THE AMERICAN SOCIETY OF BREAST SURGEONS

9TH ANNUAL MEETING

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NEW YORK CITY

Jointly sponsored by the American College of Surgeons and The American Society of Breast Surgeons

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THE AMERICAN SOCIETY OF BREAST SURGEONS

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Scientific Session

ABSTRACTS

OFFICIAL PROCEEDINGS

Volume IX
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 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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**Predictors and Outcomes of Contralateral Prophylactic Mastectomy**  
I. ORAL PRESENTATION

ABSTRACTS
Note: Underscore indicates presenting author.
A Prospective, Randomized, Controlled, Multicenter Study of a Real-Time, Intraoperative Probe for Positive Margin Detection in Breast-Conserving Surgery for Breast Cancer

Tanir Allweis1, Zvi Kaufman2, Shlomo Lelcuk3, Itzhak Pappo4, Tami Karni4, Shlomo Schneebaum5, Rona Spector3, Asher Schindel1, Dan Hershko6, Moshe Zilberman7, Joel Sayfan8, Yuri Berlin8, Amram Hadary9, Oded Olsha10, Mordechai Gutman2, Moshe Carmon10

1Hadassah Hebrew University Medical Center, Jerusalem, Israel, 2Meir General Hospital, Kfar Saba, Israel, 3Rabin Medical Center, Belinson Campus, Petah-Tikva, Israel, 4Assaf-Harofeh Medical Center, Zrifin Beer-Yakov, Israel, 5Tel Aviv Sourasky Medical Center, Tel-Aviv, Israel, 6Rambam Medical Center, Haifa, Israel, 7The Baruch Padeh Medical Center, Poriya, Israel, 8Haemek Medical Center, Afula, Israel, 9Sieff Government Hospital, Safed, Israel, 10Shaare Zedek Medical Center, Jerusalem, Israel

Objectives: An ongoing study was designed to examine the clinical utility of a real-time device for margin assessment during breast-conserving surgery (BCS). Intraoperative positive margin detection and repeat surgery rates were compared in patients undergoing lumpectomy with or without the device.

Methods: The MarginProbe (Dune Medical Devices) is a surgical system for real-time breast specimen margin assessment used by the surgeon. It provides binary output per specimen margin. Breast cancer patients undergoing BCS were enrolled in a randomized, double-arm study incorporating 11 sites and 35 surgeons. In the device group, the surgeon applied the probe to the excised lumpectomy specimen, sampling 5-12 points per margin and shaving additional tissue according to device readings. Margins suspected as being positive by clinical, radiological, or frozen section assessments were also re-shaved. Microscopic margins ≤1mm were defined as requiring removal of additional tissue. Data were analyzed for the entire patient cohort and for a subset of patients with nonpalpable lesions (NPL). Patients were followed for cosmetic outcome up to 6 months postop.

Results: Two hundred nine breast cancer patients were enrolled and randomized in the study, including 113 (54%) with NPL. Repeat lumpectomy rate was lower in the device arm, 8% versus 15% (P = 0.13). In the NPL subset repeat surgery (including mastectomy), rates were 12% versus 30% (P = 0.025) for device and control arms, respectively, a 59% reduction in reoperations. In this subset, repeat lumpectomy rates (excluding mastectomy) were 9% versus 21% (P = 0.07). Intraoperative identification of all positive margins was superior in the device arm, both in the entire patient cohort (65% vs 40%, P = 0.015) and in the NPL subset (86% vs 29%, P = 0.0001). The superior margin identification in the device arm was associated with improved correct surgical reaction, defined as additional shaving in all histologically detected positive margins. There were no differences in excised tissue volume or cosmetic outcome between the 2 study arms.

Conclusions: Intraoperative use of the MarginProbe for positive margin detection is safe and effective in breast conservation surgery. The device contributes to guided intraoperative shaving of additional tissue and thus to a decreased rate of repeat surgical procedures.
**Molecular Breast Imaging: Experience With the First 900 Patients**

**Judy Boughey, Deborah Rhodes, Stephen Phillips, Carrie Hruska, Amy Degnim, Michael O'Connor**

**Mayo Clinic, Rochester, MN, United States**

**Introduction:** Molecular breast imaging (MBI) is a new nuclear medicine technique, which images the functional uptake of targeted radiotracers in the breast using dedicated gamma cameras. Studies at our institution are evaluating the role of MBI. More than 900 patients have been studied, including 250 patients with suspicious (BI-RADS 4-5) lesions on ultrasound or mammogram and 650 asymptomatic patients who were at high risk for breast cancer, had dense breast parenchyma, and were presenting for regular screening mammography.

**Methods:** The MBI procedure involves administering 20 mCi of Tc-99m sestamibi via intravenous injection. The breast is then positioned on the dedicated MBI system in a manner similar to mammography with light pain-free compression of the breast. The original MBI gamma camera design was a single 20 x 20-cm detector made of the semiconductor cadmium zinc telluride (CZT). A dual-head MBI system comprising 2 such detectors that acquire opposing views of the breast has recently been developed at our institution. MBI findings were compared with pathology results as the gold standard.

**Results:** Among 67 breast cancers imaged on the single-head system, sensitivity for breast cancer detection was 85% (57/67) overall and 29% (2/7), 86% (24/28), and 97% (31/32) for tumors <6, 6-10, and >10 mm in diameter, respectively. Among the 120 breast cancers imaged with the dual-head system, sensitivity improved to 92% (110/120) overall and 76% (16/21), 90% (37/41), and 98% (57/58) for tumors <6, 6-10, and >10 mm, respectively. In the 650 screening patients, 7 cancers were detected with MBI, 5 which were not detected with mammography. In this group, only 1 cancer was detected by mammography but not by MBI, a <5-mm area of DCIS. Overall 187 cancers were imaged in 146 patients. In 21 (14%) of 146 breast cancer patients, MBI detected additional disease not seen on mammography. Sensitivity with dual-head MBI was 88% (45/51) for invasive ductal (IDC), 90% (19/21) for invasive lobular (ILC), 100% (13/13) for ductal carcinoma in situ (DCIS), 100% (27/27) for IDC with DCIS, and 75% (6/8) for other invasive cancers.

**Conclusion:** Molecular breast imaging can detect IDC, DCIS, and ILC. Additionally it has a promising role in evaluating extent of disease and multifocal disease in the breast for surgical treatment planning.
The Survival Impact of the Choice of Surgical Procedure After Ipsilateral Breast Cancer Recurrence

Steven Chen, Steven Martinez

*University of California: Davis, Sacramento, CA, United States*

**Introduction:** As more women choose lumpectomy followed by radiation therapy, the choice of surgical treatment of recurrent breast cancer has become a more common issue. Many women undergoing prior breast conservation desire repeat lumpectomies. We hypothesized that women undergoing mastectomy for breast cancer recurrence would demonstrate superior survival.

**Methods:** Patients undergoing surgery for ipsilateral breast cancer recurrence diagnosed between 1998 and 2004 were identified using the Surveillance, Epidemiology, and End Results Database. We included only patients who had undergone lumpectomy followed by radiation for treatment of their initial breast cancer. We studied the choice of procedure for their recurrent breast cancer. Data was also collected on patient demographics, tumor characteristics, and choice of procedure, and radiation therapy. Exclusions were made for patients that had a prior malignancy other than breast cancer and for incomplete data on tumor size or operation type. Univariate survival analysis for different treatment groups was done using the Kaplan-Meier method. Cox regression was used for multivariate analysis. Significance was determined by the log rank test.

**Results:** Criteria for analysis were met in 811 patients. Of those, 179 patient (22%) underwent a lumpectomy. Sixty-seven (8.3%) received further additional radiation. On univariate analysis, patients undergoing lumpectomy had worse overall survival compared to those receiving mastectomy ($P = 0.03$). Five-year survival was 67% for the lumpectomy group versus 78% for the mastectomy group. On multivariate analysis, choice of mastectomy remained significantly associated with a better survival with a hazard ratio of 0.58 ($P = 0.015$). Other significant factors that improved prognosis included lower T stage, lower M stage, lower grade, lower age, ER-positive status, and longer disease-free intervals.

**Conclusions:** The use of lumpectomy for breast cancer recurrence in a breast previously treated with lumpectomy and radiation therapy should be generally discouraged.
Improved Breast Cancer Survival of HRT Patients, Regardless of Regimen or Length of Therapy, Is Durable After an Additional 5 Years of Follow-up

Dara Christante, SuEllen Pommier, Jennifer Garreau, Patrick Muller, Brett LaFleur, Rodney Pommier

Oregon Health & Science University, Portland, OR, United States

Introduction: We previously reported that tumors in patients with a history of hormone replacement therapy (HRT) were significantly smaller, lower grade, and more often node-negative than in never-users. At 2.5 years’ mean follow-up, HRT users had significantly better survival. Because of controversies about HRT and breast cancer, we updated this series with longer follow-up and included new data regarding hormone regimens and duration of use. Complementary basic science experiments investigated the effects of estrogen (E) and medroxyprogesterone acetate (MPA) on breast cancer cells in vitro.

Methods: Our database of 292 postmenopausal breast cancer patients (144 HRT users) was updated to include type and duration of HRT and current disease status. Disease-specific Kaplan-Meier survival rates were recalculated and compared by log-rank analyses. For in vitro studies, ER+/PR+ and ER-/PR- breast cancer cell lines were treated with E (1-10nM) and/or MPA (0.1-250nM) for 5 days. Cell proliferation was measured by MTT assay.

Results: After an additional 5 years of follow-up, HRT users had a survival rate of 93.8% compared with 87.2% for never-users ($P = 0.02$). HRT for >5 years was associated with a significantly higher probability of tumor detection by mammography ($P = 0.02$) despite no difference in frequency of screening mammography between HRT users and never-users. Among patients with mammographically detected tumors, HRT users had 100% survival compared with 93.7% for never-users ($P = 0.02$). Furthermore, patients with >9 years of HRT also had 100% survival regardless of mode of tumor detection. There were no significant differences in survival between users of E plus MPA and users of E alone. Similarly, no significant proliferation was observed in either cell line following treatment with any concentration of E plus MPA. Exposure of ER+/PR+ cells to E supported minimal proliferation at the low concentration. A higher concentration of E was growth inhibitory.

Conclusions: Survival rates for HRT users continue to be significantly better. Long-term use was associated with more mammographically detected tumors and a 100% survival rate. No differences in survival were seen between HRT regimens. In vitro results support our clinical findings that the use of E or E plus MPA does not worsen outcomes.
The Combination of Axillary Ultrasound and Ultrasound-Guided Biopsy Is an Accurate Predictor of Axillary Stage in Clinically Node-Negative Breast Cancer Patients

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Introduction: Axillary lymph node status remains the most important prognostic factor in patients with breast cancer. Sentinel lymph node biopsy (SLNB) has emerged as the procedure of choice for staging the axilla and in identifying patients who may benefit from axillary lymph node dissection (ALND). The aim of this study was to review our experience with axillary ultrasound (U/S) and fine needle aspiration biopsy (FNAB) to determine the feasibility and accuracy of this less invasive technique for staging the axilla.

Methods: We retrospectively reviewed the charts of 256 consecutive patients with clinically node-negative breast cancer who underwent axillary U/S at our institution over the past 2 years. Only those patients with “suspicious” axillary lymph nodes, as determined by standard imaging criteria (size, shape, effacement of the hilum), underwent FNAB. Data included patient demographics, tumor size, U/S interpretation, FNAB cytology, and final pathologic stage of the axilla. U/S-guided FNAB results were compared to standard histopathology to determine the overall sensitivity, specificity, negative predictive value (NPV), and positive predictive value (PPV) of this method.

Results: U/S-guided FNAB and final lymph node pathology were both positive in 92 of 256 patients (36%). In 152 of 256 cases (59%), both the U/S (or U/S-guided FNAB) and final lymph node pathology were negative. Two of 256 patients had a false-positive FNAB (1%); both had received neoadjuvant chemotherapy prior to completion ALND. Nine patients (4%) had a false-negative FNAB; the median size of the lymph node metastasis was 3 mm (range, 1.5 mm-2.2 cm). The sensitivity and specificity of U/S alone was 78% and 81%, and of FNAB alone was 89% and 93%. The overall sensitivity and specificity of U/S-guided FNAB was 69% and 99%, with an NPV of 91% and a PPV of 95%.

Discussion: The combined use of U/S and U/S-guided FNAB is accurate in predicting the true status of the axilla in nearly 70% of patients with clinically node-negative breast cancer. It has the advantage of being minimally invasive with an exceedingly low complication rate and can obviate the need for staged SLNB/ALND procedures. Factors that may contribute to discordance between FNAB and final histopathology include preoperative neoadjuvant chemotherapy and sampling error.
Noncompliance With Adjuvant Radiation, Chemotherapy or Hormonal Therapy in Breast Cancer Patients

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Introduction: The outcome of breast cancer treatment is dependent upon adherence to the National Comprehensive Cancer Network guidelines. There is little information on patient-driven noncompliance of adjuvant therapy and its consequences.

Methods: A prospectively kept database was used to identify breast cancer patients who were recommended adjuvant radiation after breast conservation surgery, chemotherapy, or hormonal therapy with tamoxifen. The age, race, tumor size, pathology, differentiation, nodal involvement, and outcome of patients who complied with recommended adjuvant therapy were compared to those who refused (noncompliant).

Results: Chemotherapy refusal was observed in 31 (7%) of 421 patients who were recommended. Compared to chemotherapy-compliant patients, noncompliant patients were significantly older (57 vs 52, \( P = 0.011 \)), and less likely to receive radiation therapy (43% vs 69%, \( P = 0.007 \)). Five-year local and distant disease-free survival rates were not significantly affected by chemotherapy noncompliance. Radiation therapy refusal was observed in 30 (3%) of 883 patients who had potentially curative lumpectomy. After 10 years, noncompliance to radiation is associated with higher rate of local and distant recurrence compared to irradiated patients (13% vs 6%, 30% vs 7%). However, 10-year overall survival rate was not affected by compliance to radiation. Noncompliance with tamoxifen was observed in 294 (37%) of 788 patients who were recommended. These patients were younger (54 vs 59, \( P < 0.001 \)), with larger tumors (24 mm vs 18 mm, \( P = 0.007 \)), more often had ductal histology (89% vs. 84%, \( P = 0.039 \)), and were more often treated with mastectomy (38% vs 21%, \( P < 0.001 \)). Five-year local and distant disease-free survivals were lower for noncompliant patients compared to compliant patients (87% vs 96%, 76% vs 87%, respectively, \( P < 0.001 \)).

Conclusion: Noncompliance with tamoxifen is common, resulting in significantly increased risk of local and distant disease recurrence. Radiation therapy noncompliance is infrequent and associated with significantly higher risk of local recurrence. Chemotherapy noncompliance is infrequent and did not adversely affect the local or distant disease-free outcome.
Internal Mammary Sentinel Node Biopsy in Breast Cancer

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Objective: To determine the value of lymphoscintigraphy (LS) for IMSN identification, the rate of positivity and the change in staging and treatment.

Methods: Between 2001 and 2007 a prospective database was obtained of all patients undergoing IMSN biopsies for parasternal uptake on LS or guided by gamma probe. An IMSN biopsy was also performed for a subgroup of medially and centrally located tumors under protocol. The radiotracer injection was peritumoral. Blue dye was used when available or per surgeon’s choice. An open or thoracoscopic approach was used for the IMSN biopsy.

Results: Thirty-four patients (age, 32-67) were included, 33 females and 1 male. There were 15 (44%) central, 10 (29.4%) medial, and 9 (26.5%) lateral tumors. The histology was invasive ductal in 29 patients (85.3%), invasive lobular in 2 (5.9%), and 3 (8.9%) were DCIS. Of the 31 invasive tumors, there were 24 (77.4%) T1 lesions, 6 (19.4%) T2 lesions, and only 1 (3.2%) T3 lesion. High nuclear grade (NG) was present in 9.7%, intermediate NG in 71%, and low NG in 19.3%. Three tumors (9.7%) were Her-2 positive, 4 (13%) were ER-negative, and 7 (22.6%) were PR-negative. LS demonstrated IMSN in 47.1% of the patients. Blue dye was used in 41% of the cases and was positive in 43% of them. None of the blue nodes were positive on LS but 1/3 were radioactive. The success rate of removing identified IMSNs was 91.2%. Seven patients had metastatic IMSN representing 25% (7/28) of the successfully biopsied invasive cancer patients. The tumor location in patients with positive IMSN was: 42.9% in the UIQ, 28.6% central, 14.3% in LIQ, and 14.3% in UOQ. Positive IMSN were associated with positive axillary nodes in 71.4% (P = 0.024). All the patients with positive IMSN were upstaged and received radiation to the internal mammary chain. In 5 (18%) of the 28 patients, the chemotherapy and radiation plans were changed. In the univariate and multivariate analysis, tumor size, location, NG, ER, PR, Her-2, and histology were not significant predictors of positivity.

Conclusion: A quarter of IMSN biopsies were positive and changed treatment in 18%. The accuracy of LS at detection of IMSN is less than 50%. There are no good predictors of IMSN positivity.
Four-Year Clinical Update From the American Society of Breast Surgeons MammoSite Brachytherapy Trial

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**Background:** Four-year update on treatment efficacy and complications of MammoSite Radiation Therapy System breast brachytherapy for patients enrolled in the American Society of Breast Surgeons (ASBS) Registry is presented.

