1), while 75 (74%) had benign cytology. Subsequent duct excision in Group 1 patients revealed benign ductal histology in 11 (44%), papillomas in 9 (36%), ADH in 4 (16%), and ductal carcinoma in situ in 3 (11%). At follow-up, three patients developed breast cancer, including one Group 1 patient with atypical ductal lavage cytology but benign ductal histology and two Group 2 patients. There were no differences between Groups 1 and 2 with respect to patient demographics, risk level, Gail scores, or risk for subsequent breast cancer (p > 0.05).

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


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

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

Results: During the 10-year time period, 158 women were treated for breast cancer at our institution. Of these, 320 (20%) were between the ages of 40 and 49, 9 patients were excluded from the study due to incomplete records. Of the remaining 311 women, 141 (47%) underwent mammographic screening before they were diagnosed with a MDC, the other 166 (53%) were diagnosed by clinical symptoms or nonmammographically detected cancer (NMDC). The median tumor diameter of the MDC group was 20 mm significantly smaller than the NMDC group’s 40 mm (p = 0.001). Women with MDC had a significantly lower incidence of lymph node-positive cancer than the NMDC group, 28/113 (24.78%) vs 85/130 (65.39%) (p = 0.001). Women with MDC had a significantly higher incidence of a family history of breast cancer than the NMDC group, 14.62% and 25%, respectively (p = 0.005). Five-year disease-free and overall survival rates were determined for both groups. Five-year disease-free survival was 94% (87%, 97%) for the MDC group and 71% (62%, 78%) for the non-MDC group. Five-year overall survival rates for each group were 97% (82%, 99%) for the MDC and 78% (69%, 85%) for the non-MDC. In multivariate analysis mammographic screening, mammographic detection of smaller tumors had less nodal metastasis resulting in improved survival supporting annual mammographic screening in this age group.

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

Kernoch De, Deloucas Costas, Fabio Pianaro, Edmundo Rivero, Agustín A García, Renau Serbiá
1Saddleback Medical Memorial Center, Laguna Hills, CA, 2John Muir, Walnut Creek, CA, 3Comprehensive Breast Center, San Diego and Sharp Memorial Hospital, San Diego, CA, 4The Methodist Hospital/Weill Cornell University, Houston, TX, 5University of Southern California Los Angeles, CA, 6Rockwood Clinic, Spokane, WA

Objective: MammaPrint is the MammaPrint 70-gene expression profile system is established as a powerful predictor of disease outcome in breast cancer. In addition, TargetPrint, a microarray-based test that measures the mRNA expression level of ER, PR, and HER2 was developed as an objective and more quantitative assessment of tumor receptor status versus immunohistochemistry (IHC) alone. In a Kaplan-Meier analysis of 317 untreated patients who would have received adjuvant chemotherapy according to NCCN guidelines, classification on MammaPrint showed that low-risk patients have an excellent breast cancer-specific survival (BCSS) (de Snoo et al. ASCO 2009). In the present study, the 70-gene MammaPrint profile was measured in a U.S. breast cancer patient cohort to determine how MammaPrint compared to treatment advice according to NCCN consensus guidelines and how TargetPrint results compare to IHC/FISH.

Methods: MammaPrint results were evaluated in fresh tumor samples from 89 breast cancer patients (clinical T1-N0-D0-M0; median age, 64 [range, 40 to 95] years) collected by core needle biopsy (6) or from available tumor tissues (83) in 6 of 8 planned U.S. hospitals from July 2008 to September 2010 (study protocol MP 090). We compared treatment advice as recommended by NCCN guidelines and classification according to the 70-gene MammaPrint profile. A direct comparison was also made between MammaPrint and the Oncotype DX assay in a subset of patients. In addition, we compared IHC/FISH assessments of ER, PR, and HER2 with gene expression readsouts by TargetPrint.

Results: According to NCCN treatment recommendations, one patient did not require any adjuvant treatment (tumor size 0.6 to 1 cm, grade 1 disease, no lymph node involvement), this patient was also classified as low risk by MammaPrint. For five patients, NCCN recommendations could not be assessed due to a missing clinical parameter on pathology and one low risk, according to MammaPrint. For the remaining 83 patients, NCCN guidelines recommended adjuvant endocrine therapy plus adjuvant chemotherapy (75) or recommended considering chemotherapy (8); 18 of these patients were classified as low risk by MammaPrint and the remaining as high risk. Comparison of microarray receptor results with IHC/FISH performed at the U.S. hospitals indicated similar results with a concordance of 96% for ER, 95% for PR, and 96% for HER2. For 11 patients, Oncotype DX assay was also performed, resulting in 1 patient classified as low risk and 10 patients classified as intermediate risk. All these patients were high risk, according to MammaPrint.

Conclusions: For the majority (93%) of these 89 breast cancer patients from 6 U.S. hospitals, NCCN guidelines either recommended or suggested considering treatment with cytotoxic adjuvant chemotherapy, whereas MammaPrint indicated a low risk of recurrence in 22% of these cases. Integration of the 70-gene MammaPrint profile into clinical risk assessment and adjuvant treatment advice could provide added value for the management of early-stage breast cancer and potentially avoid unnecessary chemotherapy in low-risk patients.
A Positive Intramammary Lymph Node Does Not Mandate a Complete Axillary Node Dissection

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Objective: Sentinel lymph node (SLN) biopsy is the standard method to stage the axillary regional nodal basin. Intramammary nodes (IMLNs) 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. Published literature as well as data from an updated review of our institutional database.

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

Results: Twelve publications met the selection criteria; this included six retrospective studies, five case reports, and a letter to the editor. From an initial pool of 27,328 breast cancer cases, 14 cases had a positive IMLN, a negative axillary SLN biopsy and also underwent a CALND. We next identified seven patients from case reports who also had a positive IMLN, negative SLN biopsy and underwent a CALND. In all 21 cases, the CALND was negative and the status of the axilla was reliably determined by the axillary SLN. In essence there were no false-negative axillary SLNs based on pathologic analysis of the CALND. A review of our institutional breast surgical database resulted in 40 additional cases of IMLNs that were surgically resected; in 10 cases the IMLN was positive. 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. Two hundred and thirty patients with the same criteria as above were identified, and pathology database was also performed. Patients with the same criteria as above were identified, and pathology reports were reviewed to assess the status of the SLN, IMLN, and CALND.

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

1630

Modern Surgical Approach to Paget Disease

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Objective: Paget’s disease (PD) constitutes between 1 and 3% of all breast malignancies. The small number of published reports comparing IMLNs and SLN biopsy. A total of 366 publications were identified meeting the search criteria. Manuscripts were reviewed to identify the status of the IMLN, SLN, and CALND in cases with a positive IMLN. 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, co-morbidities, and extracted questionnaire data were reviewed. Patients with a positive IMLN and a negative axillary SLN that underwent a CALND were identified. With IRB approval, a review of our prospective institutional breast surgical database was also performed. Patients with the same criteria as above were identified, and pathology reports were reviewed to assess the status of the SLN, IMLN, and CALND.

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

1630

Upper Extremity Lymphedema Rates Following Surgery for Breast Cancer

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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 (ALND). The American College of Surgeons Oncology Group (ACOSOG) defined LE as a 2 cm or greater change in arm circumference in the breast. 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 circumferences were measured by the surgeons 10 cm above and below the olecranon process. Bilateral arm volumes were calculated using a lymphedema specialist’s protocol of 5 circumference measurements at 10-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, four (57%) were identified by a 2-cm increase in arm circumference. The correlation between measurements greater than 1 cm and subjective symptoms of LE was 0.52.