**Methods:** One thousand four hundred forty-nine cases with early-stage breast cancer undergoing breast-conserving therapy were treated with the MammoSite device to deliver adjuvant, accelerated partial breast irradiation (APBI) (34 Gy in 3.4 Gy fractions). One thousand two hundred fifty-five cases (87\%) had invasive breast cancer (IBC) (93\% T1, 3\% N1, median size = 10 mm) and 194 cases (13\%) had DCIS (median size, 8 mm). Median follow-up for the entire group is 32.7 months.

**Results:** For the entire group of 1449 cases, the 3-year actuarial rate of ipsilateral breast tumor recurrence (IBTR) was 2.16\% (2.08 for IBC/2.75\% for DCIS, respectively). The 3-year actuarial rate of axillary failure was 0.62\%. Analysis of the first 400 cases with a median follow-up of 41.4 months showed a 4-year actuarial rate for IBTR of 2.16\% (2.45\% for IBC and 0.00\% for DCIS) and axillary failure rate of 0.87. Complication rates for the entire group include infection in 9.5\% (137/1449), seroma in 26.8\% (388/1449) (12.7\% of cases had symptomatic seroma), and fat necrosis in 2.0\% (29/1449). The percentages of patients with good/excellent cosmetic results at 12 (n = 986), 24 (n = 777), 36 (n = 508), and 48 months (n = 120 cases) were 95\%, 94\%, 93\%, and 95\%.

**Conclusion:** Loco-regional control, complications, and cosmesis from MammoSite APBI at the year update are acceptable and comparable to results seen with whole-breast radiation.
Recent Trends and Predictors in Immediate Breast Reconstruction After Mastectomy in the United States

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Introduction: Immediate breast reconstruction after mastectomy has increased in frequency over the past decade. Immediate reconstruction can be achieved by a variety of methods but socioeconomic and patient factors influencing reconstruction have yet to be fully identified.

Methods: Data were analyzed from the Nationwide Inpatient Sample (NIS) from the year 1999 to 2003. International Classification of Disease (ICD-9) codes were used to identify patients undergoing immediate breast reconstruction as an inpatient in U.S. hospitals. Multiple linear and logistic regression analyses are used to examine predictive variables for immediate breast reconstruction in the inpatient setting after mastectomy.

Results: Between 1999 and 2003, we identified a total of 469,832 patients undergoing mastectomy. Immediate breast reconstruction occurred as an inpatient on 110,878 patients for a 5-year average rate of 23.6% (range, 22.2%-25.3%). The most common method of reconstruction was by tissue expander (44.7% of cases). Muscle and pedicle flaps were infrequent (less than 10% of cases). Patients undergoing immediate reconstruction were younger (P < 0.001), more often Caucasian (P < 0.001), and had fewer comorbidities (P < 0.001). These operations were more often performed in urban centers (P < 0.001), were more often performed in teaching hospitals (P < 0.001), and the method of payment was more often private insurance for those undergoing immediate reconstruction and Medicare for those not undergoing reconstruction (P < 0.001). Using stepwise logistic regression analysis, predictors of immediate breast reconstruction after mastectomy include: private insurance [odds ratio (OR), 2.7, P < 0.001], hospital location in an urban location (OR 3.0, P < 0.001), a teaching hospital (OR 1.8, P < 0.001), Caucasian race (OR 2.1, P < 0.001), hospital region in the south (OR 1.3, P < 0.001), age between the third and sixth decades (OR 8.8, 8.0, 6.1, 3.7, P < 0.001) and low number of comorbidities (OR 3.4, P < 0.001).

Discussion: Immediate breast reconstruction after mastectomy is still not commonly performed in the United States. Socioeconomic as well as geographic factors play a significant role in whether patients undergo immediate reconstruction.
Latissimus Dorsi Miniflap Volume Replacement After Partial Mastectomy: The Use of Intraoperative Frozen Sections to Confirm Negative Margins

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Introduction: Breast tumors necessitating removal of more than 10% of the volume of the breast present an oncoplastic challenge. Latissimus dorsi miniflap volume replacement may be used to reconstruct the defect left after a large lumpectomy or partial mastectomy. In our institution intraoperative frozen sections are used to confirm negative margins before raising the muscle flap. This prospectively collected series was analyzed to quantify the proportion of breast tissue excised, to evaluate the ability of intraoperative frozen section to identify involved margins, and to document the incidence of local recurrence.

Methods: A lumpectomy is performed with 1-cm macroscopic margins. “Bed biopsies” are taken from superior, inferior, medial, and lateral margins and submitted for intraoperative frozen section analysis. Meanwhile, the cavity is inked in situ with methylene blue and re-excised. If the bed biopsies are free of disease, miniflap volume replacement is undertaken. If the frozen sections are involved, further bed biopsies and targeted re-excisions are taken. Patient demographic data, details of final pathology, and adjuvant treatment were recorded. To estimate the proportion of breast excised in this series of partial mastectomies, breast volume was calculated from preoperative mammography measurements and the weight of the specimen taken as an approximation to its volume. Local recurrences were recorded.

Results: Between April 1997 and April 2007, 110 partial mastectomies with latissimus dorsi miniflap volume replacement were completed. The median proportion of breast volume excised in partial mastectomies was 30% (range, 11%-72%). Frozen sections of bed biopsies were positive in 19% of patients and concurred with paraffin sections in 97% and re-excision findings in 96% of specimens. Clear margins were not attainable in 4 patients, 3 underwent immediate mastectomy. Only 3 patients required delayed re-excision and 1 mastectomy following misleading frozen section findings. Local recurrence occurred in 1 case (0.9%) at median follow-up of 51.4 months.

Conclusions: Latissimus dorsi miniflap volume replacement extends the role of breast-conserving surgery. The incidence of local recurrence is low despite excision of large tumors. Frozen section analysis of intraoperative bed biopsies allows a single-stage procedure with minimal chance of requiring additional surgery to clear margins.
Conservatively Treated Patients With DCIS Analyzed by Individual USC/VNPI Scores of 6, 7, 8, or 9

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**Introduction:** When the USC/VNPI was originally published, it was recommended that those who scored 4-6 would be treated with excision alone and that those who scored 7-9 be treated with excision plus radiation therapy. These groupings were made because there were insufficient patients to analyze each score individually. With passing time and increased accrual and follow-up, sufficient numbers of patients now exist for analysis by individual scores.

**Methods:** Six hundred sixty-one patients with USC/VNPI scores of 6, 7, 8, or 9 who were treated with breast conservation were included. The predicted probability of recurrence at 12 years is shown in the table below and was derived using the Kaplan-Meier method.

**Results:**

<table>
<thead>
<tr>
<th>USC/VNPI Score</th>
<th>All Recur</th>
<th>Inv Recur</th>
<th>All Recur</th>
<th>Inv Recur</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 (n = 179)</td>
<td>5.6%</td>
<td>2.5%</td>
<td>3.5%</td>
<td>0%</td>
</tr>
<tr>
<td>7 (n = 203)</td>
<td>26%</td>
<td>10%</td>
<td>13%</td>
<td>9%</td>
</tr>
<tr>
<td>8 (n = 172)</td>
<td>41%</td>
<td>17%</td>
<td>27%</td>
<td>12%</td>
</tr>
<tr>
<td>9 (n = 107)</td>
<td>80%</td>
<td>40%</td>
<td>43%</td>
<td>19%</td>
</tr>
</tbody>
</table>

**Conclusion:** These data support our previous recommendations. Patients who score 6 can be treated with excision alone with a low risk of local recurrence. Patients who score 7-9 benefit significantly from the addition of radiation therapy. Patients with margins less than 10 mm should be re-excised, if technically feasible, to lower their USC/VNPI score.
The Role of Oncotype DX™ Assay on Appropriate Treatment for Estrogen-Positive, Lymph Node–Negative Invasive Breast Cancer

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Objective: To evaluate the impact of the 21-gene recurrence score (RS) assay (Oncotype DX™) on adjuvant therapy for estrogen receptor–positive, lymph node–negative, invasive breast cancer.

Methods: Seventy-eight patients, aged 33-82 (mean age, 59), with estrogen receptor–positive, lymph node–negative, invasive breast cancer were evaluated with the Oncotype DX™ assay, Genomic Health. Prior to Oncotype DX, our criteria for recommending chemotherapy plus hormonal therapy (CHT) for premenopausal patients (age <50) were with tumors ≥5 mm and her-2/neu-positive or tumors ≥1 cm and her-2/neu-negative; postmenopausal patients (age >50) were with tumors ≥1 cm and her-2/neu-positive, or tumors ≥1.5 cm and her-2/neu-negative. Based on data from protocols B-14 and B-20 of the National Surgical Adjuvant Breast and Bowel Project (NSABP), patients with low RS (0-17) and intermediate RS (18-30) with the Oncotype DX™ assay will have little benefit to adjuvant chemotherapy over hormonal therapy alone. Patients with high RS (>30) have a significant benefit from CHT. Our criteria for CHT were then revised to incorporate the Oncotype DX™ RS and compared to previous recommendations.

Results: Seventy-eight patients were evaluated. Eighteen (23.1%) of the 78 were premenopausal and 60 (76.9%) of the 78 were postmenopausal. Of the postmenopausal patients, 48 (80%) of the 60 were ages 50-70, and 12 (20%) of the 60 were ages >70. Based on the Oncotype DX™ RS, 29 (37%) of the 78 patients were low risk, 40 (51%) of the 78 were intermediate risk, and 9 (12%) of the 78 were high risk. Using our revised criteria with the RS for recommending CHT, 10 (34.5%) of the 29 patients with low RS and 20 (50%) of the 40 patients with intermediate RS would have been advised not to undergo chemotherapy, but to have hormonal therapy alone. Two (22.2%) of the 9 patients with high RS, (both aged >70) were advised to undergo chemotherapy. Nineteen (65.5%) of the 29 patients with low RS, 20 (50%) of the 40 patients with intermediate RS, and 7 (77.8%) of the 9 had confirmed treatment recommendations with the Oncotype DX™ RS.

Conclusions: Prior to Oncotype DX™, 15 (83.32%) of the 18 premenopausal and 25 (52.05%) of 48 postmenopausal women would have been recommended CHT, for a total of 39 (50%) of the 78 premenopausal and postmenopausal patients. With Oncotype DX™, only 9 (12%) of the 78 premenopausal and postmenopausal patients would have been recommended CHT. The Oncotype DX™ has potential to change medical practice and optimize the benefit of appropriate chemotherapy. This finding will be further delineated with the Trial Assigning Individualized Options for Treatment (TAILOR Rx).

<table>
<thead>
<tr>
<th>RS</th>
<th>CHT→No CHT</th>
<th>No CHT→CHT</th>
<th>No CHT→No CHT Confirmed</th>
<th>CHT→CHT Confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>10/29 (34.5%)</td>
<td>0/29 (0%)</td>
<td>19/29 (65.5%)</td>
<td>0/29 (0%)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>20/40 (50%)</td>
<td>0/40 (0%)</td>
<td>19/40 (47.5%)</td>
<td>1/40 (2.5%)</td>
</tr>
<tr>
<td>High</td>
<td>0/9 (0%)</td>
<td>2/9 (22.2%)</td>
<td>0/9 (0%)</td>
<td>7/9 (77.8%)</td>
</tr>
</tbody>
</table>
II. DISCUSSION POSTER ABSTRACTS
Does Oncotype DX Recurrence Score Affect the Management of Patients With Early-Stage Breast Cancer?

Juhi Asad¹, Allyson Jacobson², Susan Boolbol², Alison Estrabrook¹, Sheldon Feldman², Michael Osborne², Sharon Rosenbaum Smith¹, Wendy Twardzik¹, Paul Tartter¹

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Introduction: Oncotype DX is a 21-gene assay that calculates a rate of distant recurrence in women with an estrogen receptor (ER)–positive, lymph node–negative breast cancer. Previously, clinical and pathological criteria were used to determine whether patients receive chemotherapy. The purpose of this study is to determine whether the recurrence score (RS) influences the decision to give chemotherapy in addition to adjuvant hormone therapy.

Methods: A retrospective study was performed on 66 patients with ER-positive, lymph node–negative breast cancer. Each had an Oncotype DX RS obtained to determine if they would benefit from chemotherapy. Patients were categorized into low risk (RS < 18), intermediate risk (RS, 18-30), and high risk (RS > 31) groups. Tumor size, differentiation, and treatment were then compared within each category. Statistical analysis was performed using SPSS software (SPSS Inc. Chicago, IL).

Results: There was no relationship between RS and tumor size. Tumors with a high RS were statistically more poorly differentiated.

<table>
<thead>
<tr>
<th></th>
<th>RS &lt; 18</th>
<th>18-30</th>
<th>&gt;30</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumor size (cm)</td>
<td>1.5</td>
<td>1.3</td>
<td>1.8</td>
<td>--</td>
</tr>
<tr>
<td>Differentiation (n):</td>
<td>Well</td>
<td>Moderate</td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>16</td>
<td>1</td>
<td>4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Fifty-one patients would have received chemotherapy by NCCN guidelines. As a result of the RS, only 35% of these patients were advised to have chemotherapy. Of 15 patients who would not have received chemotherapy per NCCN guidelines, 3 were advised to have chemotherapy because of high RS. For 59% of patients, the treatment was altered by the RS.

Conclusion: The Oncotype DX recurrence score is significantly related to tumor differentiation but not tumor size. In this study, the treatment of the majority of the patients was altered as a consequence of the Oncotype DX recurrence score.
Sentinel Lymph Node Biopsy in Patients With Multifocal/Multicentric Breast Cancer: Low False-Negative Rate and Lack of Axillary Recurrence

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Introduction: Sentinel lymph node biopsy (SLNB) has emerged as the standard method of axillary staging in breast cancer patients with clinically negative axillas. Multifocal (MF) and multicentric (MC) breast cancers have been considered relative contraindications to SLNB. This study retrospectively examines the sensitivity, specificity, false-negative rate, and rate of axillary recurrence following SLNB in patients with MF and MC breast cancers.

Methods: From 1999-2006, 93 patients with clinically node-negative MF/MC breast cancer underwent SLNB. Patients were divided into 2 groups: (1) patients who had a completion axillary lymph node dissection (ALND) regardless of SLN pathology (n = 41); and (2) patients who only had an ALND for a positive SLN (n = 52). Patient demographics, method of SLN localization, injection site, and final lymph node pathology were recorded. Axillary recurrence was used as a surrogate for the true status of the axilla in the group 2 patients.

Results: There were no differences between the 2 groups with respect to patient age, tumor size/grade, stage, and histology [70% invasive ductal, 14% invasive lobular, and 16% mixed/other (P > 0.05 for all)]. Method of SLN detection (70% blue dye only, 3% radiocolloid only, and 27% blue dye + radiocolloid) and site of injection of blue dye (71% peritumoral, 29% retroareolar) and radiocolloid (100% peritumoral) was also similar between the 2 groups (P > 0.05). The incidence of axillary metastasis was greater in those patients who had a planned ALND regardless of the SLN results (group 1; 28 of 41, 68%) compared to those who only had an ALND if the SLN was positive (group 2; 6 of 52, 12%) (P < 0.01). For patients in group 1, the sensitivity and specificity of SLNB were 93% and 100%, respectively, with a false-negative rate of 7%. The SLN was the only metastatic node in 43% of group 1 patients. Of the 52 patients in group 2 who only had an ALND if the SLN was positive, none experienced an axillary recurrence at follow-up (median, 4.8 years).

Discussion: The sensitivity, specificity, and false-negative rate of SLNB in MF/MC breast cancer are comparable to that observed in patients with unifocal breast cancer. Despite a lower rate of SLN positivity in those undergoing SLNB only, axillary recurrence is not observed. SLNB should be considered the standard of care for axillary staging in patients with MF/MC breast cancer and clinically negative axillas.
Quantity and Histologic Pattern of Atypical Ductal Hyperplasia Seen on a Breast Core Needle Biopsy Predict Ductal Carcinoma In Situ on Subsequent Excision

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Background: ADH diagnosed on core needle biopsy (CNB) is currently regarded as an indication for surgical excision as ~25% of excisional biopsies will reveal the presence of an adjacent in situ or invasive carcinoma. We investigated whether histologic features and extent of ADH in CNB specimens are predictive of the presence of carcinoma at excision.

Design: One hundred eighteen CNB cases with a diagnosis of ADH and subsequent surgical excision were identified from 2000-2007. All cases were reviewed and the diagnoses confirmed. The extent of ADH in CNB was assessed by determining the number of large ducts and/or terminal duct lobular units affected. The extent and histologic subtype of ADH in CNB were correlated with findings on the subsequent surgical excisions.

Result: The indication for CNB was calcifications, architectural distortion detected on mammography, and palpable mass in 105 cases, 12 cases, and 1 case, respectively. The median number of cores was 9 (range, 2-26). Of the 118 cases, ADH was restricted to ≤2 foci in 81 (68.6%) and involved more than 2 foci in 37 (31.4%) cases. The predominant histologic subtype was cribriform in 77 (65.3%), micropapillary in 32 (27.1%), and solid in 9 (7.6%) cases, respectively. The corresponding findings at excision were benign lesions without atypia (n = 55, 46.6%), focal residual ADH (n = 42, 35.6%), atypical lobular hyperplasia (n = 2, 1.7%), and ductal carcinoma in situ (DCIS) (n = 19, 16.1%). When the number of foci of involvement by ADH on CNB was correlated with the excisional biopsy results, ADH present in more than 2 foci was a strong predictor of adjacent DCIS on excision (13 of 37 vs 6 of 81 cases, \( P = 0.0003 \), Fisher’s exact test).

All 6 patients with ADH in ≤2 foci in CNB diagnosed with DCIS on excision had residual microcalcifications after CNB. When histologic subtype of ADH was evaluated, we found that micropapillary subtype significantly predicted the presence of DCIS (\( P = 0.0034 \), chi-square test).

Conclusion: Histologic subtype (micropapillary ADH) and the extent of ADH in CNB can predict the presence of a more significant lesion (DCIS) on subsequent surgical excision. Patients with ADH restricted to ≤2 foci may not need surgical excision, especially if the mammographic abnormality has been completely removed by CNB.
Surgical Outcomes of Locoregional Recurrence After Chest Wall Resection and Reconstruction for Breast Cancer

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Introduction: Locoregional chest wall recurrences requiring rib and/or sternal resection after mastectomy or breast conservation predict a poor outcome in many patients with breast cancer. However, the precise natural history and surgical outcome of recurrent chest wall breast cancer are not fully understood. The objective of this study is to clarify the clinicopathologic features of chest wall recurrence of breast cancer and evaluate prognostic factors predicting survival after radical chest wall resection and reconstruction (CWRK).

Methods: Twenty-eight patients underwent CWRK with the polypropylene (Marlex) mesh-methylmethacrylate sandwich technique between December 1999 and September 2007. Overall survival was calculated by the Kaplan-Meier method and the significance of prognostic variables evaluated by log-rank and Cox regression analyses.

Results: The postoperative morbidity and mortality was 21% and 0%, respectively. Median overall survival for all patients with recurrent breast cancer was 23.2 months with a 5-year overall survival rate of 18%. Patients with a disease-free interval less than 24 months (P = .03) and triple-negative phenotype (estrogen, progesterone, HER2) (P = .002) were the only significant independent predictors of overall survival in the multivariate analyses. The overall 1-, 2-, and 5-year survival rates for patients with triple-negative phenotype of recurrent breast tumor (n = 13) were 38%, 23%, and 0%, respectively. In contrast, the overall 1-, 2-, and 5-year survival rates for non–triple-negative phenotype (n = 13) were 100%, 70%, and 39%, respectively.

Discussion: Radical chest wall resection can be done with negligible mortality and acceptable morbidity to accomplish long-term palliation for patients with recurrent breast carcinoma. The strongest predictor of overall survival was the triple-negative phenotype. Because the triple-negative phenotype is not amenable to any form of targeted therapy, palliative resection may be warranted. Efforts should be underway to develop appropriate targeted therapies to this population of patients.
Regional Variation in Breast Cancer Treatment Throughout the United States

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Introduction: It has been proposed that initial treatment for breast cancer varies greatly across the United States. This variation has been attributed to a host of factors: race, economic status, and age at time of presentation. One question that has not been answered completely, however, is whether or not geographic location itself is an independent variable with regard to treatment.

Methods: The American College of Surgeons National Cancer Database Benchmark Reports were used to examine initial breast cancer treatment performed throughout the United States during the study period 1999-2003. Data were reviewed regarding: initial treatment performed, stage at time of presentation, race, and age at time of presentation. These data were then stratified with regard to geographic region in accordance with the United States Census Bureau classifications.

Results: There was a statistically significant relationship between geographic region and initial treatment of breast cancer. Specifically, the highest percentage of patients offered breast conservation therapy was seen in the Northeast and the lowest in the South. This difference was not due to a skewed age distribution, since there was no significant difference in age at presentation with regard to region. Though there were statistically significant relationships between race and geographic region and stage and geographic region, when the data were corrected for stage and race, the regional differences persisted. Stage-for-stage and within each racial cohort, the geographic differences in treatment were still statistically significant.

Discussion: This review suggests that geographic location within the United States is an independent variable with regard to breast cancer treatment. This regional influence does not appear to be due to racial distributions, stage variability, or age differences. Rather, the regional differences seen are likely due to a host of interrelated factors: availability of resources, access to healthcare resources, socioeconomic status, educational level, local physician bias regarding “appropriate” treatment, and physician education. Whether or not such diverse regional patterns of treatment can be altered or “normalized” is a question whose answer must await further in-depth analysis.
III. POSTER ABSTRACTS
Mucinous Breast Carcinoma: A Large Contemporary Series

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Introduction: Mucinous breast cancer is an uncommon subtype typically associated with a favorable prognosis. The literature suggests that this subset of patients might be treated less aggressively, given their lower risk of recurrence and mortality. This study aimed to assess recent trends and prognostic features in the treatment of mucinous breast carcinoma.

Methods: A retrospective review of our prospectively maintained database of patients who presented with mucinous breast cancer between 1997 and 2004 was performed. We evaluated age at diagnosis; surgical treatment; hormone receptor status; nodal evaluation and status; and the use of adjuvant chemotherapy, endocrine therapy, or radiotherapy (RT). We also examined the relationships between these factors and risk for locoregional recurrence.

Results: Of the 111 patients who presented with mucinous breast cancer, the median age at diagnosis was 56 years and the median follow-up was 63 months. Breast-conserving therapy (BCT) with adjuvant radiotherapy was performed in 71 (64%), while 3 (3%) had BCT without radiotherapy, and 37 (33%) were treated with mastectomy. Axillary staging was performed in 96 (86%) by sentinel node biopsy (SLNB) or axillary node dissection (ALND). Fourteen (13%) had lymph node metastasis and node positivity was associated with larger tumor size; node-positive patients had a mean tumor size of 2.7 cm, compared to 1.5 cm for node-negative patients (P = 0.0003). No patients with tumor sizes less than 1 cm had lymph node metastasis. Hormone receptor status, 94% were ER-positive and/or PR-positive. Ninety (90%) of hormone receptor–positive patients were treated with adjuvant endocrine therapy. Thirty-seven (33%) patients had chemotherapy. There were no breast cancer–related deaths in this cohort. One patient developed a local failure, 3 patients had distant recurrence, and 1 patient had both.

Discussion: Mucinous breast cancer is associated with low rates of local and distant recurrence and outstanding 5-year disease-free survival. Axillary staging by SLNB and the administration of adjuvant RT and endocrine therapy following BCT for mucinous cancer were common. Given that no patient with a tumor less than 1 cm had lymph node metastasis, consideration for deferring nodal evaluation may be made.
Axillary-Conserving Surgery Is Facilitated by Neoadjuvant Chemotherapy of Breast Cancer

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Introduction: The principal rationale for neoadjuvant chemotherapy (NCT) of breast cancer is facilitating breast-conserving surgery (BCS) by downstaging the primary lesion. This study examines the downstaging role of NCT for axillary lymph node (ALN) metastasis thereby facilitating axillary-conserving surgery (ACS).

Methods: Utilizing the institutional prospectively maintained database containing more than 7000 cases from 1989-2006, the records of patients with breast cancer receiving NCT and pathological ALN assessment were reviewed.

Results: Of 388 cases, 243 had a clinical diagnosis of ALN metastasis (cN+) and 145 were clinically ALN negative (cN-). ALN biopsy in 126 patients confirmed the cN+ diagnosis in 97% (86/89) and the cN-diagnosis in 73% (27/37). Pre-NCT, ALN dissection (ALND) or sentinel lymph node dissection (SLND) confirmed the cN+ diagnosis in 95% (18/19) and the cN- diagnosis in 76% (29/38). Post-NCT, 27% (65/243) of cN+ and 36% (52/145) of cN- patients had BCS. The breast pathological complete response (pCR) rate was 16% (40/243) for cN+ and 19% (28/144) for cN- patients. Of 59 patients having SLND post-NCT, metastasis was confirmed in 73% (22/30) of cN+ and 28% (8/29) of cN- patients. Of 272 patients having ALND post-NCT, metastasis was confirmed in 78% (152/194) of cN+ and 45% (35/78) of cN- patients. The ALN pCR rate was 22% (52/233) for cN+ and 58% (67/115) for cN- patients. Post-NCT ALND in pN0 patients occurred in 116 patients.

Discussion: It is accepted that NCT downstages the breast cancer and facilitates BCS. NCT for breast cancer has a similar or greater downstaging effect on ALN metastasis. SLND is accepted as an accurate reflection of ALN metastasis in patients treated surgically prior to adjuvant chemotherapy. In experienced hands, SLND can be performed post-NCT with similar success and accuracy. Pre-NCT, minimally invasive biopsy of ALNs in cN+ patients adds little to the understanding of the extent of disease and should not commit the patient to post-NCT ALND. Pre-NCT, SLND in cN- patients may commit patients with ALN metastasis pre-NCT to unnecessary ALND post-NCT. Post-NCT, minimally invasive biopsy of clinically metastatic nodes and SLND of patients without documented post-NCT node metastasis are recommended. Both BCS and ACS are facilitated by NCT of breast cancer.
Ductoscopy in the Therapeutic Management of Patients With Pathologic Nipple Discharge

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Introduction: Ductoscopy has been widely reported to play an important role in the diagnosis of intraductal disease that allows direct visual access to the mammary ducts using fiber-optic microendoscopes. However, its potential use in the therapeutic ablation of the intraductal lesions and/or in guiding to localize those ducts with pathologic lesions to be surgically excised requires further research and evaluation.

Methods: Between February 2006 and August 2007, ductoscopy was applied to 105 consecutive patients presenting with pathologic nipple discharge. Preoperative evaluation of patients included radiologic imaging, including mammography and/or ultrasonography as clinically indicated. A fiber-optic ductoscope was used in all cases by using a 1.1-mm or 0.55-mm-Polydiagnost miniendoscope (GmbH, Pfaffenhofen, Germany).

Results: Intraductal papilloma was identified as intraluminal growths in 23 patients with normal findings in ductal lavage cytology, and intraductal carcinoma was detected as duct wall irregularities in 1 patient with atypical cells in ductal lavage cytology. Eighteen patients with intraductal papilloma underwent ductoscopy-guided excisional biopsy through nipple orifice cannulation and ductoscopic exploration under local anesthesia. The remaining 6 patients underwent ductoscopy-assisted specific duct excision under general anesthesia followed by a circumareolar incision. At the day of the surgery, the specific duct where the lesion was visualized through the ductoscope was marked with methylene blue dye to localize the duct to be surgically removed in all 6 cases. Furthermore, additional marking with a polypropylene suture was required in 1 patient to localize a lesion in a small branch of the main duct 6 cm far from the nipple orifice under ductoscopic visualization. The patient with intraductal carcinoma in situ underwent simple mastectomy because of positive margins in the excisional biopsy as definitive surgery.

Discussion: Ductoscopy identifies intraductal disease with high accuracy, and avoids unnecessary surgery in women with pathologic nipple discharge by allowing intraductal therapeutic excisional biopsy of pathologic lesions. Furthermore, ductoscopy-guided surgery may potentially increase the yield of specific lesions by surgical excision of the specific duct where the intraductal lesion has been marked by ductoscopy.
Patient and Tumor Characteristics in Young Women (<40 years) With Breast Cancer Account for Increased Mortality

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Introduction: Previous studies have reported that young women (<40 years) with breast cancer are diagnosed at a more advanced stage and have lower survival compared with older women (≥40 years). The patient and tumor characteristics contributing to this difference are unclear. The goal of the current study is to identify predictors responsible for mortality disparities between young and older women.

Methods: Clinical, demographic, and pathologic data from all breast cancer patients treated at our institution are prospectively recorded in a database. We reviewed this database and identified 344 patients <40 years old who were treated for breast cancer between 1998 and 2006. During this same time period, 3252 women ≥40 years were treated for breast cancer. Using multivariate Cox regression models to calculate adjusted hazard ratios (aHR) and 95% confidence intervals (CI), we compared overall breast cancer mortality in women <40 years and women ≥40 years to determine survival differences, controlling for potential confounding variables identified in univariate tests.

Results: Of the 3596 patients treated for breast cancer between 1998 and 2006, 9.6% were <40 years (mean, 36 ± 4 years), while 90.4% were ≥40 years (mean, 60 ± 13 years). Compared with older women, young women were more likely to be African American (12% vs 28%, P < 0.01) and have a family history of breast cancer (18% vs 41%, P < 0.001). Young women were also more likely to be diagnosed at later stages, have bilateral breast cancer at the time of diagnosis, and be treated by mastectomy (P < 0.05 for each). Tumors in young women were more likely to be T2/T3, grade III, ER-negative, PR-negative, and lymph node–positive (each, P < 0.01). After controlling for all potential confounders identified in univariate tests, young women (<40 years) with breast cancer were more likely to die compared with older women (≥40 years) (aHR 1.52; CI, 1.37-1.74).

Discussion: Young women (<40 years) with breast cancer are diagnosed at a more advanced stage and have tumors with poor prognostic features. Overall, young women (<40 years) are 52% more likely to die from breast cancer compared to older women (≥40 years). Further studies are needed to identify the specific tumor biology contributing to the increased mortality of young women with breast cancer.
Predictors of Primary Breast Abscesses and Recurrence

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Introduction: A significant proportion of benign breast abscesses recur despite adequate antibiotic treatment and surgical drainage. We investigated the patient and microbiological risk factors that predispose to recurrence.

Methods: Patients with a primary benign breast abscess requiring surgical incision and drainage between January 1, 2000, and December 31, 2006, were included in this retrospective study. Patients were considered to have a recurrent breast abscess if they required a repeat drainage procedure in the same breast quadrant within 6 months.

Results: During the study period, 115 patients were surgically treated for a breast abscess. Of these, 26 had breast cancer and were excluded from the study. Of the remaining patients with primary breast abscesses (n = 89), 12 (14%) were lactational and 77 (86%) were nonlactational. None of the lactational abscesses recurred, whereas 43 (57%) of the nonlactational abscesses recurred (P < 0.01). Overall, compared to the general population, patients in the primary breast abscess group were predominantly African-American (64% vs 12%), had higher rates of obesity (BMI > 30, 43% vs 22%), and were tobacco smokers (45% vs 23%, P < 0.01 for all). In multivariate logistic regression analysis, age; sex; race; co-morbid conditions, including diabetes and hypertension; co-existent formulary drug use; alcohol consumption; and illicit drug use did not significantly predispose to recurrence. The only factor that was significantly associated with recurrence was tobacco smoking (P = 0.003). Patients with recurrent breast abscesses also had a distinct pattern of microbial infections compared to patients with nonrecurrent abscesses with a higher incidence of mixed bacteria (20% vs 9%), anaerobes (5% vs 0%), and Proteus (9% vs 5%) but lower staphylococcus (5% vs 25%) (P < 0.05 for each).

Discussion: Risk factors for developing a primary breast abscess include African-American race, obesity, and tobacco smoking. Furthermore, smoking significantly predisposes to the risk of recurrent abscess requiring repeated surgical drainage. There is a higher incidence of mixed bacterial and anaerobic infections in patients with recurrent breast abscesses. Therefore, there may be a role in treating smokers with broader antibiotic coverage.
Circulating Tumor Cells in Patients Undergoing Surgery for Primary Breast Cancer: Preliminary Results of a Pilot Study

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Introduction: Circulating tumor cells (CTCs) have recently been shown to be an independent predictor of progression-free and overall survival in patients undergoing treatment for metastatic breast cancer. This study evaluates the presence and significance of CTCs in patients undergoing surgical resection of clinically localized primary breast cancer.

Methods: Patients undergoing surgery for clinically localized primary breast cancer were enrolled in this prospective study. Four 7.5-cc vials of peripheral blood (total volume, 30 cc) were drawn preoperatively (preop) and at 2 weeks postoperatively (postop). The samples were centrifuged and the sera combined to a final volume of 7.5 cc, and the CellSearch (Veridex, LLC) system was used to identify circulating epithelial cells. Data was collected on other prognostic factors, including tumor size, grade, hormonal receptor status, proliferative index, HER-2 expression, and regional lymph node involvement.

Results: Thirty patients with primary breast cancer were enrolled at a single tertiary referral center. The mean age was 60. Primary tumor size was <2 cm (n = 9), 2-5 cm (n = 19), and >5 cm (n = 2). Ten patients (33%) had detectable CTCs preop, with the mean number of CTCs found being 1.3 (range, 0-21). Twenty-two patients had blood drawn postop and 8 (36%) were found to have CTCs. Three of these patients had positive CTCs both preop and postop, while 5 had detectable CTCs only in the postop specimen. Overall, 15 patients (50%) were found to have CTCs, either preop or postop. Based on T stage, the likelihood of any detectible CTCs was T1: 45%, T2: 50%, and T3: 100%. Based on N stage, the likelihood of CTC detection was N0: 35%, N1 or greater: 69%.

Conclusions: This preliminary data suggests that CTCs are detected in breast surgery patients 50% of the time. The likelihood of detecting CTCs doesn’t appear to correlate with T stage, but does appear to correlate with pathologically positive nodes. Further study will allow correlation with other pathological variables. Long-term clinical follow-up is required to determine the clinical significance of CTCs in patients undergoing breast surgery.
Significant Variation in the Management of Noninvasive Breast Carcinomas in the UK: Initial Findings From The Sloane Project, a UK National Prospective Audit

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Introduction: The Sloane Project aims to gain definitive answers regarding the diagnosis, treatment, and clinical outcomes of screen-detected noninvasive breast cancers.

Methods: Since 2003, data on defined radiological and pathological characteristics and details of surgical and adjuvant treatment are collected by screening units across the UK. All cases are followed up and the incidence of local recurrence, contralateral breast cancer, metastases, and death are determined.