Conclusions: In this long-term follow-up study of breast cancer patients, the volumetric analysis was not an accurate measure of clinically significant LE. This study verifies that the previously published guideline by ACOSOG using a 2-cm change in arm circumference is an accurate measure of LE, although five measurements may be necessary to identify patients with symptomatic LE. A 1-cm change in circumference may be useful in identifying LE before patients become symptomatic, which would enable earlier intervention. Larger studies are necessary.
Results:reasons (eg, personal preference, contraindications for radiation) were excluded from the (BCT) and had BSGI were evaluated to determine how many ultimately had mastectomies. Initially considered by the breast surgeon to be eligible for breast-conserving therapy

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 performed due to findings on BSGI. The rate of additional DCIS of mammography may have identified all of the cancers identified by BSGI was slightly higher than rates previously reported for MRI. Of those patients thought to be eligible for BCT, 6.8% had mastectomies as a result of BSGI, and all of these were accurately identified as having disease not amenable to BCT, however, BSGI appeared to be less effective in the identification of patients who need mastectomy due to extensive DCIS. Larger studies are necessary to evaluate the role of BSGI in surgical management and to compare it to MRI.

A Comparison of Intraoperative Versus Traditional Specimen Radiography in Patients Undergoing Breast-Conserving Surgery for Nonpalpable Breast Lesions

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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 radiographic device, image acquisition occurs within seconds and the surgeon can orient the specimen and evaluate the specimen immediately. The purpose of this study was to compare the use of mammography radiographic device, such as the KUBTEC™, results 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™ 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 in-situ cancers. 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 = .25). In comparing re-excision rates, the KUBTEC™ group had significantly fewer re-excision rates 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 in patients undergoing breast-conserving surgery for nonpalpable breast lesions.
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: The American Society for Radiation Oncology (ASTRO) issued a consensus statement in 2009 regarding patient (pt) selection for accelerated partial breast irradiation (APBI) following breast-conserving surgery (BCS) for early-stage breast cancer. Pts with invasive lobular carcinoma (ILC) fall into a “cautionary” group who are not recommended for self-patient experience with APBI in pts with ILC to determine safety and patterns of recurrence.  
Methods: From January 2005 to November 2009, 24 pts with ILC treated with BCS and APBI were identified. Twenty-three pts received APBI via balloon catheter brachytherapy; one pt received 3-D conformal radiation therapy (3-D CRT) and PBI. The retrospective end point was time to locoregional recurrence (LRR). Secondary endpoint was time to distant metastases.  
Results: Median age at diagnosis was 67 and median tumor size was 1.3 cm. Median follow-up was 2.5 yrs. Of the 24 pts, 22 (92%) were node negative (N0), 1 (4.2%) had isolated tumor cells (N0i), and 1 (4.2%) had no axillary evaluation. Twenty-two pts (92%) were estrogen receptor (ER) positive and 2 (8.3%) were ER negative. One pt (4.2%) was HER-2/neu positive. Eighteen pts (75%) received hormonal therapy and three (12.5%) received chemotherapy. Eighteen pts (75%) had negative margins on final pathology. Of 23 pts who received APBI via balloon brachytherapy, 16 (69.6%) were placed in the operating room and 7 (30.4%) were placed in the office. None of the pts developed an infectious complication. One pt (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 this cohort of pts with ILC and treated with BCS 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 Diagnostic Outcomes Obtained Through Surgeon-Performed Ultrasound Screening  
Ian Grady,1 Heidi Gorschut-Rafferty,2 Patricia Hadley1  
1North Valley Breast Clinic, Redding, CA, 2Rockingham Memorial Hospital, Harrisonburg, VA, MD Imaging, Irvine, 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 tomographic, 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 from the tomographic evaluation were confirmed by focused, hand-held ultrasonography 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 tomographic screening study included heterogeneously increased breast density, a personal/biological history of breast cancer, or a calculated lifetime 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-positive rates.  
Results: Two thousand one hundred ninety sonographic tomography studies resulted in a recommended 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 10 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 (5.1%) women with ILC treated with BCS and APBI.  
Conclusions: Our diagnostic yield is in accordance with reported outcomes from hand-held sonographic secondary screening. This represents a significant improvement over mammography alone in high-risk women. The young average patient age at diagnosis and the overall low stage of the cancers diagnosed suggests an improvement in mortality may be possible with tomographic screening. Compared to secondary screening with MRI, tomographic screening can be performed by surgeons experienced in hand-held sonography and involves no administration of contrast or radiation exposure. False-positive findings do occur as a result of tomographic screening. 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.  

1625 Breast Cancer in the Octogenarian  
Cara Guilfoyle, Jack Sario  
Temple University, Philadelphia, PA  
Objective: The percentage of breast cancer patients who are elderly is clearly increasing. There is concern that the older patient—especially the patient over the age of 80—is being underdiagnosed and undertreated. The current analysis was designed to evaluate breast cancer in this elderly population and contrast it to the disease in the younger patient.  
Methods: A retrospective review of all breast cancer patients reported to the American College of Surgeons National Cancer Database from 1998 to 2005. The study cohort included all patients 80 years of age and older. Data collected included: stage at time of diagnosis, histologic type, and initial treatment performed. These data were then compared to those of patients under the age of 80 years.  
Results: The 149,530 cohort patients comprised 10.6% of all breast cancer patients reported during the study period. There was a small but statistically significant difference in stage at the time of presentation: 15.3% of octogenarians presented with advanced disease (stage III or IV) vs 13.8% of younger patients. A slightly lower percentage of older patients presented with infiltrating ductal carcinoma as opposed to the younger population (64.3% vs 68.4%). A significantly greater proportion of younger patients were treated with mastectomy when compared to the octogenarian population (39.6% vs 36.9%). This difference persisted even when data were controlled for stage.  
Conclusions: Octogenarian patients comprise an increasing percentage of all breast cancer diagnois and treated with breast cancer. The octogenarian presents with more advanced disease, suggesting either a more aggressive disease or a greater delay in diagnosis. Also, in all stages, the octogenarian patient is less likely to be treated with breast conservation initially.

1719 Assessing the Ability of a CoC-Accredited Hospital Tumor Registry to Provide Recurrence and Survival Data  
Meghan Hahn, Martin Rosman, Charles Mylander, Jane Ruhle, 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 distant recurrence (DR) data to breast center medical record (Meditech) data and assess the accuracy and completeness of disease status, (2) review CR methods of collecting and recording disease follow-up to evaluate effectiveness and accuracy of these processes, and (3) assess the usability of CR disease follow-up information as a data source for outcomes and quality measures research.  
Methods: Patients selected were diagnosed with stage I-III breast cancer between January 1, 2001, and December 31, 2009, and were diagnosed with stage IV disease before June 1, 2010. Patients meeting criteria were obtained through Meditech search for records having breast procedure codes with corresponding breast cancer ICD-9 codes, and having subsequent inpatient visits with corresponding DR codes. This work resulted in 111 eligible patients. Eligibility and DR diagnoses were confirmed by chart review. Linkage of CR and Meditech DR data was done with matching unique patient Ids. Capture rates and DR codes were compared between both lists.  
Results: CR successfully captured 100% of 111 DR breast cancer stage I-III cases. CR recorded a DR code for 62% of confirmed stage IV patients from Meditech. Of the remaining 38% (42 patients), 20 were ambiguously coded in CR as “never disease free” (code 70). Code 70 is a “placeholder,” and was used in 11% of all breast cancer cases during the study timeframe. CR recorded a site-specific DR code for 43% of cases. For the remaining patients, codes did not provide specific information on recurrence type or location. CR recorded a DR code matching the first DR recorded in Meditech in 37% of cases. DR codes appear in CR with significantly less frequency than they do in Meditech, indicating numerous DRs diagnosed among these patients failed to be recorded. 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 has been in compliance with CoC registry guidelines, the data show that current registry data on disease follow-up do not meet accuracy or completeness requirements necessary to be useful for clinical outcomes and quality improvement research. Modification to these CoC-standard processes would drastically improve registries’ value to current breast cancer programs 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) margins on the final mastectomy specimens. 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 therapy 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 43.5 ± 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 Boolbol
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 bisecing 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 cytookeratin 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.
1705 Presentation of Metachronous Breast Cancer: The Importance of Self and Clinical Breast Exams

Jessica L Keto, Paul L Tartert
St. Luke's-Roosevelt Hospital Center, New York, NY

Objective: Patients treated with breast-conserving surgery remain at risk of developing metachronous cancer in the ipsilateral or contralateral breast. Mammography and clinical exam remain critical in detecting local of these secondary primary cancers. We sought to determine the method of presentation of metachronous breast cancer, comparing this to the presentation of the first primary breast cancer.