Results: By April 2007, 3500 cases from 71 UK breast screening units have been submitted. Worrying variations in pathological assessment and clinical management are clearly apparent. The data indicate varying approaches between units to the use of wide local excision (WLE) and mastectomy for DCIS (69.4% vs 30.6%). Axillary management also varies, with nodes being removed in 8.18% of WLE cases and 73.35% of mastectomy. Startlingly, the range of number of nodes being taken is 1 to 20. Differences in the use of adjuvant therapies between units are also apparent, with the proportion of cases referred for radiotherapy following WLE varying from 0% to 97% and the use of hormone therapy from 0% to 91%. The data also indicate a wide variation in the assessment of estrogen (ER) receptor status (0% to 100%) and definition of a positive status.

Conclusions: The variation in management informs us that breast cancer professionals in the UK are not convinced regarding the optimal method to treat DCIS. The Sloane Project will collect data on the outcome of women who are receiving a wide range of treatments and as such will conclusively define which treatments are optimal given the radiological and pathological features.
Postoperative Pain Reduction Following Mastectomy Using Local Wound Infiltration

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Background: Postoperative pain (POP) following breast procedures continues to be of great concern. Botulinum toxin (BT) has been proven effective to reduce postoperative pain following tissue expander placement but is expensive for routine use. The effectiveness of intraoperative bupivacaine or BT wound infiltration versus nothing, following mastectomy without reconstruction, was evaluated.

Study Design: An IRB-approved retrospective review was performed to evaluate POP characteristics in 153 patients who had mastectomy without immediate reconstruction at a single institution from January 2003 through December 2006. Patients were divided into 3 groups, on review, into those who received bupivacaine, those who received BT, and those who received no local wound infiltration (control group). Characteristics evaluated included visual analog scale (VAS) pain rating, postoperative narcotic use, and patient-controlled analgesia (PCA) use.

Results: Fifty-one patients had no local wound infiltration, 40 patients received bupivacaine, and 62 patients receive BT. There was a statistically significant difference in postoperative VAS between those who received bupivacaine versus nothing (2.02 ± 2 vs 3.67 ± 2; $P = 0.001$) and bupivacaine versus BT (2.02 ± 2 vs 4.06 ± 3; $P = 0.0001$). In addition, the decreased postoperative narcotic use (milligrams of morphine or morphine equivalents) among those who received bupivacaine compared to the other groups was significant [bupivacaine versus nothing (1.99 ± 4 vs. 4.45 ± 4; $P = 0.002$); bupivacaine versus BT (1.99 ± 4 vs. 4.53 ± 4; $P = 0.002$)]. There was no significant difference in PCA use during hospitalization or VAS at the first postoperative visit.

Conclusions: Bupivacaine demonstrated significantly better postoperative pain control when compared to BT or no wound infiltration. It provides an effective and inexpensive method to reduce postoperative pain and narcotic use among patients undergoing mastectomy.
Sentinel Node Biopsy Does Not Positively Impact Patient Care for Women With Ductal Carcinoma In Situ

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Introduction: Controversy exists in both the literature and clinical practice regarding the use of axillary nodal staging in women with ductal carcinoma in situ (DCIS) of the breast. This study was performed to review a single institution’s experience to determine the rate of identifying nodal metastases and whether or not this information was employed to direct additional locoregional or systemic therapy.

Methods: A retrospective review of all cases of DCIS diagnosed from 1999 through 2004 was performed using our institution’s tumor registry. Cases in which axillary lymph nodes had been obtained were reviewed to determine the type of axillary procedure performed. For those patients who had undergone sentinel node biopsy and were identified as having metastases, the registry and charts were reviewed to identify those patients who received additional locoregional and systemic therapy and the outcomes of those treatments.

Results: Sentinel lymph node biopsy performed for a diagnosis of DCIS was positive in 14 (17.7%) of 79 patients. Six of 14 patients had metastases detected only immunohistochemically, 5 had micrometastases and 2 had metastases. One patient had a false-positive sentinel node on touch prep cytology but was negative on formal pathologic evaluation. Only 1 of the 79 patients who underwent sentinel lymph node biopsy for DCIS was found to have an invasive cancer on final pathology. Seven (50%) of 14 patients with positive sentinel lymph nodes had additional locoregional and/or systemic therapy.

Conclusion: In a single-institution review, sentinel lymph node biopsies performed for ductal carcinoma in situ benefited few patients and may have led to unnecessary additional surgery and/or adjuvant therapy.
Incidence of Clinically Significant Seroma After Breast and Axillary Surgery
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Introduction: Seroma after breast and axillary surgery occurs at rates ranging from 3 to 81%. The aims of this study were to identify the incidence of seroma, to assess variation based on surgical procedure, and to determine if seroma occurrence was associated with an increased rate of surgical site infection (SSI).

Methods: A retrospective chart review was performed of 455 breast ± axillary procedures between July 2004 and June 2006 in 386 patients. Drains were placed routinely at total mastectomy (TM) or axillary dissection (ALND) and were removed when drainage was less than 30 ml/day for 2 consecutive days. Seroma was defined as a fluid collection requiring 1 or more aspirations or subsequent placement of a drain and SSI was defined by definite cellulitis or purulent drainage. Chi-square tests were used to compare the proportions developing seroma across surgery types and to assess the relationship between seroma formation and SSI.

Results: Among 455 procedures, 57 seromas (12.5%) required intervention. Surgical drains were removed at a median of 11 days after surgery. Seroma intervention occurred at a median of 17 days after surgery for patient groups with and without surgical drains. Forty-one (72%) of the seromas were treated with aspiration only, 5 (9%) with drain placement only, and 11 (19%) with multiple methods, including sclerotherapy (3) and capsulectomy (2). Seroma rates by procedure were as follows: breast-conserving surgery (BCS) + sentinel node (SN), 15/165 (9.1%); BCS + ALND, 3/26 (11.5%); TM, 9/62 (14.5%); TM + SN, 24/157 (15.3%); TM + ALND, 6/45 (13.3%). No statistically significant difference in seroma frequency was seen across all procedures ($P = 0.53$), or between procedures managed with a surgical drain 42/290 (14.5%) and without 15/165 (9.1%), $P = 0.09$. A concurrent or subsequent SSI was diagnosed in 8 (14%) of 57 patients with seroma compared to 25 (6%) of 398 patients with no seroma ($P = 0.03$).

Conclusions: Seroma requiring intervention occurs in 10-15% of cases after breast surgery and does not vary significantly for procedures managed with or without surgical drains. Seroma appears to be associated with an increased rate of surgical site infection.
Ultrasonography in a Breast Surgical Practice: A Personal Experience in 2808 Cases

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Introduction: Ultrasonography has become increasingly important in breast diagnosis over the past 2 decades. Breast ultrasound (US) is useful to help differentiate benign and malignant lesions, for guidance to aspirate or biopsy nonpalpable nodules, and to further define mammographic abnormalities. Breast US is also useful intraoperatively to localize nonpalpable lesions and to assess for clear surgical margins in cases of malignancy.

Methods: Two thousand eight hundred eight consecutive cases using breast ultrasonography from January 1998 to August 2006 were reviewed retrospectively for indications, findings, and follow-up. Cytology and pathology reports were compared to mammographic and US findings for concordance. Results of fine needle aspiration (FNA) cytologies and core biopsies were analyzed, as were cases in which intraoperative US was employed.

Results: Of 1219 diagnostic ultrasound examinations, the majority were done for breast thickening, a lump or lumpiness discovered by the patient or the referring physician. One hundred sixty-four (13.5%) of these were in patients at high breast cancer risk. US-guided FNA, selected for benign appearing nodules and cystic change, was done in 933 cases. Among these, 46 cases highly suspect for cancer by mammography were confirmed by FNA cytology, and 8 cases were considered suspicious for cancer. Of 505 US-guided core biopsies, 205 (40.6%) were carcinomas. US was used intraoperatively in 151 cases. In 47 of these cases diagnosed as invasive carcinomas preoperatively, all were excised with clear surgical margins.

Discussion: The use of US in a breast surgical practice offers the surgeon significant advantages in the evaluation and diagnosis of breast lesions. These include: (1) The ability to differentiate benign from malignant nodules by US-guided cytology and core biopsy. (2) US-guided core biopsy can confirm a preoperative diagnosis in a nonpalpable solid nodule and aid in surgical planning. (3) Intraoperative US can localize nonpalpable lesions, eliminating the need for wire localization and facilitate OR scheduling. (4) Intraoperative US is an effective tool to assess for surgical margins, minimizing the need to return to the operating room for re-excision.
Optimal Treatment of Multiple Ipsilateral Primary Breast Tumors

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Introduction: Multiple ipsilateral invasive breast cancers have traditionally been treated with mastectomy. The success of breast conservation therapy (BCT) for these patients is not well documented.

Methods: Patients treated at a single institution were retrospectively reviewed. Those with 2 or more invasive cancers separated by normal breast tissue were included, while those with 1 invasive cancer and additional lesions of DCIS were excluded.

Results: One hundred forty-nine patients were treated over 19 years. Fifty-eight (39%) patients underwent BCT, while 91 were treated with mastectomy. Patients presented equally with palpable mass or a mammographic abnormality. Preoperatively, multiple tumors were suspected in 62% (36) of BCT patients and 75% (68) of mastectomy patients. The majority of patients had 2 separate tumors and 1 histology (Table 1). Patients with multiple tumors in 1 quadrant were predominantly treated by BCT (Table). Seventy-four percent (43) of BCT patients and 73% (65) of mastectomy patients had sentinel lymph node biopsy (SLNB). Of those, 27% (29) were SLN positive and underwent an axillary dissection. Average follow-up was 48.2 months. Eighty-eight percent (121) had more than 1 year of follow-up. Ten patients recurred: 1 nodal, 1 local, and 8 distant. Both local and nodal recurrences were in BCT patients, for an overall locoregional BCT recurrence rate of 3.4%. No regional recurrence in patients with SLNB.

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Discussion: Patients with multiple ipsilateral invasive breast cancers can safely undergo breast conservation therapy with a low risk of recurrence. SLNB can be performed in a majority of patients accurately and with minimal risk of regional recurrence.
Factors That Influence the Rate of Re-excision Following Lumpectomy for Breast Cancer

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Introduction: About 20% to 40% of patients who undergo lumpectomy for breast cancer require re-excision because of positive or close margins. This rate of reoperation would not be acceptable in any other area of surgery. The purpose of this study is to evaluate clinical and biological factors associated with the need for re-excision.

Methods: A prospectively collected database was used to review all breast cancer cases undergoing initial lumpectomy at our breast center between July 2002 and June 2007. The group that required re-excision was compared to the larger group that did not.

Results: Of 576 patients who underwent initial lumpectomy, 160 (28%) required re-excision, with 47 (8%) eventually having a mastectomy and 113 (20%) a wider lumpectomy. The group requiring re-excision was slightly younger (mean age, 53 vs 56, \( P < .05 \)), but there was no difference by race. Tumor size correlated strongly with the initial decision for lumpectomy as opposed to mastectomy, but once lumpectomy was chosen, it did not correlate with the rate of re-excision. Tumor histology, however, greatly influenced the re-excision rate with DCIS, infiltrating lobular, and infiltrating ductal with an extensive intraductal component all significantly greater than pure infiltrating ductal (39%, 42%, 38% vs 19%, respectively, all \( P < .01 \)). Interestingly tumors that overexpress Her-2 also had a higher re-excision rate (31% vs 17%, \( P < .01 \)) but estrogen receptor, progesterone receptor, and nodal status did not have an effect. Clinical factors that decreased the re-excision rate included diagnosis by needle biopsy as opposed to excisional biopsy (16% vs 40%, \( P < .01 \)) and use of neoadjuvant chemotherapy (11% vs 29%, \( P < .05 \)). While careful preoperative breast imaging is certainly important, use of preoperative MRI did not influence rate of re-excision in this study.

Conclusions: Recognition of factors associated with positive margins and judicious use of needle biopsy and neoadjuvant chemotherapy may offer opportunities to reduce the rate of re-excision following lumpectomy for breast cancer.
The Validity of the Gail Model in Women With LCIS

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Introduction: Lobular carcinoma in situ (LCIS) is a well-established risk marker for developing breast cancer. Although the Gail model is widely used as a risk assessment tool for breast cancer, it is not clear how accurately this model predicts breast cancer risk for women with LCIS. The purpose of this study was to investigate the validity of the Gail model risk scores in a population of women with LCIS.

Methods: The Women At Risk (WAR) Registry provided the study population. The enrollment criteria for this group has been previously published. The WAR Registry was queried for women with a biopsy-proven history of LCIS. We calculated the 5-year Gail score for women in the registry defining LCIS as atypical hyperplasia, and compared these with Gail scores excluding LCIS. In order to evaluate the impact of various risk factors on the risk of developing breast cancer, we used the survival analytic technique of the Cox proportional hazards regression model with months of follow-up as the time scale. All tests were 2-sided and conducted at the 0.10 level of significance. Ninety-five percent confidence intervals for hazard ratios were also calculated.

Results: Of 1729 women in the WAR Registry, 371 had a biopsy-proven history of LCIS. The median age at diagnosis was 52 years (range, 20-83). Nineteen (5%) of 371 women developed breast cancer during a median follow-up of 60 months. The average time to develop breast cancer was 4 years. Fifteen of the 19 cancers were ductal in origin (5 DCIS, 10 IDC) and 4 were ILC. The cancers were evenly distributed between the breast where the LCIS was diagnosed and the contralateral breast. The Gail Model ($P = 0.01$) was a statistically significant predictor of breast cancer in our population. The presence of a family history of breast cancer (FHBC) increased the risk associated with LCIS ($P = 0.04$).

Conclusions: Our data support the understanding of LCIS as a global risk factor for breast cancer development. FHBC may potentiate the risk associated with LCIS. Although LCIS was not included in the category of atypical hyperplasia when the model was originally developed, it may be included in this category for the purpose of this risk assessment tool.
Ultrasound-Guided Axillary Lymph Node Biopsy: Changes From Fine Needle Aspiration to Core Needle Biopsy

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Introduction: Axillary ultrasound (AUS)-guided biopsy is an established method of preoperative surgical staging for invasive breast cancer. In our institution, there has been a recent move away from fine needle aspiration (FNA) to core needle biopsy (CNB) of abnormal nodes. This study compares AUS (with or without either biopsy technique) findings to sentinel and axillary lymph node surgical pathology.

Methods: Records from patients diagnosed with operable invasive breast cancer from 2004-2006 who underwent preoperative AUS with or without biopsy and their surgical pathologic findings were reviewed.

Results: Two hundred forty-two patients underwent a preoperative AUS. Forty percent were abnormal, and 88% of these were biopsied. From 2004 to 2006, total annual AUSs and biopsies performed increased 56% and 54%, respectively, and in 2006, 93% of all abnormal nodes were biopsied. From 2004-2005, 90% of biopsies were FNAs, but a shift toward CNB occurred in 2006, with 78% of biopsies now performed via CNB. Excluding patients who underwent neoadjuvant chemotherapy, the sensitivity of AUS (with biopsy if indicated) was 36%. Overall specificity was 98%, with positive and negative predictive values of 91% and 78%, respectively. When compared to FNA, CNB showed a higher true-positive rate (44% vs 28%) with similar false-positive rates (3-4%). CNB had a slightly lower true-negative rate (40% vs 53%) and a 0% false-negative rate (0% vs 6%).

AUS results compared to sentinel node intraoperative cytopathology showed another advantage of CNB: Of 9 patients with benign CNBs, there was no positive intraoperative cytopathology, compared to a positive cytopathology rate of 12% for patients with benign FNAs.

Conclusions: These results correlate favorably with published reports of AUS. Preoperative AUS should be included in the preoperative workup of clinically negative-node patients. A positive biopsy eliminates the need for a sentinel node biopsy and patients can proceed directly to axillary lymph node dissection. Core needle biopsy is superior to FNA regarding false negatives and, in this select group, a negative CNB may eliminate the need for intraoperative cytopathology during sentinel node biopsy.
Vascular Calcifications Identified on Screening Mammography Indicate Increased Risk of Coronary Artery Disease and Diabetes

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Objectives: In the United States heart disease (CAD) and diabetes are significant causes of morbidity and mortality in women. Fifty million women undergo routine mammographic screening yearly. Prior studies have indicated benign vascular calcifications identified on routine screening mammography are more prevalent in women with CAD, diabetes, and peripheral vascular disease (PVD). This large prospective study investigates the association of vascular calcifications identified on screening mammography and the presence of CAD, diabetes, and PVD.

Methods: We prospectively consented 1000 women undergoing routine screening mammography to answer a health questionnaire regarding their history of CAD, diabetes, and PVD. All screening mammograms were read by dedicated mammogram radiologists, blinded to the questionnaire results, who recorded presence or absence of vascular calcifications. The Cochran-Mantel-Haenszel statistical method was used to determine the association of mammographic vascular calcifications and a history of CAD, diabetes, and PVD.

Results: We identified a highly significant association of mammographic vascular calcifications and a history of CAD and diabetes ($P < 0.0001$, 95% CI) but not PVD. The odds-ratio of having diabetes or CAD with vascular calcifications on screening mammography is 4.3 and 3.6 times greater than the odds of having these diseases without mammographic vascular calcifications irrespective of age.

Conclusions: This large prospective study indicates a significant association between vascular calcifications identified on screening mammography and a personal history of CAD and diabetes. Future studies will investigate the utilization of mammography as a screening tool for CAD and diabetes, which may significantly impact the morbidity and mortality associated with these prevalent diseases.
Case Report of Cutaneous Follicle Center B-Cell Lymphoma of the Breast
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Introduction: Surgeons often encounter cutaneous lesions that may be difficult to distinguish from inflammatory breast cancer. Skin biopsy is necessary.

Methods: We present the case of a 49-year-old woman who presented with a persistent rash on her left breast. She has a history of intermittent left spontaneous nipple discharge, negative ductogram, and benign mammograms and breast MRIs. Family history is notable for 2 maternal first cousins with breast cancer and a maternal aunt with ovarian cancer. Breast and regional lymph node exam was notable for clear left nipple discharge and erythematous macular rash on the lower inner breast. She underwent skin biopsy.

Results: Biopsy initially showed pseudolymphoma, and the patient was observed. The rash persisted for several years. Repeat skin biopsy showed primary cutaneous follicle center B-cell lymphoma (PCFCL). The patient underwent staging workup for lymphoma, including PET-CT scan and bone marrow biopsy, which showed no evidence of disease elsewhere (T2aN0M0). She is being treated with topical nitrogen mustard cream.

Conclusions: PCFCL is very rare, and has not been described in the breast elsewhere in the literature. Its course is quite indolent, and initial biopsies may show pseudolymphoma. Therefore, patients should be closely followed and repeat biopsies may be necessary to confirm the diagnosis. Systemic disease should be excluded. Five-year survival exceeds 80% if disease is localized. Recurrence is high with surgical excision alone. Topical chemotherapy and radiation are mainstays of treatment.
3D Reconstructed MIP Breast MRI Imaging Helps Guide Surgical Management of Breast Cancer

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Objective: This study examines whether 3D volume reconstructed breast MRI subtraction maximum intensity projection (MIP) images rotated and viewed in all planes (MIP maps) are better than other MRI sequences, as well as mammography and ultrasound, in demonstrating extent of local tumor, and whether this difference influences surgical management.

Methods: In a 9-month period, 27 patients with biopsy-proven breast carcinoma were evaluated by mammography, ultrasonography, and postbiopsy MRI. Dedicated breast imager interpreted MRI images of the breast tumor, as well mammography and ultrasound, and compared different modalities for demonstration of local extent of disease.

Results: Mean patient age was 57 years. Seven patients had DCIS. Twenty patients had invasive carcinoma (ductal, lobular, or tubular). Mean tumor size was 1.42 cm. Nineteen of the 27 patients had segmental nodules and microcalcifications or focal masses. In 16 of these 19, MIP maps were superior to other MRI sequences in assessing extent of local disease, specifically: (1) main tumor mass 3D size and configuration (8/16); (2) relation of satellite lesions to main tumor (7/16); and (3) proximity to chest wall and skin (5/16). The remaining 3 of 19 had minimal MRI findings. Eight of 27 patients had microcalcifications only: MIP maps changed surgical management in 3; 2 had calcifications with little MRI enhancement; and the remaining 3 had no MRI findings.

Conclusion: MIP maps are superior to other MRI sequences, and in many cases, to mammography and ultrasound, in showing local extent of breast tumor in ways that help the surgeons optimize strategies for local resection and improve patient management.
Patient Satisfaction and Quality of Life After MammoSite Breast Brachytherapy

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**Purpose:** To explore factors influencing pretreatment decision making and report parameters related to on-treatment and posttreatment patient satisfaction and quality of life of patients who complete MammoSite breast brachytherapy (MBT).

**Methods:** A 15-item coded, anonymous questionnaire was mailed to 117 patients who had completed MBT with ≥6 months of follow-up. The survey consisted of 3 sets of 5 questions each directed to address treatment decision making, experience on-therapy, and experience after treatment.

**Results:** A total of 52 patients completed the survey. The median age of the cohort was 64 years and the median follow-up time was 30 months. In making their treatment decision, only a small minority of women (5.8%) viewed the avoidance of mastectomy as “not important.” If MBT were not available, 55.8% of women said they would opt for traditional whole-breast radiotherapy with no difficulty, 28.8% would have significant travel or financial difficulty, 7.7% would refuse radiotherapy, and 7.7% would opt for mastectomy. The most important factor for most patients (44.2%) was that MBT was “focused therapy”; others cited convenience (36.5%), “cutting edge” (17.3%), or read/heard positive feedback (1.9%). Most patients (61.5%) were not concerned that MBT involved a second surgical procedure and the majority (90.4%) were not or only somewhat concerned about the risk of infection. During the course of treatment, the majority of patients reported no pain/discomfort with the MBT catheter (73.1%), no difficulty with the dressing or wound site (73.1%), no pain during removal of the MBT catheter (51.9%), and no breast pain in the immediate posttreatment period (71.2%). Nearly all patients (98.1%) rated their overall on-treatment experience as good/excellent. With regard to experience after therapy, most women reported that they had no or minor side effects (90.4%), had a good/excellent cosmetic outcome (92.3%), would be very/extremely likely to choose MBT again (98.1%), and would recommend MBT to a friend or family member (100%).

**Conclusions:** Patient satisfaction and quality of life both during and after MBT therapy has been extremely high. More data is required from ongoing randomized trials to accurately compare these outcomes with those from traditional whole-breast radiotherapy.
Breast Reconstruction in Women Under 30: A 10-Year Experience

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Current literature offers little commentary on the reconstructive decision-making process for very young women. In this study we aimed to identify which reconstructive techniques were used in a young female population and reasons for their decisions.

Methods: In this retrospective study, the charts of women 30 years old or younger who underwent breast reconstruction at a major cancer center were reviewed. Information on diagnosis, reconstructive choice, reason for choice, and decision for contralateral prophylactic mastectomy (CPM) were reviewed.

Results: Over a 10-year period, from 1997 to 2007, 54 patients 30 years or younger underwent 77 breast reconstructions (unilateral = 31; bilateral = 23). Twenty-three patients underwent autologous reconstruction using some type of free transverse rectus abdominus myocutaneous (TRAM) flap (29 flaps); 3 patients underwent pedicle TRAM reconstruction (3 flaps); 7 patients underwent latissimus dorsi (LD) with implant reconstruction (10 flaps); and 22 patients underwent 34 tissue expander (TE) reconstructions. Seventy-seven percent of the patients who underwent TE reconstruction were initially interested in autologous reconstruction but were deemed too thin to be appropriate candidates for TRAM flap. The majority of patients who underwent LD/implant reconstruction wanted autologous reconstruction but were too thin for a TRAM procedure and were not interested in multiple expansions involved with TE.

Discussion: Considering the excellent health of these young women, the authors were surprised by the high percentage of TE placement rather than autologous reconstruction using the abdomen. One of the reasons may be that very young patients do not have the amount of abdominal adipose and skin redundancy usually found in older women who are often candidates for the procedure. In addition the rate of patients who chose CPM with bilateral reconstruction (42%) is significantly higher than the national average (8%).

Conclusion: Very young women who undergo breast reconstruction seem to be more likely to have CPM and bilateral reconstruction. In this population the amount of tissue available for autologous reconstruction seems to be more limited than in older patients. For these reasons, young healthy women who are otherwise ideal candidates for free tissue transfer undergo significantly more tissue expander reconstruction than expected.
False-Negative Rate of Sentinel Lymph Node Identification in Multicentric and Multifocal Breast Cancers May Be Higher in Advanced Cancer Stages

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Background: Sentinel lymph node biopsy (SLNB) is used in patients with node-negative, unifocal invasive breast cancers (BC) with acceptable accuracy compared with axillary lymph node dissection (ALND). The feasibility of SLNB in multicentric (MC) and multifocal (MF) BC remains unclear. We aimed to evaluate the rate of SLN identification in patients with MC or MF BC across varying cancer stages.

Methods: In this prospective study, 23 women with MC or MF BC underwent SLNB and completion ALND at our institution from April 2002 to February 2006. Presence of axillary (AX) metastases at initial diagnosis (DX) was documented by ultrasound and confirmed by FNA. All patients, regardless of nodal status, were entered on the protocol. All patients underwent subareolar (SA) injection of technetium-99m labeled sulfur colloid prior to incision and a hand-held gamma counter was used to identify the SLN. All patients then underwent completion ALND and the false-negative (FN) rate of SLN identification was examined based on permanent pathologic results.

Results: The study population included 23 women (mean age, 53 years) with T1 through T4, N0 through N3 invasive ductal carcinomas. Twenty women had MC and 3 had MF BC, and 11 had AX metastases at initial DX. Seven patients received neoadjuvant chemotherapy and 7 had previous ipsilateral breast surgery; 3 underwent both. All 23 women had preoperative SLN identification with a gamma counter after SA isotope injection, and all underwent SLNB with subsequent ALND. A mean of 3.5 LNs were removed at SLNB (range, 1-10) and 19.5 upon ALND (range, 6-29). Six patients (26%) had positive AX LNs on completion ALND, yet SLNB detected only 4 of these cases. The FN rate of SLNB for detecting positive AX LNs was 33.3% (95% CI, .0433, .7772). Of the cases that had FN SLNB, both had MC disease and cytologically confirmed nodal involvement at DX with T2N1 and T2N3 BC, respectively. One patient had received neoadjuvant chemotherapy, while the other underwent previous breast surgery.

Conclusion: SLNB using SA injection for patients with MC and MF BC is feasible. However, SLNB may be associated with a higher FN rate in patients with MC BC with AX metastases upon initial DX. Further studies are warranted on this patient subset.
The Incidence of Occult Malignancy and Atypical Histopathology in Prophylactic Mastectomy Specimens After Uninformative BRCA Testing

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Background: Women who carry BRCA 1 or BRCA 2 (BRCA 1/2) mutations may choose to undergo bilateral or contralateral prophylactic mastectomy to reduce the risk of developing breast cancer. In women with breast cancer whose BRCA testing is uninformative (a deleterious mutation is not detectable), the decision to have a contralateral prophylactic mastectomy is difficult because the risk of a second malignancy is not known.

Methods: We retrospectively studied 119 women with at least 10% prior probability of carrying a BRCA 1/2 mutation who were enrolled in a Familial Cancer Registry between 1998 and 2007. Seventy-four women with a BRCA mutation (Group 1) and 45 with uninformative genetic testing (Group 2) underwent bilateral or contralateral prophylactic mastectomy. Patient demographics and the pathology reports from mastectomy specimens were reviewed.

Results: Ninety-five mastectomy specimens from 74 women with BRCA 1/2 mutations were compared to 45 mastectomy specimens from 45 patients with uninformative BRCA testing. The mean ages of the BRCA positive and uninformative patients at prophylactic mastectomy were 42.4 years (range, 27-67 years) and 43.7 years (27-68 years), respectively. Thirty women in Group 1 (40.5%) and 12 women in Group 2 (26.7%) were Jewish (P = 0.12). Atypical histopathology, including atypical ductal and lobular hyperplasia and lobular carcinoma in situ, was noted in 12 (12.6%) of 95 specimens in Group 1 and 12 (26.7%) of 45 in Group 2 (P = 0.04). Seven (7.4%) of 95 specimens in BRCA 1/2 positive patients were noted to have malignancy on final pathology as compared to 5 (11.1%) of 45 in women with uninformative testing (P > 0.20). Similarly, 6 (8.1%) of 74 and 5 (11.1%) of 45 patients had occult malignancies present in Groups 1 and 2, respectively (P > 0.20). Of the malignant pathologies, 4 (57.1%) of 7 were invasive in Group 1, in comparison to 2 (40%) of 5 in Group 2.

Conclusions: This study highlights the importance of counseling women with positive or uninformative BRCA testing of their risks of atypical histopathology and/or occult malignancy when considering surgical options. It is important to note that the higher rate of atypical histopathology in women with uninformative results may be due to selection bias since this population of women all had contralateral known malignancies.
Treatment and Outcomes of Patients With Primary Breast Sarcoma

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Introduction: Primary breast sarcoma is a rare form of breast malignancy that presents a therapeutic dilemma due to limited outcome data. Surgical resection remains the primary treatment; the role of adjuvant therapy is less clear. The aim of this study was to further characterize this disease and to determine factors associated with use of adjuvant therapy.

Methods: Pathologically diagnosed primary breast sarcomas from 1986-2006 were retrospectively reviewed. Data collected included demographics, tumor data, surgery details, use of radiation or chemotherapy, and recurrence data. Follow-up was obtained from patient records and death certificates. Overall survival (OS) was estimated using Kaplan-Meier methods. Relationships between patient variables and OS were determined using univariate Cox proportional hazards models.

Results: Thirteen patients with primary breast sarcoma were identified, ranging from 32 to 72 years (mean, 50). Diagnoses were leiomyosarcoma (3), malignant fibrous histiocytoma (3), fibrosarcoma (3), carcinosarcoma (1), angiosarcoma (1), epithelioid cell sarcoma (1), and rhabdomyosarcoma (1). Surgical treatment consisted of mastectomy in 10 patients (77%) and partial mastectomy in 3 (23%). All margins of resection were negative. Six patients underwent axillary staging; none were positive. Patients with tumors >5 cm were more likely to undergo postoperative radiation therapy ($P < 0.05$). Five patients received chemotherapy for metastatic disease. Mean follow-up was 6.1 years. Local recurrence occurred in 7 patients (54%), ranging from 4 to 41 months (mean, 20). Metastatic disease was present in 2 patients (15%) at diagnosis and both died from their disease. Six patients (46%) developed metastatic disease during follow-up and died from their disease. Five patients (39%) remained disease-free. Five-year OS was 58%. Five-year OS was 84% for tumors <5 cm and 39% for tumors >5 cm. Tumor size was the only variable significantly associated with OS (RR = 1.1 per 1-cm increase in size >5 cm; $P < 0.05$).

Discussion: Treatment for primary breast sarcomas is wide excision to clear margins. Axillary lymph node assessment is not necessary for the treatment of these tumors. Tumor size >5 cm is significantly associated with the use of adjuvant radiation. Tumor size >5 cm is the only significant prognostic indicator of overall survival.
A Novel Ultrasound-Guided Electrosurgical Loop Device for Intraoperative Excision of Breast Lesions: An Improvement in Surgical Technique

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Introduction: The rate of involved lumpectomy margins using standard surgical techniques has ranged from approximately 20 to 45%. The use of intraoperative ultrasound in the localization and excision of breast lesions has been demonstrated to provide significant improvement in the rate of involved margins. We report our collective experience utilizing a flexible loop electrosurgical device (Phantom) under ultrasound guidance for the intraoperative excision of breast lesions.

Methods: Four centers contributed their clinical experience over 6 sequential months with the Phantom device (Rubicor Medical, Inc., Redwood City, CA) to excise 79 breast lesions. Ultrasound was used intraoperatively to localize and guide real-time excision of the lesions. Pathology reports were retrospectively reviewed for diagnosis and final margin status. Case data were assessed for rate of re-excision, size and volume of excised specimen, incision size, and time to specimen extraction and surgical incision closure.

Results: The collective cases had the following average metrics:

<table>
<thead>
<tr>
<th>Case Metric</th>
<th>79 Cases</th>
<th>59 Malignant</th>
<th>20 Benign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average lesion size U/S (cm)</td>
<td>1.6 x 1.5 x 1.3</td>
<td>1.5 x 1.5 x 1.3</td>
<td>1.9 x 1.4 x 1.2</td>
</tr>
<tr>
<td>Average size of excised specimen (cm)</td>
<td>3.7 x 2.8 x 2.0</td>
<td>3.8 x 2.8 x 2.0</td>
<td>3.6 x 2.7 x 2.0</td>
</tr>
<tr>
<td>Average specimen volume (cm³ - calculated)</td>
<td>20.7</td>
<td>21.3</td>
<td>18.8</td>
</tr>
<tr>
<td>Average incision size for specimen removal (cm)</td>
<td>3.5</td>
<td>3.6</td>
<td>3.2</td>
</tr>
<tr>
<td>Time to specimen extraction (min)</td>
<td>7.9</td>
<td>8.0</td>
<td>7.6</td>
</tr>
<tr>
<td>Time to surgical closure (min)</td>
<td>26.2</td>
<td>26.4</td>
<td>25.7</td>
</tr>
</tbody>
</table>

Fifty-nine of 79 lesions were demonstrated to be malignant; of these, 51 cases (86.4%) had noninvolved final margins with an average specimen size of 21.3 cm³.

Conclusions: These results demonstrate the effectiveness of the Phantom flexible loop electrosurgical device for real-time, ultrasound-guided lumpectomy. The device offers the benefits of improved efficiency, improved cosmetic results (with decrease in volume of excision and smaller incision size), and very low need for reoperation secondary to involved margins.
Invasive Local Recurrence Increased After Radiation Therapy for DCIS

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Introduction: It is widely thought that local recurrences after conservative treatment for DCIS are equally distributed between invasive and noninvasive (DCIS) recurrences. We analyzed our data to see if this was true.

Methods: A prospective database consisting of 878 conservatively treated patients with DCIS was analyzed.

Results: Among 551 excision-only patients, there were 88 recurrences, 31 of which were invasive (35%). Among 327 excision-plus radiation therapy patients, there were 59 recurrences, 31 (53%) of which were invasive. We looked at 26 factors (nuclear grade, size, margin width, etc) in an attempt to predict which patients would develop an invasive recurrence. A prolonged time to recurrence was the only statistically significant factor.