Methods: A prospectively maintained database of 2300 breast cancer patients treated with surgery by an individual breast surgeon was reviewed to identify patients who developed metachronous breast cancer. Metachronous breast cancers were contralateral or, if ipsilateral, in a different quadrant than the first cancer, greater than 1 year after diagnosis of the primary tumor, and with pathology inconsistent with a local recurrence. The presentation of the primary 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 metachronous 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 secondary 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></th>
<th>Primary Cancer (% n = 136)</th>
<th>Metachronous Cancer (% n = 136)</th>
</tr>
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<tbody>
<tr>
<td>Presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Califications</td>
<td>30% (41)</td>
<td>25% (34)</td>
</tr>
<tr>
<td>Mammographic density</td>
<td>16% (22)</td>
<td>20% (27)</td>
</tr>
<tr>
<td>Patient self-exam</td>
<td>31% (42)</td>
<td>21% (28)</td>
</tr>
<tr>
<td>Physician exam</td>
<td>22% (30)</td>
<td>29% (40)</td>
</tr>
<tr>
<td>Other</td>
<td>1% (1)</td>
<td>5% (7)</td>
</tr>
<tr>
<td>Mammographically occult</td>
<td>13% (18)</td>
<td>24% (33)</td>
</tr>
</tbody>
</table>

Table 2: Presentation of metachronous cancer

<table>
<thead>
<tr>
<th></th>
<th>Ipsilateral Metachronous (% n = 45)</th>
<th>Contralateral Metachronous (% n = 92)</th>
</tr>
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<tbody>
<tr>
<td>Presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Califications</td>
<td>29% (13)</td>
<td>23% (22)</td>
</tr>
<tr>
<td>Mammographic density</td>
<td>16% (7)</td>
<td>23% (20)</td>
</tr>
<tr>
<td>Patient self-exam</td>
<td>31% (14)</td>
<td>15% (14)</td>
</tr>
<tr>
<td>Physician exam</td>
<td>22% (10)</td>
<td>28% (26)</td>
</tr>
<tr>
<td>Other</td>
<td>2% (1)</td>
<td>11% (10)</td>
</tr>
<tr>
<td>Mammographically occult</td>
<td>31% (14)</td>
<td>21% (19)</td>
</tr>
</tbody>
</table>
Immediate Breast Reconstruction of Segmentectomy Defects Using Extended Autologous Latissimus Dorsi Flap via a Single Incision

Hisham Khalifa, Reham Oreaiba
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 noted 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.

Intraoperative Evaluation of Axillary Sentinel Lymph Nodes Using Touch Imprint Cytology and Rapid Immunohistochemistry

A Khan, M Hameed, 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 immunohistochemistry (IHC) as intraoperative diagnostic tools.

Methods: TIC and ultrarapid IHC (Choi et al. Jpn Clin Oncol 2006) were performed on 62 consecutive cases of fresh axillary sentinel lymph node biopsies and compared with FS. Permanent paraffin sections H&E diagnosis was taken as gold standard. TIC smears were prepared from every corresponding tissue submitted for frozen section. Ultrarapid IHC (CK AE1/AE3) took 25 minutes and was performed at the same time.

Results: Final diagnosis on paraffin section showed 27 cases with axillary metastasis. 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 micrometastases, however, the procedure requires technical expertise.

Table 1

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

Idiopathic Lobular Granulomatous Mastitis: An Institutional Experience

Hadi M Khan1, Corinne Stobaugh-Stevenson2, Nancy Joste2, Therese Bocklage6, John C Russell6

1University of New Mexico School of Medicine - Department of Surgery, Albuquerque, NM
2University of New Mexico School of Medicine - Department of Pathology, Albuquerque, NM

Objective: Idiopathic lobular granulomatous mastitis (ILGM) is a rare inflammatory breast disease that on histopathological examination reveals noncaseating granulomas appearing to originate from breast lobules. The clinical presentation can mimic a breast abscess, cellulitis, or an inflammatory breast cancer. The etiology is unknown, but associations with breast feeding, hormonal contraception, and infections with nonpathogenic bacteria, such as Corynebacteria, have been described. A possible allergic or autoimmune response to breast secretions has also been postulated.

Methods: A retrospective chart analysis was performed of all female patients with benign inflammatory breast disease treated at a single institution from January 2000 to April 2009. Patients with ILGM were compared with non-ILGM patients for age, ethnicity, history of breast feeding, hormonal contraception, surgical interventions (incision and drainage, excision, mastectomy), medical therapy, and observations. Logistic regression model was applied between cases and controls. Institutional IRB approval was obtained for this study.

Results: One hundred twelve total patients were identified, with 18 patients having a pathological diagnosis of ILGM and 94 with other inflammatory breast lesions. ILGM was seen in younger patients as compared to non-ILGM (37.3 vs 45.1 years, p < 0.01). Nine of 18 ILGM patients (50%) were of American Indian ethnicity as compared to the 42 of 94 (44%) controls (p = 0.6). A history of lactation within the past 36 months was seen in 11/18 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.
The Impact of Multifocality/Multicentricity on Surgical Treatment and Breast Reconstruction

Brigid Kellelea,1, Baiba Grube,1, Muhammad Rishi,1 Michelle Sowden,1 Donald Lanni1
1Smilow Breast Center at Yale New Haven Hospital, Yale University, School of Medicine, Department of Surgery, New Haven, CT, 2Yale University School of Medicine, Department of Surgery, New Haven, CT

Objective: The use of adjunct imaging studies often results in discovery of multicentric (MC) and/or multifocal (MF) disease preoperatively. Oftentimes, breast conservation therapy (BCT) can still be safely performed if additional lesions are in close proximity or located within the same quadrant (as deemed comparable). The objectives of this study were to determine rates of mastectomy and partial mastectomy among patients with MC or MF disease, compared to those with unicentric (UC) disease. In addition, we sought to determine whether the presence of MC/MF disease influenced the likelihood of undergoing breast reconstruction.

Methods: A retrospective review of all breast cancer patients treated surgically at our institution from 2002 to 2009 was performed. Patients with biopsy-proven MF/MC disease were identified. Operative, imaging, and pathology reports were reviewed. The type of definitive surgery as well as reconstruction was determined and compared to those with UC disease.

Results: Many patients (40%) with MF disease and even some (16%) with MC disease were able to safely undergo BCT. (Table 1). Among patients who underwent mastectomy, patients who had reconstruction were significantly younger, had smaller tumors, and were more likely to have had an MRI (p < .05 for all comparisons). Among those with MF or MC disease who underwent mastectomy, patients with MC disease were more likely to undergo breast reconstruction vs those with MF disease (66% vs 37%, p < .005). The reasons for this, however, are not completely clear. Patients with MC disease were significantly younger than those with MF disease (57 vs 51 years, p < .05), which may account for some of the difference. However, there was no significant difference with respect to mean tumor size or the use of preoperative MRI between the MF and MC groups.

Conclusions: Tumors that are MF and/or MC are biologically interesting and clinically important and warrant further study.

Type of Surgery by Tumor Pattern

<table>
<thead>
<tr>
<th>Tumor Pattern</th>
<th>Mastectomy Alone</th>
<th>Mastectomy With Reconstruction</th>
<th>Partial Mastectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unicentric</td>
<td>268 (21%)</td>
<td>184 (15%)</td>
<td>793 (64%)</td>
</tr>
<tr>
<td>Multifocal</td>
<td>55 (38%)</td>
<td>32 (22%)</td>
<td>58 (40%)</td>
</tr>
<tr>
<td>Multicentric</td>
<td>14 (29%)</td>
<td>27 (35%)</td>
<td>8 (16%)</td>
</tr>
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337 243 859 1439

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

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

Objective: We conducted a retrospective pathologic evaluation of the sentinel nodes used at many institutions. A recent study published by McLaughlin et al from Memorial Sloan-Kettering Cancer Center in July 2007 concluded that among patients undergoing FSA of the SLN only 7% were excluded patients who underwent SLN prior to neoadjuvant systemic therapy. The following variables were collected from the electronic medical records from 1/1/2007 to 1/1/2010. All patients who underwent SLN were collected on each patient: type of surgery (partial/total mastectomy), histology of tumor, margin status of the lesion, method of diagnosis, presence of preoperative MRI, treatment (surgical or medical oncology). The following variables were collected on each patient: type of surgery (partial/total mastectomy), histology of tumor, margin status of the lesion, method of diagnosis, presence of preoperative MRI, treatment (surgical or medical oncology).