<table>
<thead>
<tr>
<th></th>
<th>Excision Alone</th>
<th>Excision + RT</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 551</td>
<td>N = 327</td>
<td></td>
</tr>
<tr>
<td>Percent Invasive Recurrences</td>
<td>35%</td>
<td>53%</td>
<td>0.04</td>
</tr>
<tr>
<td>Percent DCIS Recurrences</td>
<td>65%</td>
<td>47%</td>
<td>0.04</td>
</tr>
<tr>
<td>At/Near Primary</td>
<td>92%</td>
<td>80%</td>
<td>0.03</td>
</tr>
<tr>
<td>Median Time to Recurrence</td>
<td>23 mo</td>
<td>58 mo</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Discussion: The median time to local recurrence for irradiated patients was more than twice as long when compared with nonirradiated patients. During this prolonged time period, there is more time for a local recurrence to progress to invasion. Irradiated patients had more breast scarring, making diagnosis by palpation and mammography more difficult. Irradiated patients recur with an invasive recurrence at a statistically higher rate than nonirradiated patients. Follow-up with MRI should be considered.
False-Negative Sentinel Lymph Nodes in Breast Cancer: A 10-Year Experience
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Introduction: The false-negative rate of sentinel node biopsy (SNB) for breast cancer remains unknown, with recent reports describing rates as high as 12-16%. This can have significant clinical impact, as downstaging these patients may result in underuse of appropriate adjuvant therapy. We present our institutional experience in an effort to address this concern.

Methods: We searched our database from 1997-2007 for cases of breast cancer for which sentinel lymph node biopsy was performed. We analyzed all negative sentinel node cases in which metastatic disease was present in nonsentinel axillary lymph nodes. The sentinel nodes were identified intraoperatively utilizing both radioactive tracer and blue dye. All sentinel nodes were subjected to 3 levels and staining by hematoxylin and eosin. Immunohistochemical staining for cytokeratin was also performed. Nonsentinel lymph nodes were analyzed for metastasis by a single hematoxylin and eosin slide. The primary breast tumor was analyzed for grade, tumor size, and lymphovascular invasion (LVI).

Results: Among 1993 sentinel node procedures, 348 had micrometastatic or macrometastatic disease. Among the negative SNB cases, 18 patients had (+) nonsentinel nodes (Table 1).

Discussion: At variance with recent reports, we describe a 1.1% incidence of false-negative SNB. These were more frequent early in our experience, reflecting improvements in technique. Our results indicate that the SNB technique is highly reliable in detecting nodal metastases when performed by a dedicated breast oncology surgery and pathology team.

Table 1

<table>
<thead>
<tr>
<th>Year of Surgery</th>
<th># of Patients With False (-) SNB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997-1999</td>
<td>11</td>
</tr>
<tr>
<td>2000-2004</td>
<td>4</td>
</tr>
<tr>
<td>2005-2007</td>
<td>3</td>
</tr>
</tbody>
</table>
Impact of Neoadjuvant Chemotherapy Response in Breast Cancer and Resultant Effect on Surgical Recommendation

Kelly Huynh, David Hsiang, Karen Lane, John Butler, Lydia Su

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Introduction: Neoadjuvant chemotherapy (NAC) is commonly used to downstage breast cancers and to facilitate breast conservation surgery. In this study, we analyzed the determining factors for recommendation of mastectomy versus conservation surgery based on MR imaging findings before and after NAC and then analyzed the impact of final pathologic response on change of recommendations.

Methods: Seventy-four breast cancer patients undergoing NAC were analyzed. Every patient received a pretreatment MRI scan, then 3 to 4 follow-up scans during the course of NAC. Two experienced breast surgeons reviewed all cases. An initial surgical recommendation was made based on the pretreatment findings. Then the post-NAC MRI images were reviewed, and a new surgical recommendation was recorded. Finally, the pathological results were disclosed and the surgeons were asked whether a lesser surgical procedure would have been possible.

Results: Consensus recommendations for pre-NAC were for 48 mastectomies, 22 lumpectomies, and 4 discordant recommendations. The mean tumor size was 4.4 ± 2.7 cm in the mastectomy group; and 2.5 ± 1.4 cm in the lumpectomy group ($P = 0.0005$). Consensus recommendations post-NAC were for 22 mastectomies, 46 lumpectomies, and 6 discordant recommendations. The original mastectomy candidates who were changed to lumpectomy had a smaller pretreatment size, 3.6 ± 1.9 cm ($P = 0.02$), and a greater reduction in tumor volume, 88% ± 22%, when compared to the persistent mastectomy patients ($P = 0.03$). When the final path report was disclosed, both surgeons agreed to convert 5 additional mastectomy patients to lumpectomies.

Discussion: The results indicated pretreatment tumor size was the major determinant for mastectomy. This was still evident in the posttreatment recommendations, even when MRI showed evidence of minimal/no residual disease following NAC. With disclosure of final pathology, the surgical recommendations more closely tracked MRI interpretation of clinical response. The reason for this discrepancy may be due to lack of confidence in the accuracy of MRI interpretations, such as sensitivity to occult residual disease.
Using National Breast Cancer Indicators to Measure Quality of Care for Patients in a Comprehensive Breast Center Serving a Predominantly African American Patient Population

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Introduction: In April 2007, the National Quality Forum (NQF) endorsed the first nationally recognized hospital-based performance measures for quality of care for breast cancer. These include but were not limited to (1) consideration or administration of chemotherapy within 4 months of diagnosis for women under age 70 with hormone receptor–negative breast cancer and (2) administration of radiation therapy within 1 year of diagnosis for women under age 70 receiving breast-conserving surgery (BCS). The aim of this study was to use these indicators to measure quality of care at our CBC.

Methods: We performed a retrospective review of the tumor registry and medical records for the patient populations representing the quality indicators (QIs) above for 2005-2006.

Results: For patients diagnosed with hormone receptor–negative breast cancer, 22 (75.9%) of 29 and 28 (87.5%) of 32 were considered for or received chemotherapy in 2005 and 2006, respectively. However, of those patients, 21 (72.4%) of 29 and 24 (75.0%) of 32 were considered for or received chemotherapy within the 4-month period set forth by the NQF indicator. For patients undergoing BCS, 20 (86.9%) of 23 in 2005 and 37 (94.9%) of 39 in 2006 were referred for adjuvant radiation therapy. The proportion who received radiation therapy within 1 year of diagnosis as recommended by the NQF were 18 (78.2%) of 23 and 29 (74.4%) of 39 for diagnosis years 2005 and 2006, respectively.

Discussion: The vast majority of patients in our CBC are considered for and referred to medical and/or radiation oncology for adjunctive therapy and about three fourths receive treatment compliant with the NQF QIs. Our compliance exceeds historically reported data (diagnosis years 2000-2001) for our region. The QIs are based on high-level evidence that compliance improves outcome. To increase our compliance rate, we are developing methods to improve integration of and access to the multiple disciplines in our CBC. Using the NQF indicators not only serves to assess hospital performance at a systems level but is also a useful method of tracking cancer quality of care.
Do Additional Shaved Margins at the Time of Lumpectomy Eliminate the Need for Re-excision?

Allyson Jacobson, Susan Boolbol, Michael Osborne, Sheldon Feldman

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Introduction: The majority of women diagnosed with breast cancer will undergo breast conservation surgery. Re-excision rates to obtain negative margins have been reported in some studies to be greater than 50%. The purpose of our study is to determine if removing additional shaved margins from the lumpectomy cavity at the time of the original surgery reduces the need to return to the operating room for a re-excision.

Methods: A retrospective study was performed on 125 women with breast cancer who had undergone partial mastectomy with additional shaved margins taken from the lumpectomy cavity at the original surgery. The pathology reports were analyzed with regard to margin status before and after shaved margins were taken, as well as volume of tissue removed with the specimen and additional margins.

Results: Of 125 patients, even when additional shaved margins were taken at the initial surgery, 24 (19%) required re-excision. Had we not taken additional margins, 84 patients (67%) would have required re-excision. This demonstrates that the need for re-excision was eliminated in 60 patients (48%). In 41 patients (33%), the initial lumpectomy specimens had negative margins and additional shaved margins were noncontributory. Nine patients ultimately required mastectomy to achieve negative margins. The median volume of the lumpectomy specimens was 44 cm³. The median volume of additional margins was 24 cm³; this represents an additional 54% of tissue removed.

<table>
<thead>
<tr>
<th>First surgery (125 pts)</th>
<th>neg PM margins</th>
<th>pos PM margins</th>
<th>pos PM margins</th>
</tr>
</thead>
<tbody>
<tr>
<td>neg shaved margins</td>
<td>41 (33%)</td>
<td>60 (48%)</td>
<td>24 (19%)</td>
</tr>
</tbody>
</table>

Conclusions: Excising additional shaved margins at the original surgery reduced the need to return to the operating room in 48% of cases. There is a balance, however, to removing more tissue for additional margins and still having a desirable cosmetic outcome following breast conservation surgery. The decision to take extra margins should be based on the surgeon’s judgment.
How Accurately Can Clinicians Predict the Oncotype DX Recurrence Score?

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Beth Israel Medical Center, New York, NY, United States

Introduction: The Oncotype DX recurrence score (RS) predicts risk of disease recurrence at 10 years as well as assesses the benefit of chemotherapy. The purpose of this study was to determine how well breast surgeons, medical oncologists, and breast surgical and hematology oncology fellows can predict the RS that correlated with the actual score determined by the genomic assay.

Methods: A retrospective study was performed using data on 30 women with estrogen receptor–positive, lymph node–negative breast cancer, who had an RS calculated. The clinicians were given the patient’s age and tumor histology, including TNM stage, grade, and presence of lymphovascular invasion. The clinicians were required to predict the RS divided into low range: 0-17; intermediate range: 18-30; or high: >31. The actual RS was compared with the RS predictions of 2 medical oncologists, 3 breast surgeons, 1 hematology oncology fellow, and 2 breast surgery fellows.

Results: The RS predicted by the clinicians poorly correlated with the actual RS for most patients analyzed. The average for all clinicians was 15 (50%) correct.

<table>
<thead>
<tr>
<th></th>
<th>Medical Oncologists</th>
<th>Breast Surgeons</th>
<th>Hem Onc Fellow</th>
<th>Breast Fellows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%) correct</td>
<td>20 (67%)</td>
<td>12 (40%)</td>
<td>18 (60%)</td>
<td>16 (53%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 (53%)</td>
<td>15 (50%)</td>
<td>12 (40%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16 (53%)</td>
<td>11 (37%)</td>
</tr>
</tbody>
</table>

Conclusion: In clinical practice, the decision to order the Oncotype DX assay is made by surgeons and medical oncologists. In the past, some patients were either overtreated or undertreated with chemotherapy since the treatment decisions were based on clinical and histologic criteria only. For approximately 50% of our patients, the Oncotype DX recurrence score provided additional information beyond the usual clinical assessment that could be used to better predict risk of disease recurrence.
Method of Breast Cancer Presentation and Depressed Mood in Women With Locally Advanced Disease

Elizabeth Jagodinski, Donna Jeffe, Julie Margenthaler, Rebecca Aft

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Introduction: Women diagnosed with breast cancer through imaging or by palpation of a mass may have very different psychological experiences and responses to their diagnosis. We examined the relationships between the method of presentation and the severity of depressed mood and perceived risk of recurrence.

Methods: One hundred twenty women with clinical stage II/III breast cancer enrolled in a single-arm, phase 2 clinical trial were interviewed at the time of diagnosis and at 1 year. The method of presentation was determined by review of medical records. Method of presentation leading to diagnosis was defined as asymptomatic by screening mammogram or symptomatic by palpable mass. Severity of depressed mood (before treatment and 1-year follow-up) and perceived risk of recurrence (at follow-up) were determined at each interview and differences tested in these outcomes by method of presentation.

Results: Of the 120 women in the clinical trial, 86 completed both interviews. Eleven were diagnosed by screening mammogram (mean age, 50.8 years; 82% white; 18% black; avg. tumor size, 2.6cm), and 75 were diagnosed by palpable mass (mean age, 48.7 years, 73% white; 27% black; avg. tumor size, 3.4 cm). Perceived risk of recurrence at 1-year follow-up did not differ significantly between the 2 methods of presentation (P = .68). Using repeated-measures analysis of the variance, there was a significant interaction between method of presentation and depressed mood over time, with the palpable mass group experiencing a decrease in depressed mood over time and the screening mammography group experiencing an increased depressed mood over time (P = .041). This interaction held in the repeated-measures model controlling for perceived risk of recurrence, availability of social support and age (P = .042).

Conclusions: Despite the small number of patients in the study, our results suggest that women diagnosed with stage II/III breast cancer by screening mammography may be more susceptible to depressed mood a year after diagnosis and could benefit from early intervention to prevent a posttreatment increase in depressed mood.
Management of Nipple Discharge: Technology Chasing Application
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Introduction: Work-up of nipple discharge is controversial. There is no consensus on diagnostic approach.

Methods: A retrospective study of all patients presenting to our breast center with nipple discharge between January 2004 and July 2006. Demographic data, work-up, microdochectomy, pathology, and follow-up were analyzed. A positive diagnostic test was defined as identification of a proliferative lesion on pathology. A negative test was defined as either a nonproliferative lesion on pathology or complete resolution of symptoms with normal screening exam and mammogram at 1-year follow-up.

Results: A total of 1708 new patients were seen; 122 (7.1%) of whom had nipple discharge. The median (25th-75th centile) age was 46 (56-40) years; M:F = 121:1. Fifteen (12.3%) patients had an associated lump on exam. The median (25th-75th centile) follow-up was 57 (48-80) weeks. Nineteen patients with less than 52 weeks of follow-up were excluded from analysis of accuracy. Forty (38.8%) patients with surgically significant nipple discharge by history and exam alone (true, spontaneous, uniductal, serous/sanguinous, and persistent) were subjected to microdochectomy--26 (65%) had a proliferative lesion on pathology [19 (47.5%) = papilloma, 3 (7.5%) = atypical ductal hyperplasia, 4 (10%) = cancer]. Compared with other diagnostic modalities, clinical assessment was most accurate in predicting the presence of a proliferative lesion (table).

Discussion: Clinical assessment and microdochectomy based on history and exam alone is the most accurate predictor of a proliferative lesion in the breast. Other modalities do not improve the diagnostic accuracy.

Table 1. Comparison of Diagnostic Modalities

<table>
<thead>
<tr>
<th>Test</th>
<th>Number</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>+PV</th>
<th>-PV</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography</td>
<td>98</td>
<td>37.50</td>
<td>74.44</td>
<td>11.54</td>
<td>93.06</td>
<td>0.4339</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>73</td>
<td>50.00</td>
<td>79.66</td>
<td>36.84</td>
<td>87.04</td>
<td>0.0391</td>
</tr>
<tr>
<td>Ductogram</td>
<td>18</td>
<td>33.33</td>
<td>46.67</td>
<td>11.11</td>
<td>77.78</td>
<td>1.0000</td>
</tr>
<tr>
<td>MRI</td>
<td>26</td>
<td>55.56</td>
<td>64.71</td>
<td>45.45</td>
<td>73.33</td>
<td>0.4185</td>
</tr>
<tr>
<td>Cytology</td>
<td>18</td>
<td>80.00</td>
<td>53.85</td>
<td>40.00</td>
<td>87.50</td>
<td>0.3137</td>
</tr>
<tr>
<td>Clinical assess.</td>
<td>103</td>
<td>100.00</td>
<td>81.82</td>
<td>65.00</td>
<td>100</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
Outcomes of Multiple-Wire Localization Lumpectomy for Larger Breast Cancers: Do Multiple Wires Translate Into Increased Imaging, Biopsies, and Recurrences?

Sara H. Javid, Laurie J. Kirstein, Elizabeth Rafferty, Stuart Lipsitz, Richard Moore, Jennifer E. Rusby, Colleen D. Murphy, Kevin S. Hughes, Michelle C. Specht, Alphonse Taghian, Barbara L. Smith

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Introduction: We previously reported that breast conservation is possible in the majority of breast cancer patients whose mammographic lesions are large enough to require multiple localizing wires for excision. We now wished to determine whether rates of local recurrence were higher in patients requiring multiple-wire localization versus single-wire localization for lumpectomy. We also sought to determine whether an increased number of follow-up imaging studies and biopsies were performed in multiple-wire patients.

Methods: A retrospective review of 150 patients who underwent multiple-wire lumpectomy and 185 controls who underwent single-wire lumpectomy for breast cancer was performed. Rates of in-breast tumor recurrence, metastasis, and additional ipsilateral imaging and biopsy procedures were calculated. Imaging or biopsy was considered additional if indicated for palpable or radiographic findings or if prompted by MD or patient concern about the treated breast. Screening mammography, screening MRI, or imaging obtained as part of another research protocol were not considered additional.

Results: Median follow-up was 17.1 months (range, 0-75.6) following initial lumpectomy, and did not differ between groups ($P = 0.19$). One multiple-wire patient (0.9%) and 2 single-wire patients (1.3%) developed in-breast recurrences ($P = 0.84$) at 12.1, 22.1, and 51.4 months, respectively, after initial excision. All 3 local recurrences were treated with mastectomy and remain alive at 44.7, 55.7, and 68.7 months, respectively, after initial excision. Three had undergone multiple-wire lumpectomy; all had required mastectomy during primary treatment. Three had undergone single-wire lumpectomy; one required mastectomy during primary treatment. Additional follow-up imaging was obtained in 28.6% of multiple-wire cases and 22.5% of single-wire cases ($P = 0.1$). Eighteen cases underwent biopsy: 7 (6.2%) of the multiple-wire cases and 11 (6.9%) of the single-wire cases ($P = 0.94$).

Discussion: We found no increased risk of local recurrence or of additional imaging or biopsy procedures following breast conservation in patients whose lesions were large enough to require multiple localizing wires for excision. Breast conservation should be considered a safe alternative to mastectomy even for patients with mammographically extensive lesions.
Long-Term Follow-up of the First Prospective Trial Treating DCIS Patients With Excision Alone

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¹University of Southern California, Los Angeles, CA, United States, ²Breast Cancer Consultation Service, Tiburon, CA, United States

Introduction: In 1973, the standard treatment for patients with ductal carcinoma in situ (DCIS) was total mastectomy and axillary lymph node dissection. In that year, we began a prospective registration trial treating DCIS patients with excision alone. The criteria for entry into the trial were nonpalpable mammographically detected DCIS, 25 mm or smaller, with margins of 1 mm or more and no residual calcifications on postexcision mammography.

Methods: The following data were collected prospectively: nuclear grade, margin width, the presence or absence of comedonecrosis, tumor extent (size), local recurrence (invasive and/or DCIS), death from breast cancer, and death from other causes. Recurrence-free survival, overall survival, and breast cancer–specific survival were estimated using the Kaplan-Meier method.

Results: Average follow-up was 147 months (12.3 years). The local recurrence rate for low- and intermediate-grade lesions at 20 years was 9%, for high-grade lesions it was 62% (P < 0.001). For low- and intermediate-grade lesions, without comedonecrosis and with margins of 3 mm or more, the 20-year recurrence rate was only 3%.

Discussion: Low- and intermediate-grade lesions and those without comedonecrosis who meet the criteria detailed above can be safely treated with excision alone. When a combination of favorable factors is used, the recurrence rate becomes even lower (3%). DCIS patients with favorable characteristics can be treated with excision alone. Failure to select the subgroup of patients with favorable DCIS may result in overtreatment in 97% of patients.
Utility of Sentinel Lymph Node Mapping in Breast Cancer Patients With a History of Ipsilateral Axillary Dissections

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H. Lee Moffitt Cancer Center & Research Center, University of South Florida, Tampa, FL, United States

Background: Patients who have previously undergone a completion axillary lymph node dissection (CALND) may develop an ipsilateral breast cancer recurrence or a second primary breast cancer. Historically, these patients did not receive any lymph node assessment. We investigated breast cancer patients who have previously undergone CALND to determine the utility of sentinel lymph node (SLN) biopsy at a later date.

Methods: The database of the comprehensive breast program at H. Lee Moffitt Cancer Center was searched for patients that have a history of a CALND that underwent a subsequent, ipsilateral SLN biopsy at a later date. We identified 46 patients that fulfilled this requirement. A chart review was performed on these 46 patients.

Results: SLN were successfully mapped in 12 (26%) of 46 patients. Of patients that successfully mapped, 8 (66%) of 12 mapped to the ipsilateral axilla, 1 (8%) of 12 mapped to contralateral axilla, and 3 (25%) of 12 mapped to internal mammary nodes. Two (16%) of 12 had a positive sentinel lymph node (1 had metastatic disease in the contralateral axilla). Average time interval between CALND and attempted SLN biopsy was 8.7 years. Average follow-up for all patients has been 21.6 months with no evidence of local recurrence. Of the patients successfully mapped, there has been 1 death due to metastatic breast cancer and this patient had a positive SLN.

Conclusions: Reoperative SLN biopsy is a feasible option in patients who have undergone previous CALND and subsequently develop a recurrence or new ipsilateral primary breast cancer. Reoperative SLN biopsy identifies alternative pathways for the breast cancer metastases and aids the clinician in staging and local control.
Use of Neoadjuvant Chemotherapy Prior to Resection of the Primary Tumor in Stage IV Breast Cancer May Predict for Improved Survival

Julie Lang\textsuperscript{2}, Welela Tereffe\textsuperscript{1}, Roshni Rao\textsuperscript{1}, Lei Feng\textsuperscript{1}, Funda Meric-Bernstam\textsuperscript{1}, Isabelle Bedrosian\textsuperscript{1}, Henry Kuerer\textsuperscript{1}, Eva Singleterry\textsuperscript{1}, Kelly Hunt\textsuperscript{1}, Gabriel Hortobagyi\textsuperscript{1}, Gildy Babiera\textsuperscript{1}

\textsuperscript{1}MD Anderson Cancer Center, Houston, TX, United States, \textsuperscript{2}University of Arizona Cancer Center, Tucson, AZ, United States

Introduction: Limited data exists regarding optimal therapy for patients who present with stage IV breast cancer with an intact primary tumor. We recently reported an update of our institutional series that demonstrated improved overall survival (OS) and progression-free survival (PFS) for patients who underwent resection of the intact primary tumor compared to the nonsurgical group. We hypothesized that neoadjuvant chemotherapy (NC) would improve OS and PFS by improving patient selection for surgery. We also hypothesized that the response of the primary tumor to NC would increase the probability of achieving no evidence of disease (NED) status in the surgical group.

Methods: We reviewed the records of all patients at our institution who presented from 1997-2002 with stage IV disease with an intact primary tumor. OS and PFS were estimated by the Kaplan-Meier method. The log-rank test was used to compare the difference in survival between surgical and nonsurgical patients. Multivariate statistical analysis was performed using the Cox hazards model. We evaluated the relationship between response to NC and likelihood of NED status.

Results: The median follow-up duration from time of presentation to our institution was 58.6 months. Of 220 patients identified with stage IV disease with an intact primary tumor, 85 underwent resection of the primary. Of the 85 surgical patients, 33 received NC. NED status was achieved in 22 surgical patients (25.9%) and 1 nonsurgical patient (0.7%) (\textit{P} < 0.0001). On univariate analysis, NC patients had improved OS (\textit{P} = 0.001) and PFS (\textit{P} = 0.0003) when compared to the surgical patients who did not undergo NC. On multivariate analysis, NC was associated with improved OS (HR = 0.29; 95\% CI, 0.13-0.64; \textit{P} = 0.002) with adjustment for significant covariates. Few patients experienced a pathologic complete response (PCR) (\textit{N} = 3) after NC; PCR was not associated with increased likelihood of NED status (\textit{P} = 0.58), however, there was a trend toward a higher proportion of NED in the patients achieving even a partial response (\textit{N} = 18) (\textit{P} = 0.08).

Discussion: Tumor response after neoadjuvant chemotherapy may be useful in determining appropriate surgical treatment for stage IV patients with an intact breast tumor. The survival advantage demonstrated for the neoadjuvant chemotherapy patients may reflect a selection bias.
Surgical Treatment Options for Women Diagnosed With Breast Cancer After Augmentation

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1Mayo Clinic in Arizona, Phoenix, AZ, United States, 2Georgetown University Hospital, Washington, DC, United States, 3Anne Arundel Medical Center, Annapolis, MD, United States

Introduction: Breast augmentation is the most commonly performed cosmetic procedure in the US, with 329,000 augmentations performed in 2006. As this population ages, the number of previously augmented patients presenting with breast cancer can be expected to rise. This raises the question of what surgical options are appropriate in these patients.

Methods: Retrospective review examines 71 augmented patients with 74 newly diagnosed breast cancers managed with either mastectomy, n = 35, or breast conservation therapy, (BCT), n = 39, from 1995 to 2006.

Results: The average age of the patients was 52 years (range, 34-74 years). Forty-five percent of patients presented with a palpable mass. Lesions were mammographically apparent in only 76.3% of cases and additional imaging was performed in 61% of patients with ultrasound being the most common modality. Type and location of implant did not appear to impact surgical choice. No BCT patient had her implant removed at the time of surgery except 1 who presented with an implant contracture and subsequently underwent implant removal with mastopexy. In those patients undergoing mastectomy, the majority underwent immediate reconstruction (80%) with either implant (86%) or autologous (14%) reconstruction. One patient underwent mastectomy alone without implant removal. Sentinel lymph node (SLN) biopsy was performed in 67% of cases. Average tumor size was 1.65 cm (1.4 cm, BCT group, and 1.9 cm, mastectomy group). Thirty-six percent were lymph node–positive (34% of the SLN group). Overall patients who underwent mastectomy had higher stage disease and presence of multifocality. Local recurrence occurred in 4 patients (5.4%), 3 BCT and 1 mastectomy patient. Two of the BCT patients refused radiation after surgery and 1 BCT patient developed a locoregional recurrence with simultaneous systemic metastases. There have been no regional recurrences in patients who underwent SLN biopsy. Capsular contraction occurred in 11 (28%) of BCT patients with 8 requiring implant exchange.

Discussion: Standard surgical criteria can be used for augmentation patients diagnosed with breast cancer. Both BCT and SLN biopsy can be safely performed in these patients with capsular contracture being the main long-term complication.
Intraoperative Assessment of Sentinel Lymph Nodes in Breast Cancer Patients Using Real-Time RT-PCR: Results of the Cardiff Validation Study

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¹Department of Surgery, School of Medicine, Cardiff University, Cardiff, United Kingdom, ²Department of Pathology, School of Medicine, Cardiff University, Cardiff, United Kingdom

Background: Patients with sentinel lymph node (SLN) metastases will need delayed completion axillary lymph node dissection, if intraoperative assessment is not employed. Intraoperative assessment is not routinely performed in the UK due to poor sensitivity of the available methods and overburdened pathology resources. A real-time PCR assay can be performed in approximately 40 minutes and has high sensitivity and specificity when compared to permanent section H&E histology (H&E). We are conducting a prospective clinical validation study of the GeneSearch™ Breast Lymph Node (BLN) Assay (Veridex, LLC) to confirm its potential usefulness within the UK healthcare system.

Methods: The assay utilizes 50% of the lymph node(s) to detect the presence of cytokeratin-19 and mammaglobin mRNA. Internal and external controls confirm a valid result. The assay has been calibrated to detect metastases > 0.2 mm. Assay results are compared to H&E performed on alternating portions of the node tissue with 3 levels taken from each face of the approximately 2-mm node slabs. The study will continue until at least 15 node-positive patients are enrolled.

Results: Interim results on 48 subjects confirm the excellent performance of the assay. Sensitivity is 100% (6/6) and specificity is 97.6% (40/41). One subject had an inconclusive histological result. Six subjects had positive H&E and positive assay results. Of these, 4 were macrometastases (>2.0 mm), 1 was a micrometastasis (0.2–2.0 mm), and 1 was of undetermined size >0.2 mm. Forty subjects were negative by both the assay and H&E.

Discussion: Intraoperative assessment of the sentinel lymph node can be rapidly and accurately performed using the GeneSearch™ BLN Assay. Our initial results confirm the assay’s high sensitivity and specificity. The assay is being carried out and the results interpreted without difficulty by a trained biomedical scientist in our pathology laboratory within the operating theater complex and do not require an expert histopathologist. The assay allows more thorough node analysis by reducing sampling error and improves intraoperative surgical management of breast cancer patients.
Breast Cancer Presentation and Participation in Screening Mammography
Kellie L. Mathis, Tanya L. Hoskin, Judy C. Boughey, Brian S. Crownhart, Kathy R. Brandt, Celine M. Vachon, Amy C. Degnim

Mayo Clinic, Rochester, MN, United States

Introduction: Approximately 70% of US women over the age of 40 participate in screening mammography (mmg). The aim of this study was to describe the presenting complaint and prior participation in screening mmg in women presenting to our institution for breast cancer surgery in the year 2000.

Methods: All women who underwent definitive surgical resection of an in situ or invasive breast cancer were identified through an institutional surgical database. Patients were excluded if male, history of ipsilateral breast cancer, or stage IV disease. Presentation was coded as palpable if the woman presented with an ipsilateral palpable mass, nipple discharge, nipple retraction, or if a new mass was detected on clinical exam.

Results: The study cohort consisted of 592 women with a median age of 60 years (range, 26-93). Cancer presented as an abnormality on screening mmg in 57% and as a palpable mass in 43%. Patients had at least 1 prior screening mmg in 81%, no prior screening mmg in 8%, and the screening status was unknown in 11%. Patients with no prior screening mmg were significantly more likely to present with a palpable mass than those with any prior mmg (67% vs. 38%, \(P < 0.0001\)). Among patients with prior screening, 74% had a normal mmg within 2 years of the breast cancer surgery, and the median time from prior screening mmg to breast cancer surgery was 1.2 years (range, 0.5 to 13.1). Presentation was considered palpable in 82%, 24%, 30%, 35%, 63%, and 60% of women with their last screening mmg within 11 months, 11-13 months, 13 months to 2 years, 2-5 years, 5-10 years, and >10 years, respectively. Patients with palpable presentation were significantly younger than those with a screen-detected cancer (mean age, 57.5 vs 62.5 years; \(P < 0.0001\)), and women without a prior screening mmg were significantly younger than those with prior screening (mean age, 46.2 vs 61.9 years; \(P < 0.0001\)). Even in the subset of women 40 years and older, where 84% had prior screening mmg, presentation was palpable in 41%.

Conclusions: Despite high participation in screening mmg in this group of breast cancer patients, a sizable proportion of the cancers (43%) presented as a palpable mass or otherwise symptomatic presentation. This suggests that breast examination remains valuable for the detection of breast cancer.
Clinical Assessment of the Axillary Sentinel Lymph Node for Breast Cancer Metastasis by the Surgeon: A Study of One Institution’s Voluntary Policy Change

Juliana Meyer, Sabha Ganai, Robert Goulart, Holly Mason
Baystate Medical Center, Springfield, MA, United States

Introduction: Routine intraoperative touch preparation analysis (R-TPA) provides immediate pathologic examination of the axillary sentinel node but can negatively impact OR efficiency or risk a false-positive or false-negative result. To minimize these effects, our institution developed a voluntary policy for selective use of TPA (S-TPA), thereby limiting TPA only to sentinel lymph nodes (SLN) found clinically suspicious by the surgeon for metastatic disease. The aim of our study was to examine the accuracy of this clinical assessment by the surgeon (CAS).

Methods: We retrospectively reviewed data from 330 patients who underwent axillary SLN biopsy with and without intraoperative TPA for a diagnosis of breast cancer from July 2002 until June 2005 at a single institution. Comparisons were made between routine (n = 147) and selective (n = 183) use of TPA before and after the policy change in January 2004 using chi-square analysis. All surgeons at our institution, both breast-dedicated surgeons and community surgeons, were included. The method of sentinel node identification (blue dye vs lymphoscintigraphy or both) was not recorded.

Results: There was a significant reduction in the frequency that TPA occurred due to the policy change from routine to selective TPA (100% vs 33%; P < 0.01). The rate that a patient was found to have a positive SLN improved from 18.4% to 38.3% when CAS was utilized (P < 0.0001). The positive predictive value (PPV) improved from 92% to 100% without any effect upon the false-negative rate for TPA.

Conclusion: This study documents the willingness of surgeons to participate in a voluntary policy change; in doing so, surgeons were correct in predicting a positive SLN more than one third of the time. Given the improved PPV and unaffected false-negative rate, there was less risk of an unnecessary axillary dissection without any change in the possibility that a needed axillary node dissection might be delayed by a false-negative result. Clinical assessment of an SLN by the surgeon is shown here to be effective and safe. Selectively using TPA can help avoid operating room delays while awaiting TPA results, thereby allowing for improved operative efficiency without risk to the patient.
**Impact of Neoadjuvant Chemotherapy on Rate of Tissue Expander/Implant Loss and Progression to Successful Breast Reconstruction Following Mastectomy**

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**Purpose:** Reconstruction failure after mastectomy can be significant. In this study, we examined the rate and causes of expander and implant reconstruction failure in patients undergoing neoadjuvant chemotherapy.

**Methods and Materials:** One hundred nineteen patients with clinical stage II/III breast cancer were enrolled into a clinical trial of 6 cycles of epirubicin/taxotere chemotherapy. Four cycles were given preoperatively and 2 cycles were given postoperatively. Patient demographics, tobacco use, radiation treatment, and data relating to the loss of tissue expander as well as progression to implant and implant loss was collected as part of the trial or from review of medical records.

**Results:** Of 119 patients, 61 patients underwent 75 total mastectomies (47 unilateral and 14 bilateral). Of these patients, 26 had tissue expanders placed at the time of mastectomy (9 unilateral and 8 bilateral). Of the 34 total tissue expanders placed, 11 were lost prior to definitive implant placement and 20 tissue expanders were successfully progressed to definitive implant exchange. However, 4 of the permanent implants were also lost following placement. Only 16 of the original 34 total tissue expanders placed (47%) progressed to successful implant placement without loss. Tissue expander loss occurred most frequently due to infection (n = 8) and implant loss occurred most frequently as a result of extrusion (n = 2). Expander/implant loss also resulted in 15 additional operations including 1 patient who underwent 5 reconstructions. Radiation therapy did not appear to influence rate of loss or cause of loss.

**Conclusion:** Immediate tissue expander placement and reconstruction led to a failure of completion in more than 50% of the patients in this study and resulted in multiple reoperations. Our results suggest that use of reconstruction with tissue expanders in patients undergoing neoadjuvant chemotherapy should be used cautiously in this patient population.
**Axillary Lymph Node Involvement in T3 Breast Cancers: What Patients Are Potential Candidates for Sentinel Lymph Node Biopsy?**

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*University of Miami, Miami, FL, United States*

**Introduction:** The role for sentinel lymph node biopsy (SLNB) is well defined in T1 and T2 breast cancer. The role of SLNB in T3 breast cancer is poorly understood. We sought to define the outcomes and incidence of positive nodes for patients presenting with T3 breast cancers.

**Methods:** The prospective tumor registry of a tertiary cancer center and county hospital between 1998 and 2006 was queried and all patients with T3 breast cancer identified. All patients had axillary staging. Data analyzed included patient factors (age at diagnosis, family history of breast cancer, race, ethnicity, smoking history, and alcohol use) and tumor characteristics [size, location, histology, histological grade, nuclear grade, ER status, Her2 Neu status, presence of lymphovascular invasion (LVI), presence of DCIS, LCIS and atypia, multifocality].