We performed ~800 FSA on SLN. Sensitivity of the FSA was 83% and specificity was 93.6% of the lesion markers were adequately visualized by intraoperative ultrasound (93.6%). Twenty-nine lesions were also preoperatively localized under stereotactic guidance (58%). Twenty-five lesions were also preoperatively localized under intraoperative ultrasound rather than the currently used methods of wire and radioactive seed localization.

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 and TN status. Treatment factors associated with improved OS on UA 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 on MA for IBC patients. Twenty (10.74%) patients had IBC. The majority of IBC patients were Caucasian (68%) with a similar mean age (IBCs were significantly more likely than LABC patients to receive neoadjuvant therapy (90% vs 19%, p < 0.0001) as well as tri-modality treatment, including chemotherapy, radiation, and surgery (89.5% vs 55%, p < 0.0001).

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.

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

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

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

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

Results: Thirty-one lesions in 25 patients had the collagen-based marker placed at time of biopsy. Twenty-two lesions were sonographically-guided needle biopsy. The other nine lesions were either core or stereotactic (93.6%). Seventeen (54.8%) of the lesion markers were adequately visualized by intraoperative ultrasound performed by the surgeon. Intraoperative ultrasound imaging alone was successful for localization in 6 cases (19.4%). Intraoperative difficulties were encountered in 16 of 31 (51.6%) procedures. This included either extrusion of the marker when the biopsy tract was transected in 14 (45.2%) cases or migration of the marker prior to the procedure in 2 (6.4%) cases. The marker was visualized on specimen radiograph in 13 (48.4%) cases. This low rate was attributed to extrusion. The marker itself was retrieved in all procedures. We examined the association between extrusion of the marker and method of localization, length of time between initial localization and excision, size of lesion, and whether a skin ellipse was taken or not. Method of localization, specifically use of a radioactive seed, was the only factor that shown a significant association with marker extrusion. This was felt to be secondary to a high volume of tissue excised, compared to the use of wire and radioactive seed, which was more successfully retrieved. In addition, negative margins were achieved in 100% of the excisions for malignancies.

Conclusions: Use of a localization marker that is placed at the time of initial core biopsy would obviate the expense and inconvenience associated with a separate localization procedure. While intraoperative sono graphic visibility of the collagen-based marker was excellent in our initial experience, a large number of our excisions were associated with extrusion of the marker. Further adjustments are needed in order for this marker to be utilized independently of preoperative wire or seed localization. Recommendations for modifications of the marker itself are a reduction in the collagen component of the marker or a coating that would promote better tissue adherence.

A Comparison of Prognostic Factors in Locally Advanced and Inflammatory Breast Cancer

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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 clinical features and patient outcomes. We hypothesized that IBC would be more likely to have estrogen receptor (ER), progesterone receptor (PR), and HER2 negative cancers compared to LABC and that HER2 positivity would have a worse OS and MFS. IBC patients with HER2 positivity would also have a worse OS compared to non-TN patients for the overall dataset (p < 0.0001). There was a significantly higher proportion of HER2 positive patients in IBC compared to LABC patients. There was no 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 parity 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
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Objective: Population-based studies have revealed decreased mortality and superior outcomes in hospitals that treat higher volumes of breast cancer patients. Studies have also found disparities in breast cancer survival with non-white and lower socioeconomic status (SES) patients having worse outcomes. The purpose of our study was to determine whether non-white or low SES patients are disproportionately treated in low-volume hospitals.
Methods: A population-based cohort of Medicare breast cancer patients who underwent breast cancer surgery in 2003 participated in a survey study examining breast cancer outcomes. Demographic, socioeconomic, and tumor stage information was obtained from survey responses, Medicare claims, and state tumor registry data. Hospital volume was categorized based on tertiles 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 Medicare (p = 0.006), less likely to have other 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.

1762
Variations in Postmastectomy Reconstruction Rates: Invasive and In Situ Carcinoma
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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) (233.8) 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 49 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, 3.56; 95% CI, 2.76-4.42; ORinv, 2.39; 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 hospital reconstruction rates which vary according to diagnosis: 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.

1710
Does Duration to Ipsilateral Breast Tumor Recurrence (IBTR) Affect the Success or Failure of Reoperative Sentinel Lymph Node Biopsy?
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Objective: Five to ten percent of patients with prior breast cancer treated with BCT will develop IBTR, requiring a reoperative SLNB. Several patients will then present with history of prior axillary surgery, which could be an ALND or SLNB. Prior number of LN removed has been reported for success of reoperative SLNB, but duration to IBTR has not been studied.
Methods: We did a 3-year retrospective review of 28 patients and categorized as Prior ALND (>10 lymph nodes, N = 14), 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, of the 28 patients, reoperative SLNB was successful in 7/13 (54%) and 6/10 (60%) patients with duration to IBTR <10 yrs and >10 yrs, respectively (p = 1.0).
Conclusions: Reoperative SLNB is successful in 61% of our patients. Neither duration to IBTR nor prior number of lymph nodes removed influenced the success of the reoperative SLNB in our study. Lack of significance in these findings may be related to small sample size. Large, randomized controlled trials are needed to further assess the success rate of reoperative SLNB.

1733
Sentinel Lymph Node Biopsy in Prophylactic Mastectomy—Are We Overtreating? Experience at a Community Hospital
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Objective: The routine use of sentinel lymph node biopsy (SLNB) at the time of prophylactic mastectomy is controversial. This retrospective study was undertaken to determine the use of SLNB at the time of contralateral prophylactic mastectomy (CPM) at a community hospital.
Methods: Between 2007 and 2009, 170 patients underwent CPM at a suburban, tertiary care facility. The CPM was either immediate, delayed, or for recurrent breast cancer. Thirty-seven (21.8%) patients had SLNB performed at the time of CPM. In 13 cases, the mastectomy 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 nodes or intramammary nodes (non-SLN). The median number of SLN removed was 2 (range, 1-5), none of these were positive. There were three incidental cancers diagnosed on final pathology. Two were invasive and one was DCIS. SLNB was only performed on the patient with DCIS. The invasive cancers were T1a and grade 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.

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**Objective:** 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 presentation, treatment and its outcome of breast cancer patients in Chinese residing in Asia, based on population-based data will be useful to provide a baseline study cohort for comparative studies that of Asian Chinese in the West. This is the first comprehensive population-based breast cancer study performed using the national database of the Hong Kong Cancer Registry.

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

**Results:** A total of 8,156 breast cancer patients’ medical records and dataset were available during this period. Seven thousand six hundred thirty nine (94%) had invasive cancers and 526 (6%) were DCIS. Of the invasive cancers, 48% of our cohort were diagnosed with breast cancer at age 49 years and below. The mean age of diagnosis was 55.3 and median age 52 years old. Eighty-one percent had invasive ductal carcinomas and 3% had invasive lobular cancer. Of those known, 39.20%, 45.3%, and 15.6% had grade I, II, III cancer, respectively; 4.8%, 13%, 54.4, and 26.5% had stage 4, 3, 2, and 1 cancer, respectively; 61% had ER positive cancer; 44% had HER2 positive cancers; 13% of our cohort had triple-negative cancers; 55.8% had chemotherapy, 59% radiation therapy, and 86% of those who had an ER cancer took tamoxifen. The 5-year overall survival, relative survival, and cause-specific survival were 79.6%, 84%, and 85.2%, respectively. Compared with SEER database, the 5-year survival relative survival of 87.1% was similar to our cohort.

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

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Preoperative Localization and Surgical Removal of Rotter’s Lymph Nodes in the Post-Neoadjuvant Breast Cancer Patient

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

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

**Results:** Of 215 patients, 4 had a single abnormal Rotter’s node identified on a pre-chemotherapy MRI and successfully underwent a diagnostic US-guided percutaneous biopsy. Mean Rotter’s node size on MRI was 1.5 cm (range, 1.2-2.3 cm); mean US size was 1.8 cm (range, 1.2-2.4 cm). Mean tumor size on MRI was 6.5 cm (range, 3.8-10.8 cm); three patients (7%) had evidence of pectoralis muscle involvement on MRI. All four patients had a modified radical mastectomy concurrent with wire localization of the interpectoral clip. Three patients had the wire-localized specimen taken separately. All patients had residual disease in both Rotter’s and axillary nodes on surgical pathology. Mean number of Rotter’s nodes removed was 1.5 (range, 1-2); mean node size was 0.8 cm (range, 0.1-1.5). Mean number of axillary nodes removed was 12.8 (range, 7-24); mean number of positive axillary nodes was 3.3 (range, 1-7). All four patients received postmastectomy radiation. There were no surgical complications.

**Conclusions:** Preoperative diagnosis of Rotter’s node involvement is technically feasible and feasible with minimal morbidity. The clinical impact of interpectoral nodal disease merits further study.

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

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**Objective:** Demonstration of spontaneous increased pigmentation in reconstructed nipples derived from native TRAM and latissimus flap tissue has been noted after utilizing areola-sparing mastectomy. This can result in an incredibly natural appearance of the reconstructed nipple and areola and intraareolar tissue necessary. Pathological evaluation of donor skin is minimal, native areola, and reconstructed nipple that had undergone self-darkening was undertaken to attempt to account for the spontaneous color change of the tissue.

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

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

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

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

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

**Methods:** A retrospective review was performed from 2005-2009 with patients categorized according to age distribution recommendations from the USPSTF (<40, 40-49, 50-75, >75 yrs). The presentation characteristics evaluated include mammogram (mammo) detected vs digital (n = 149) mammography were compared. No difference in mean tumor size, tumor markers, and lymph node (LN) status. A similar analysis was performed between patients who presented by SBE/CBE and a mammo <12 months (n = 143) vs >12-24 months (n = 261). Patients with a mammogram <12 months had a higher incidence of Tis tumors (16% vs 9%) and lower incidence of T1 tumors (67% vs 81%), but no difference in T2 or T3 tumor incidence (p = 0.009). Other tumor characteristics were comparable between these two groups, including mean tumor size, tumor markers, and lymph node (LN) status. A similar analysis was performed between patients who presented by SBE/CBE and a mammo <12 months (n = 143) vs >12-24 months (n = 66), which did not reveal any difference in tumor characteristics between the groups. Screened patients were then compared by presentation: mammogram <24 months (n = 379, 64%) vs SBE/CBE and mammography <24 months (n = 320, 36%). Patients who presented by SBE/CBE had larger mean tumor size (2.4 vs 1.3 cm), p < 0.0001; higher T stage, p < 0.0001; higher grade, p = 0.01; more ER- markers (29% vs 16%); more HER2 positive patients (1% vs 0.2%); triple-negative patients (13% vs 4.0%); p < 0.0001; more positive LN (39% vs 17%), p < 0.0001. There was, however, no difference between the groups Her2 status. Lastly, tumor characteristics of patients who had an analog (n = 881) vs digital (n = 149) mammography were compared. No difference in mean tumor size, T stage, or tumor markers was detected.

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

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There was substantial concordance between tumor pathology (type and grade) of the biopsies as shown in Figure 1. There was also good concordance of ER, PR, HER2, and Ki67 expression in surgical resection compared to the surgical biopsy. Some patients had higher Ki67 percentages, some dramatically higher than found in the surgical resection specimen. There was poorer agreement in ER expression where biopsies had higher ER expression than the final surgical specimen (n=30, 66%).

Results: The study included 106 women. Mean 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 mean number of biopsies per patient was 1.36 (range, 1-4). 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.

Table 1: Findings on MRI according to indication for MRI

<table>
<thead>
<tr>
<th>Number (%)</th>
<th>Additional Surgical Findings</th>
<th>Additional Biopsies--Positive</th>
<th>Additional Biopsies--Negative</th>
<th>Additional Change in Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>106</td>
<td>48 (45%)</td>
<td>21 (20%)</td>
<td>26 (24%)</td>
</tr>
<tr>
<td>Age &gt;50 (total N=57) Yes</td>
<td>53 (50%)</td>
<td>21 (39%)</td>
<td>17 (31%)</td>
<td>25 (45%)</td>
</tr>
<tr>
<td>Family history (total N=39) Yes</td>
<td>36 (46%)</td>
<td>18 (50%)</td>
<td>7 (19%)</td>
<td>11 (29%)</td>
</tr>
<tr>
<td>Dense mammogram (total N=10) Yes</td>
<td>50 (58%)</td>
<td>26 (52%)</td>
<td>5 (10%)</td>
<td>14 (27%)</td>
</tr>
<tr>
<td>Breast cancer (total N=19) Yes</td>
<td>13 (68%)</td>
<td>5 (41%)</td>
<td>2 (15%)</td>
<td>5 (26%)</td>
</tr>
<tr>
<td>Lobular cancer (total N=10) Yes</td>
<td>21 (20%)</td>
<td>9 (43%)</td>
<td>3 (15%)</td>
<td>9 (43%)</td>
</tr>
<tr>
<td>DCS (total N=19) Yes</td>
<td>57 (50%)</td>
<td>26 (46%)</td>
<td>5 (10%)</td>
<td>13 (23%)</td>
</tr>
<tr>
<td>DCS enhancement (total N=75) Yes</td>
<td>25 (24%)</td>
<td>12 (48%)</td>
<td>3 (15%)</td>
<td>8 (32%)</td>
</tr>
<tr>
<td>Multifocal disease** (total N=10) Yes</td>
<td>40 (50%)</td>
<td>21 (55%)</td>
<td>3 (50%)</td>
<td>14 (40%)</td>
</tr>
<tr>
<td>Multifocal disease included all cases with multifocal disease diagnosed prior to MRI study.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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.

Conclusions: A decision tree was built to compare two strategies: (A) lumpectomy without frozen section and a second operation for positive margins vs (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, in addition to 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 $4,255 (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 pay for strategy A ranged from $3.104 (15% reoperation rate) to $4.663 (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 resection rates for margin control. Looking at cost to provider, frozen section is cost-effective when the margin re-resection rate is greater than 30% and for Medicare reimbursement, frozen section is cost-effective when margin re-resection rate is greater than 25%.

1698
Factors Associated With Malignancy on Ultrasound-Guided Axillary Core Needle Biopsy

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Objective: 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 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 lymph node biopsy.

Methods: A retrospective review 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, 58 (52.6%) were malignant and 47 (47.4%) were benign. The average patient age was 54.4 (range, 22-89). One-third (33.7%) of patients had a known breast malignancy prior to referral. Axillary biopsy was performed for a palpable mass in 44 (46%) cases, 30 (32%) cases were referred by another provider, and 21 (22%) cases were for examination of a suspicious lesion on mammogram or MRI. Malignant pathology was observed in 42 (44.7%) cases, with malignant and benign core needle biopsy results.

Conclusions: Axillary ultrasound-guided core needle biopsy is a safe and effective technique for evaluating lymph nodes in clinically node-negative patients. Of the clinical and sonographic factors evaluated, none were found to be statistically significant predictors of malignancy. Axillary ultrasound-guided core needle biopsy may be a useful alternative to axillary lymph node biopsy in selected cases.
1654
Outcome in Augmented Patients Who Subsequently Develop Breast Cancer
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Objective: It is commonly thought that augmentation mammoplasty interferes with our ability to diagnose breast cancer and that augmented women therefore have a worse prognosis should they develop breast cancer. We have reviewed our series of patients with breast cancer to determine whether the augmented patients presented with more advanced disease and therefore had a poorer prognosis.

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

Results: Four thousand eight hundred ten nonaugmented women and 195 women who had previously undergone augmentation mammoplasty were treated for breast cancer. Prebiopsy mammography was performed in 121 of 132 augmented patients with palpable lesions. It 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 intervention were concurrently entered in a prospective database.

Results: Three thousand seven hundred thirteen axillary node or sentinel node dissections were performed. Nodal positivity was a poor prognostic sign for all T categories other than Tis. There were positive nodes in 38% of T1a, 55% of T1b, 67% of T2, 84% of T3, and 100% of T4 cancers. Nodes positive by immunohistochimistry only with focci of carcinoma cells equal or less than 0.2 mm or <200 cells (ITCs) were not counted as positive [N0(i+)]. The false-negative mammography rate is higher in augmented women than nonaugmented T1c cancers (p = 0.008). There was a highly significant survival advantage when breast cancers were found in subclinical vs clinical presentations.

1676
Timing of Bilateral Metachronous Breast Cancer
Chantal 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 laterality. The timing of the metachronous disease is also an important factor to determine. There is limited information in the literature regarding the timing of bilateral breast cancer.

Methods: We conducted a chart review of breast cancer patients with bilateral synchronous breast cancer diagnosed between 1979 and 2008. Two hundred十五 total cases of breast cancer were identified. These charts were then reviewed to find those patients who were diagnosed as having metachronous bilateral breast cancer. 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 breast cancer presentation.

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

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

**1640**  
**The Goldilocks Mastectomy: Our Experience in Utilization of Redundant Mastectomy**  
**Flap Tissue Only for Reconstruction in Women With Macromastia**  
Heather Richardson, Grace Ma  
Piedmont Hospital, Atlanta, GA  
**Objective:** To reconstruct a breast mound from cutaneous mastectomy flap tissue alone, obviating the need for additional flap or implant techniques.  
**Methods:** In large-breasted patients who decline traditional methods of breast reconstruction, we have preserved and de-epithelialized residual mastectomy flap tissue for placement under a standard Wise incision pattern. This has allowed the patient to have a complete and oncologically sound mastectomy with preservation of fullness, if not a re-creation of their original breast mound.  
**Results:** Over an 18-month period, five women (seven breasts) with macromastia underwent mastectomy using this technique. All women have been very pleased with the overall cosmetic and have had no long-term complications, local recurrence, or problematic wound healing thus far. Focal areas of fat necrosis have been noted but have not been symptomatic or required any intervention.  
**Conclusions:** We have observed a growing trend of patients with larger, more ptotic breasts. Some of these patients decline traditional methods of breast reconstruction altogether because they do not want additional surgery. Our method of “minimal reconstruction” provides several advantages over simple mastectomy without reconstruction. If the patient still requires prosthesis, the tissue mound helps prevent malposition of the bra. The procedure is performed in a single stage and does not require specialized closure by a reconstructive surgeon, although a team approach can improve overall aesthetics. It is cost effective and does not require implanted devices. Disadvantages include limited range of application as it applies to larger breasts, patients whose upper pole must overlap the inframammary fold. It also creates asymmetry if the contralateral breast is left untouched. We have dubbed it the “Goldilocks” mastectomy because it allows the patient to have a more cosmetically pleasing outcome than simple mastectomy alone without additional effort, time, or cost associated with formal reconstruction.

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**1726**  
**The Relationship Between ABO Blood Type/Ethnicity and Breast Cancer**  
Yara Y 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. Even when poverty, access to healthcare, educational disparity, and socioeconomic status are accounted for, AA women in general have poorer outcomes from 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. 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:** Five hundred forty-one patients were evaluated. Average age was 54(±) years old. The worst prognosis 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 death compared to Caucasians. For stage II it was 1.7 times (see Figure). This difference in survival by race was not seen for type O, B, or AB. In the type A blood group, differences in survival in AA and Caucasians were not related to differences in receptor or Rh status.  
**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.

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**1729**  
**Comparison of Axillary Lymph Node Response After Neoadjuvant Chemotherapy Between Patients With Triple-Negative Breast Cancer and Receptor-Positive Disease**  
Laila Samlian, Ifran 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 strongly chemosensitive and have higher pathologic complete response rate. We questioned whether TNBC patients would be more likely to have eradication of their axillary lymph node metastasis after NAC. Therefore, we compared axillary lymph node response after NAC between patients with TNBC and 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 postchemotherapy axillary lymph node response. Kaplan-Meier survival curves and hazard ratio were calculated to compare the event of death occurred between the two groups.  
**Results:** One hundred sixty-one patients with known tumor profile were treated with NAC. Forty-five patients (28%) had TNBC while 116 (72%) had NTNBC. Patients with TNBC were younger (median age of 48 vs 56) and had worse prognosis (36% decreased 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 downsstaged (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.
1755
Integration of the IBTR! Prediction Tool Into Surgical Decision-Making
Frey Schwabl, Jennifer Chun, Deborah Axelrod, Arielle Cimino, Jessica Billig, Cristina Chekula, 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) for breast-conserving surgery. This tool incorporates information on 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 via the IBTR! tool for the purposes of preoperative discussion. In order to calculate the risk of IBTR using the current benefit of postsurgical radiation therapy, we sought to explore the potential use of this tool in preoperative decision-making.
Results: We had a total of 142 patients with a median age of 61 (range, 28-89 years). Regarding the variables contained in the IBTR! risk model, all patients had negative margins, 123 (87%) had no lymphovascular invasion, 73 (53%) had a tumor size ≤ 1 cm, and the majority (63%) had grade 2 tumors. The average predicted IBTR in our cohort was 5.7% (range, 1.5-26.7%). A minority of our patients (170 years) had an IBTR risk <3%. There was a statistically significant difference in the IBTR! risk scores for the different age groups (p < 0.001).
Conclusions: As patients consider their surgical options prior to definitive breast cancer surgery, the risk of IBTR is an important element in the discussion. In our study, the risk of IBTR predicted by the model is significantly less than the generally quoted risk. In the oldest age group, the low IBTR risk may suggest that these women may not benefit from radiation therapy. In the youngest age group, the predicted IBTR risk should be part of the discussion regarding surgical options. Although the IBTR! Model is difficult to utilize in a preoperative manner, it may yield an appropriate risk for decision-making certain standards approaches to systemic treatment. This information may aid patients and physicians in making decisions regarding breast-conserving surgery using a more individualized approach to the risk of IBTR.

1746
Expression of ALDH1 As a Marker of Mammary Stem Cells in Benign and Malignant Breast Cancer
Theresa Schwartz1, Stephanie Kingman1, Iman Martin1, Celina Kleer2, Lisa Wicha2, Lisa Newman1
1University of Michigan, Ann Arbor, MI, University of Illinois, Chicago, IL
Objective: Premenopausal breast cancer and tumors that are negative for the estrogen receptor, the progesterone receptor, and HER2 are frequently referred to as “triple-negative” (TN) breast cancer. This tumor subset is associated with a worse clinical outcome than other subtypes. We have recently shown that ALDH1 levels correlate with TN breast cancer prognosis. Here we aim to investigate whether ALDH1 expression is associated with basal breast cancer tumor subtypes.
Methods: We analyzed benign and malignant breast specimens from Ghanaian women through an 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 sequenced the expression 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 2008.
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, 35 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 malignant mammary cells (as detected by ALDH1 expression) are more commonly present in the breast tissue of women from Ghana. These findings may be a factor in the known increased frequency of early-onset and triple-negative breast cancer of Ghanaian women. Further studies are necessary to confirm our findings and to fully understand their clinical significance regarding the biology of breast cancer in international populations. This work also demonstrates the value of international breast oncology collaborative efforts.

1737
Assessment of the Memorial Sloan-Kettering Cancer Center Nomogram for the Prediction of Positive Sentinel Lymph Nodes in Men with Breast Cancer
Jeffrey S Scow, Sejal S. Shah, Carol Reynolds, Amy C Degnim, James W Jakub, Judy C Boughey Mayo Clinic, Rochester, MN
Objective: The Memorial 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 general public as an online tool and may incorporate an important knowledge of men’s 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.
Methods: With institutional review board approval all men treated for invasive breast cancer at Mayo Clinic, Rochester, MN, from 2000-2010 were identified. Medical records and specimen slides were examined to determine patient age, tumor size, type, grade, and location; presence of lymphovascular invasion (LVI) and multifocality, estrogen receptor (ER) and progesterone receptor (PR) status, and presence/absence of SLN metastasis. SLN metastasis was defined as in the MSKCC nomogram and included metastasis seen on hematoxylin and eosin staining and those seen by immunohistochemistry. A receiver operating characteristic (ROC) curve was constructed and the area under the curve was calculated based on the presence/absence of SLN metastasis and probability of SLN metastasis as predicted by the MSKCC nomogram.
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 metastases 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 did not have 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.

1700
Randomized Controlled Trial to Reduce Bacterial Colonization of Surgical Drains After Breast and Axillary Operations
JSC Scow, TL HSokin, JC Boughey, JW Jakub, JM Miller, MP Liprinoz, RP Patel, LM Baddour, AC Dagnim Mayo Clinic, Rochester, MN
Objective: Surgical site infections (SSI) occur more frequently after breast and axillary operations than other clean surgical procedures. Surgical drains have been implicated in SSI and are a potential source of bacterial entry into the wound environment. The aim of this study was to determine if bacterial colonization of drains could be reduced by simple and inexpensive local antiseptic interventions.
Methods: With institutional review board approval and patient consent, patients undergoing total mastectomy (TM) without reconstruction and/or axillary lymph node dissection (ALND) were randomized to standard drain care (control) or drain antisepsis (treated). Sturgeon were blinded to an individual’s assignment. Drain interventions were instituted and patients were instructed how to care for drains on postoperative day (POD) 1 by nurse study coordinators. Control patients cleaned the drain site twice daily with alcohol swabs. Treated patients performed antiseptic procedures until drain removal and included both (1) a chlorhexidine impregnated gauze (BIOPATCHs, Johnson & Johnson Medical) placed at the drain exit site and changed every 3 days, and (2) drain bulb irrigation with dilute sodium hypochlorite solution (Dakin’s solution 0.025%) twice daily. Semiquantitative aerobic and anaerobic cultures of drainage fluid were obtained steriley for all patients at POD 6-8 and at time of drain removal if <POD 6-8. In most patients, a 5-cm portion of intracorporeal drain, 1 cm proximal to the exit site, was cultured at drain removal. Rates of SSI were calculated at drain removal. Rates of drain fluid and tubing colonization (<1 growth and <50 CFU, respectively) between the control and treated groups were compared.
Results: Overall, 87 patients were enrolled and 76 patients with 96 drains completed the study: 40 patients (52 drains) were randomized to drain antisepsis and 36 patients (44 drains) to the control group. Antibiotics were administered to all patients prior to incision and discontinued within 24 hours. 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 use 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 drains and 23% of treated drains (12/52, p < 0.001). Drain tubing was cultured at time of drain removal from 52 patients (67 drains - 29 control and 33 antiseptic) and was positive in 21% (6/29) of control drains and 0% (0/38) of treated drains (p = 0.005). Among drains with positive bulb fluid cultures at the time of drain removal, the drain tubing also cultured positive in 32% (6/19) of control drains and 23% of treated drains (12/52, p < 0.0001). Drain tubing was cultured at time of drain removal if >POD 6-8. In most patients, a 5-cm portion of intracorporeal drain, 1 cm proximal to the exit site, was cultured at drain removal. Rates of drain fluid and tubing colonization (<1 growth and <50 CFU, respectively) between the control and treated groups were compared.
Conclusions: Simple and inexpensive local antiseptic interventions with a chlorhexidine disk and hypochlorite solution reduce bacterial colonization of surgical drains. Based on these data, further study of drain antisepsis and its impact on SSI rate is warranted.
1717

1738

Risk Class
<10 12(2.08) 2 of 12(2.08)
10-20 13(19.62) 2 of 12(2.08)
>20 17 of 31(54.80)

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

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 AACR Breast Center, ANNAPOLIS, MD

Objective: Positive margins following BCS are a significant problem, frequently leading to further therapy, mastectomy, or standard of care (SOC). In the device arm, the probe was used to map 5-8 points per margin, covering the specimen in 3-5 minutes. A positive reading required immediate shaving of additional tissue from the breast covering to that margin (device was not used on cavitary or excised specimens). Following device use (or SOC), specimens were inked, sent for intraoperative pathology. The primary endpoint was complete surgical resection (CSR), the rate of which could be excised (accounting for deep margins to fascia or anterior margins to skin for which no further excision was needed). 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 testing cases. Analyses were performed on randomized patients. As expected, the rate of main specimens with positive margins was similar in each group (54.7% vs 55.3%, P = 0.82). When using a novel device to assess margins intraoperatively on lumpectomy specimens of patients undergoing BCS, successfully achieved a lower positive margin rate and reduced number of re-lumpectomy.

In conclusion, use of a device led to minimal additional breast tissue removed.

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 their co-morbidities. Methods: IRRB 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 women aged 70 and above who were ER+ and HER2 negative underwent surgery as their initial treatment. Most women presented with image-directed cancers (67%) or invasive ductal carcinoma (70%) compared to invasive lobular carcinoma (8%) and other ductal subtypes (22%). Mean tumor size was 1.1 cm. Angiolympathic invasion was present in 6% (15 patients) and 13% (30) had multiple ipsilateral cancers. Positive lymph node involvement was found in 31 (14%) women. One hundred eighty-nine (84%) women underwent breast-conserving therapy, 33 (15%) mastectomy and 4 (2%) mastectomy with reconstruction. A total of 64% underwent radiation therapy after BCT. Adjunct endocrine therapy was given to the majority of patients (70%), whereas only 3% received chemotherapy. Co-morbidities included hypertension, 56%; coronary artery disease, 14%; hyperlipidemia, 37%; COPD, 5%; renal insufficiency, 5%; and diabetes, 10%. Average BMI among patients was 27, 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, 30% (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 medicantly compliant elderly population, we confirm that women who are diagnosed with T1 ER+ breast cancer have this 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. Further study can be taken into consideration by physicians and patients alike when they are making their treatment choices.

<table>
<thead>
<tr>
<th>USC/VNP Score</th>
<th>No. of Pts</th>
<th>12-Year Recurrence %</th>
<th>Treatment Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>All 4, 5 or 6</td>
<td>380</td>
<td>Excision alone ≤ 6%</td>
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<tr>
<td>7, Margins ≥ 3 mm</td>
<td>170</td>
<td>Excision alone     16%</td>
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<td>7, Margins &lt; 3 mm</td>
<td>115</td>
<td>Excision + radiation 14%</td>
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<tr>
<td>8, Margins ≥ 3 mm</td>
<td>111</td>
<td>Excision alone     15%</td>
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<td>8, Margins &lt; 3 mm</td>
<td>172</td>
<td>Mastectomy alone    7%</td>
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<td>9, Margins &lt; 5 mm</td>
<td>188</td>
<td>Mastectomy alone   0%</td>
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<tr>
<td>10</td>
<td>196</td>
<td>Mastectomy alone   7%</td>
<td></td>
</tr>
<tr>
<td>All 11 or 12</td>
<td>161</td>
<td>Mastectomy   10%</td>
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</table>

1750

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 Silverstein 1, Michael D Lagios 2, James R Waisman 3, Lisa Guerra 4

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1 University of Southern California, Los Angeles, CA, 2Breast Cancer Consultation Service, 3BreastLink Medical Group, Long Beach, CA, 4Hoag Memorial Hospital, Newport Beach, CA

Objective: The USC/VNP is an algorithm, based on a rigid pathology protocol, which permits risk stratification and is capable of measurable prognostic impact. It is important in predicting local recurrence in patients with DCIS. These include tumor size, margin width, nuclear grade, age, and comedonecrosis. When originally published (Cancer 1996;77:2267-74), the Index was based on patients and treatment modalities that may not be comparable to present standards. The objective of this study was to evaluate the accuracy of the USC/VNP score, which uses dielectric spectroscopy to capture the properties of the target tissue, compare them to predefined criteria, and classify them as normal or malignant.

Methods: A total of 63 patients with pure DCIS, with 84 months of follow-up were analyzed.

Results: A total of 63 patients with pure DCIS, with 84 months of follow-up were analyzed.

Conclusions: These include tumor size, margin width, nuclear grade, age, and comedonecrosis. The value of the USC/VNP has been used as a tool to help manage the disease, to be more finetuned 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 patients who score 8 or less and have margins <3 mm, for patients who score 8 and have margins ≥3 mm, for patients who score 9 and have margins ≤5 mm, mastectomy is appropriate for patients who score 9 and have margins <3 mm, who score 9 and have margins ≥5 mm. Mastectomy is appropriate for patients who score 9 and have margins <3 mm, who score 9 and have margins ≥5 mm, for patients who score 9, 10, or 12, regardless of margin width.

Conclusions: These include tumor size, margin width, nuclear grade, age, and comedonecrosis. These include tumor size, margin width, nuclear grade, age, and comedonecrosis. These include tumor size, margin width, nuclear grade, age, and comedonecrosis. These include tumor size, margin width, nuclear grade, age, and comedonecrosis. To achieve a local recurrence probability of less than 20% at 12 years, these data support excision alone for all patients who score 8 or less and have margins <3 mm, for patients who score 8 and have margins ≥3 mm, for patients who score 9 and have margins ≤5 mm, mastectomy is appropriate for patients who score 9 and have margins <3 mm, who score 9 and have margins ≥5 mm, for patients who score 9, 10, or 12, regardless of margin width.

Conclusions: These include tumor size, margin width, nuclear grade, age, and comedonecrosis. These include tumor size, margin width, nuclear grade, age, and comedonecrosis. These include tumor size, margin width, nuclear grade, age, and comedonecrosis. These include tumor size, margin width, nuclear grade, age, and comedonecrosis. This study, using a novel device to assess margins intraoperatively on lumpectomy specimens of patients undergoing BCS, successfully achieved a lower positive margin rate and reduced number of re-lumpectomy.

In conclusion, use of a device led to minimal additional breast tissue removed.
Malignant Phyllodes Tumors of the Breast and Impact of Race: 25-Year Experience in an Integrated Community Hospital System

John J. Ayala, Wendy L. Sisson, Christopher V. Nguyen, Lisa Robinson, James Marx, Jeffrey Stephenson

Objective: Many have studied the impact of race on outcomes 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 tumors 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 no 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 borderline 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 borderline, 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 = 0.02). 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 surgery (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 distant metastases to both lungs, bone, liver, and heart. The remaining patient 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 patients with recurrences diagnosed 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.

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1663 Complications of Immediate Breast Reconstruction Do Not Cause Treatment Delays
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Objective: Immediate breast reconstruction following breast cancer surgery may not be offered to patients due to concerns regarding potential adjuvant treatment delays resulting from surgical complications. We sought to determine delays in time to adjuvant radiation and systemic therapy associated with surgical complications for patients undergoing concurrent breast oncologic and reconstructive procedures.

Methods: A retrospective review was performed of sequential patients undergoing combined oncoplastic and 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 22.4%; stage III, in 20.7%; and stage IIIC 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 adjuvant systemic or radiation therapy. Although further improvement in overall complication rates and time to adjuvant therapy is warranted, women undergoing breast cancer surgery can safely be offered immediate reconstruction of partial or total mastectomy defects.

1673 Factors Predicting the Non-Sentinel Lymph Node Metastasis in Breast Cancer Patients With Sentinel Lymph Node
Micrometastasis
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Objective: To identify the 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 which axillary dissection may be omitted.

Methods: Data was reviewed for 353 patients diagnosed with clinical operable T1-3 N0 invasive 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 immunostaining 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 found to have macrometastases (> 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 the only 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 those with T2-3 tumors (T1, 4.8% vs T2-3, 29.4%; OR = 1.8; 95% CI, 0.88-3.84).

Conclusions: Our data confirm an approximate 50% reduction in local recurrence if radiation therapy is given and are consistent with the published prospective randomized data, but the pattern of recurrence in irradiated patients differs significantly from excision-only patients. Twenty-six percent of postirradiation recurrences were in different quadrants, in essence, new cancers, compared with only 9% for excision-only patients. Irradiated patients who recurred took much longer to recur. This was true for both invasive and DCIS recurrences. When irradiated patients recurred, they had a higher percentage of invasive recurrences. This resulted in a statistically significant lower 10-yr breast cancer specific survival.
Predicting Breast Cancer Outcome and Nodal Metastasis by Routine Histopathology Compared to Hormonal Receptor Status and HER2 Overexpression

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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.

Table:

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

The Effect of Preoperative Breast MRI Use on Mastectomy Rate

Jennifer Williams, Mary Politi

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Objective: MRI in the preoperative management of breast cancer has increased dramatically. Coincidently, 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 (3/2007-5/2008). 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 outcomes. Most other studies have been single institutional studies looking at 40 or fewer cases.

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, AKC staging, and family history for the three time periods. MR use significantly increased from 20% in the pre-MR group to 70% in the post-MR group (p < 0.05). There was no statistically significant change in the initial use of unilateral mastectomy and mastectomy because of positive tumor margins (pre-MR, 18%, 4%; post-MR, 20%, 2%). There was a dramatic increase in use of bilateral mastectomy in the initial treatment of breast cancer with 5% (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.

Encysted and Solid Papillary Carcinomas of the Breast

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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 among expert pathologists as to the exact nomenclatures of these lesions, as well as regards presence and size of invasion. This would obviously create treatment dilemmas for adjuvant treatment. There is only one meta-analysis of 907 cases recently published concluding that patients with encysted PC have a favorable outcomes. Most other studies have been single institutional studies looking at 40 or fewer cases. The aim of this study was to review current management and treatment outcomes in patients with papillary carcinomas diagnosed and treated at a single large community hospital.

Methods: This is 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 have, 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 ductal carcinoma (PC-IC). We did this 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 ductal carcinoma (PC-IC). We did this 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 ductal carcinoma (PC-IC). We did this 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 ductal carcinoma (PC-IC). We did this 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 ductal carcinoma (PC-IC).

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 detectable on 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: 3D-MRI and 3D-CT Mammary Lymphography Can Predict the Sentinel Node Metastasis

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Objective: 3D-CT lymphography (LG) can show the detailed lymphatic network of the breast and the axilla, and can contribute to more accurate sentinel node (SN) biopsy. We reported the effectiveness of SPECT-fused 3D-CT LG for surgery at the last meeting. Now, we applied 3-tesra-MRI for the same purpose.

Methods: We performed 3D-CT LG on 180 patients and evaluated SN in 3D-MRI on 50 patients. In the axilla, we could evaluate SN in 30 patients. We could not evaluate SN in 20 patients. We could evaluate SN with 3D-MRI guided with 3D-CT LG in 43 patients. The sensitivity of SPECT-fused 3D-CT LG was 94%, and the sensitivity of 3D-MRI was 87%. We concluded that SPECT-fused 3D-CT LG is an effective indication tools to decide the axillary surgery: SN biopsy or axillary preservation. Enhancer pattern of SN with 3D-MRI with 3D-CT LG. They will help the accurate SN biopsy and will be the indication tools to decide the axillary surgery: SN biopsy or axillary preservation.

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 sampled number of SN was 2.3. SN metastasis was observed on 16 patients and not on 34 patients. Only sentinel node metastasis was on 10 patients (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 incompatible 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 18, and nonenanced pattern was on 6. 3D-MRI was more sensitive to metastasis than only 3D-CT LG. The precociously 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
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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 widened by applying 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.