**Results:** A total of 99 female patients with T3 breast tumors were identified. Age ranged from 28 to 86 years. 83.8% of all cancers were infiltrating ductal carcinoma. The median follow-up was 29 months. Sixty-five patients (66%) had positive metastatic axillary lymph nodes (LN). Among the patients with positive lymph nodes, 51% had more than 4 positive LN (+LN). The patients with more than 4 +LN had a significant decreased overall survival (84 months) when compared to patients with less than 4 +LN ($P = 0.04$). Univariate analysis showed that LVI ($P < 0.001$) and tumor size $> 7$ cm ($P = 0.003$) were the only significant factors associated with LN involvement. Tumors $> 7$ cm had an incidence of positive axillary LN of 83.7% versus 51.8% in tumors $< 7$ cm ($P = 0.01$). Patients with LVI had an incidence of +LN of 87.8% versus 47.2% for patients without LVI ($P < 0.001$). When LVI and tumor $> 7$ cm were combined the incidence of +LN was 95% versus 36.4% if no LVI and tumor $< 7$ cm ($P = 0.001$). By multivariate analysis significant predictors for LN metastasis were LVI (HR = 8.6, $P < 0.001$) and tumors $> 7$ cm (HR = 3.9, $P = 0.016$).

**Conclusion:** T3 breast cancers are associated overall with a 65% rate of lymph node positivity. The overall survival is directly associated with the number of positive nodes. LVI and tumor size $> 7$ cm place patients at a significantly higher risk of having axillary involvement. SLNB may have a role in T3 breast cancers, particularly when tumors are under 7 cm or no LVI is present, sparing axillary dissection in approximately half the patients.
Do Sentinel Node Micrometastases Predict Local Recurrence Risk in Ductal Carcinoma In Situ and Ductal Carcinoma In Situ With Microinvasion?

Colleen Murphy\(^1\), Julie Jones\(^2\), Sara Javid\(^1\), James Michaelson\(^1\), Matthew Nolan\(^1\), Stuart Lipsitz\(^2\), Michelle Specht\(^1\), Beth-Ann Lesnikoski\(^2\), Kevin Hughes\(^1\), Michele Gadd\(^1\), Barbara Smith\(^1\)

\(^1\)Massachusetts General Hospital, Boston, MA, United States, \(^2\)Brigham and Women's Hospital, Boston, MA, United States

Introduction: Micrometastases or isolated tumor cells are found on sentinel node biopsy (SNB) in 8-12% of patients with DCIS or DCISM. Studies of patients undergoing modified radical mastectomy find no increase in distant recurrence in DCIS patients with these positive-node findings. There is little data on the implications of such SNB metastases in patients receiving lumpectomy and radiation. As local recurrence rates remain high after lumpectomy for DCIS, we wished to determine if SNB pathology predicted local recurrence risk in DCIS.

Methods: Retrospective chart review identified patients with DCIS or DCISM who underwent SNB from 1997-2003. SNB was performed with mastectomy, with lumpectomy for large or high-grade DCIS lesions, or if DCISM was identified on diagnostic biopsy. SNB findings and local, regional, and distant breast cancer recurrences were determined.

Results: Three hundred twenty-two patients underwent SNB for DCIS (237) or DCISM (85). Median number of nodes removed was 2 (range, 1-8). Two hundred nineteen patients were treated with mastectomy and 103 with lumpectomy. There were 13 local recurrences (4.0%) at a median follow-up of 47.9 months (range, 0-110.6), 12 in patients with negative SNB and 1 with a positive SNB. Invasive carcinoma was found in 7 recurrences (58%), DCIS in 5 (42%), and 1 could not be determined. In 29 patients with positive SNBs there was 1 recurrence (3.4%). There were 4 recurrences after mastectomy and 9 after lumpectomy. There were 4 breast cancer–related deaths, 3 in patients with synchronous contralateral invasive cancer and 1 in a patient with DCISM who developed metastases after local recurrence.

Conclusions: A positive SNB in patients with DCIS or DCISM is not associated with higher risk of local recurrence after breast conservation or mastectomy. Other features of DCIS and DCISM may be important in predicting risk of local recurrence.

<table>
<thead>
<tr>
<th></th>
<th>#</th>
<th>Local Recurrence</th>
<th>%</th>
<th>P value</th>
<th>Distant Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastectomy SNB+</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>P = 0.99</td>
<td>0</td>
</tr>
<tr>
<td>Mastectomy SNB-</td>
<td>198</td>
<td>4</td>
<td>2.0</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Lumpectomy SNB+</td>
<td>8</td>
<td>1</td>
<td>12.5</td>
<td>P = 0.53</td>
<td>0</td>
</tr>
<tr>
<td>Lumpectomy SNB-</td>
<td>95</td>
<td>8</td>
<td>8.4</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>
Incidence of Micrometastases in the Blood and Bone Marrow, and Correlation With Lymph Node Metastases in Patients With Operable Breast Cancer

Jonathan Nelson, Kailash Mosalpuria, Savitri Krishnamurthy, Massimo Cristofanilli, Funda Meric, Isabelle Bedrosian, Balraj Singh, Anthony Lucci

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Introduction: Micrometastases (MM) in blood (circulating tumor cells = CTCs), bone marrow (disseminated cells = DTCs), and lymph nodes (LN) are thought to have prognostic implications for patients with breast cancer. While there is significant data documenting prognostic significance for DTCs, there is little data on CTCs in operable patients. The purpose of this study was to assess the incidence and possible correlations between CTCs, DTCs, and LN metastases in operable breast cancer patients.

Methods: We prospectively evaluated 109 patients undergoing surgery for stage I-III breast cancer. The presence of CTCs in blood was detected using the Cellsearch system (Veridex Corp., Warren, NJ). CTCs were defined as ≥1 nucleated cell/10 mLs of blood lacking CD 45 but expressing cytokeratins (CKs) 8, 18, or 19. Bone marrow aspirate (10 ml from each iliac crest) was harvested and prepared using cytopsin and Ficoll gradient, and evaluated with immunocytochemistry for presence of CK. Any cell(s) staining positive for CK (and meeting morphologic criteria for malignancy) was considered a positive result.

Results: Forty-seven percent (51/109) of patients had positive lymph nodes, with 11% (11/103) having metastases between >0.2 mm and <2.0 mm (N1mi), and 11% (8/72) having isolated tumor cells (ITC) (<0.2 mm, N0i) in SLNs. CTCs and DTCs were identified in 38% and 23% of patients, respectively. There were no statistically significant correlations between presence of CTCs, DTCs, and LN metastases. Her-2+ status correlated with CTCs ($P = 0.02$, OR = 4.59), but not DTCs. Tumor size correlated with LN positivity ($P < 0.0001$) but not with CTCs or DTCs. LN MM (N1mi) correlated with premenopausal status ($P = 0.04$, OR = 4.25), PgR positivity ($P = 0.04$, OR = 5.12), and lymphovascular invasion ($P = 0.01$, OR = 6.32). ITCs in LNs did not correlate with any clinicopathologic factors.

Discussion: CTCs and DTCs are found in a significant number of patients with operable breast cancer, but do not correlate with LN metastases. This data suggests independent routes of spread and mechanisms of disease progression between CTCs/DTCs and LNs.
Patient Distress at Initial Breast Health Center Consultation Is Associated With Factors Other Than Diagnosis

Melody Ng, Steve Brown, Pamela Esquivel, Sharmila Roy-Chowdhury, Jan H. Wong, Sharon Lum

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Introduction: It is well recognized that women diagnosed with breast cancer experience increased distress. Women seen in a breast health center, however, are often referred for conditions other than breast cancer. We hypothesize that levels of distress in patients undergoing evaluation at a breast health center are unrelated to diagnosis.

Methods: Three hundred sixteen patients undergoing evaluation for breast-related complaints at a breast health center were asked to score their distress on a standard distress thermometer and to rate their degree of concern regarding 38 elements that reflect physical, family, emotional, spiritual, and practical problems. Analyses by linear regression and Mann-Whitney U test were carried out, where appropriate.

Results: The most frequent ethnic group was White (64.4%), followed by Hispanic (15.6%). 63.6% of patients were married, 13.1% were single, and 9.6% were widowed. 24.3% of patients had a diagnosis of breast cancer, 36.3% were undergoing evaluation for a breast lump/mass, 28.2% had an abnormal mammographic or ultrasound finding, and the remaining 11.4% had other diagnoses. 39.2% of patients reported high distress (distress thermometer score ≥4 of 10), whereas 60.8% reported low distress (distress thermometer score <4). Those individuals with high distress had statistically higher pre-visit practical (z = 6.5526, P < 0.0001), family (z = 5.6563, P < 0.0001), emotional (z = 8.3469, P < 0.0001), spiritual (z = 4.4863, P = 0.000007), and physical (z = 6.4128, P < 0.0001) problems as compared to those with low distress. When the level of distress was characterized as either high or low, there was no correlation between distress level and presenting complaint of cancer versus noncancer diagnoses (R² = 0.0003).

Discussion: The distress levels of patients presenting to a breast health center are not associated with medical reason for visit (breast cancer, abnormal imaging, breast lumps/masses, or other reasons), but rather with such factors as practical, family, emotional, spiritual, and physical problems. These results emphasize the importance of screening for distress, regardless of the presenting diagnosis and, if indicated, implementing interventions to alleviate distress in all patients presenting to a breast health center, not only those with a known cancer diagnosis.
**Do the Various Methods of Intraoperative Assessment of Lumpectomy Margins Impact Re-Excision Rates?**

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University of Rochester, Rochester, NY, United States

**Background:** Adequate breast-conserving surgery (BCS) requires obtaining negative surgical margins while preserving cosmesis. The goal of BCS, therefore, is to remove just enough tissue at the time of the initial operation with a single excision. Most studies report a 30-50% incidence of re-excision. The purpose of this study was to determine whether different operative techniques affect re-excision rates.

**Methods:** Three techniques were used by surgeons at a single institution: (1) lumpectomy with gross inspection/palpation of intact specimen by surgeon intraop with selective excision of additional tissue, (2) lumpectomy with gross inspection/palpation of sectioned specimen by both surgeon and pathologist intraop with selective excision, and (3) lumpectomy with routine excision of all 6 walls of cavity. One hundred consecutive patients receiving lumpectomy by each technique were studied. Pathology and operative reports were reviewed to determine margin status, tumor histology [ductal carcinoma in situ (DCIS) vs invasive vs both], and re-excision rates. All patients with nonpalpable lesions had wire localization and intraop specimen mammograms. Re-excisions were performed for margins <3 mm.

**Results:** Overall 47% re-excision rate in all 3 groups. 25% had only DCIS, 28% only invasive cancer, and 47% had both.

<table>
<thead>
<tr>
<th>Group</th>
<th>% Re-excision</th>
<th>% Re-excision Invasive Only</th>
<th>% Re-excision DCIS Only</th>
<th>% Re-excision Any Invasive</th>
<th>% Re-excision Any DCIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42*</td>
<td>26</td>
<td>54</td>
<td>38</td>
<td>47</td>
</tr>
<tr>
<td>2</td>
<td>44*</td>
<td>20</td>
<td>36</td>
<td>47</td>
<td>55</td>
</tr>
<tr>
<td>3</td>
<td>57</td>
<td>41</td>
<td>52</td>
<td>55</td>
<td>60</td>
</tr>
</tbody>
</table>

*P < .05 when compared to Group 3.

**Conclusions:** Routine excision at time of lumpectomy does not lower the re-excision rate for BCS. It is less likely to ensure negative margins compared to the other intraoperative techniques that utilize selective excision. There is an association between DCIS and higher re-excision rates, although not significant. Further study with a larger sample size is warranted.
Minimal Access Breast Surgical Procedures for Lesions Not Visible by Ultrasound

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Introduction: RF (radiofrequency electrosurgical) loop devices have been introduced for incisional and excisional biopsy of ultrasound visible lesions. The purpose of this study was to evaluate these flexible loop electrosurgical RF devices to resect breast for surgical diagnostic or therapeutic biopsy of lesions not visible by ultrasound.

Methods: This is a retrospective single-surgeon review series of minimally invasive breast surgical cases. The operations were performed using 1 of 2 flexible loop electrosurgical electrode devices for breast biopsy by Rubicor (Phantom and Halo) under local/sedation.

Results: The device was used for 27 female patient breast procedures on lesions not visible by ultrasound. The patients ranged in age from 27 to 76, with an average of 49.5. Bloody nipple discharge was the most common reason for operation in 19 of 27. In each of these cases, the bleeding lesion was identified by sub-millimeter breast endoscopy and the resection guided under endoscopic visualization. The total resections were 26 with 1 failure of appropriate deployment and need for routine excisional biopsy. Two specimens revealed ductal carcinoma in situ. All margins were negative. Pathology reveals a volume of up to 58 cubic millimeters and 32 grams obtainable.

<table>
<thead>
<tr>
<th>Number resected</th>
<th>26/27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic tool</td>
<td></td>
</tr>
<tr>
<td>ROBE</td>
<td>22/27</td>
</tr>
<tr>
<td>U/S</td>
<td>0/27</td>
</tr>
<tr>
<td>Needle localization</td>
<td>6/27</td>
</tr>
<tr>
<td>Device</td>
<td></td>
</tr>
<tr>
<td>Halo</td>
<td>13</td>
</tr>
<tr>
<td>Phantom</td>
<td>14</td>
</tr>
<tr>
<td>Pathology</td>
<td></td>
</tr>
<tr>
<td>Benign</td>
<td>25/27</td>
</tr>
<tr>
<td>Premalignant/malignant</td>
<td>2/27</td>
</tr>
<tr>
<td>Margins</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>27/27</td>
</tr>
<tr>
<td>Positive</td>
<td>0/27</td>
</tr>
</tbody>
</table>

Discussion: The Rubicor flexible loop electrosurgical devices provide a less invasive modality for diagnostic and possibly therapeutic breast excision. Such devices open the possibilities of minimally invasive approaches to lumpectomy of cancerous lesions or surgical biopsy without necessarily requiring ultrasound visibility to guide resection.
Identification of Surgical Quality Indicators in Breast Cancer Surgery

Alicia Privette, Laurence McCahill, John Ratliff, Richard Single, Ted James, Mary Stanley, Seth Harlow, Johanna Sheehey-Jones, Nicole Messier

University of Vermont/Fletcher Allen Health Care, Burlington, VT, United States

Introduction: There is growing interest among government, insurance, and patient advocacy organizations in defining surgical quality measures. These efforts have focused primarily on factors influencing operative mortality, which is not applicable to breast cancer surgery. We proposed specific surgical outcomes as quality measures for initial breast cancer operations and assessed the feasibility of measurement and the variation between individual breast surgeons at a single academic institution.

Methods: Initial surgeries for a known breast malignancy were identified. Data was collected prospectively by specialized breast care nurses, entered into a central database, and reviewed by a surgeon for accuracy. Measures assessed were: (1) total mastectomy (TM) rate, (2) positive and close (<1 mm) margin rate after partial mastectomy (PM), (3) mean number operations to obtain appropriate margins after PM, (4) number of lymph nodes from axillary dissection (AD), (5) proportion of completion AD performed after positive sentinel node biopsy (SLNB).

Results: Six hundred fifty-five operations (DCIS = 149, invasive = 506) performed by 4 surgeons from April 2003-March 2007. (1) Institutional rate of initial TM was 24.7% (162/655) - 21.5% (32/149) for DCIS, and 25.7% (130/506) for invasive cancer. TM rate varied significantly by surgeon (20.2-40.5%, P = .03), while mean tumor size (2.47 cm) did not (P = NS). (2) Combined positive or close margin rate after PM was 29.6% (146/493) and varied by surgeon (14.5-38.3%, P < 0.01). Close margin rate was 19.1% (94/493) and varied by surgeon (P < 0.01), while positive margin rate (10.5%) did not (P = NS). (3) Mean operations after initial PM was 1.14, and did not vary by surgeon (1.09-1.17, P = 0.65). (4) Median number of nodes retrieved with AD was 15 (range, 1-44) and varied by surgeon (10-17, P = 0.034). (5) AD following positive SLNB (n = 78) demonstrated a wide range but did not vary significantly by surgeon (48.1-85.7%, P = 0.22).

Conclusions: Quality indicators for breast cancer surgery are identifiable, quantifiable, and can feasibly be assessed. We have identified variation in surgical practice patterns even among high-volume surgeons. Implications of variability in surgical practice to more meaningful outcomes of patient satisfaction, breast cancer local recurrence, and survival are unknown. Further study into the reasons for surgical practice variability and correlation to long-term disease outcomes is warranted.
Stand-Alone Sentinel Node Biopsy Assists in Choosing Candidates for Immediate Breast Reconstruction

Rochelle Ringer, Gretchen Ahrendt, Ronald Johnson, Marguerite Bonaventura, Jeffrey Falk, Donald Keenan

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The indications for postmastectomy radiation therapy continue to evolve and present a challenge for the timing of breast reconstruction in breast cancer patients who undergo therapeutic mastectomy. The purpose of this study is to determine the efficacy of initial staged sentinel node (SLN) biopsy to assist in the identification of patients who require postmastectomy radiation therapy in women with invasive breast cancer who desire immediate breast reconstruction. In January 2007, we implemented a protocol to perform staged SLNB in patients requiring therapeutic mastectomy who did not have overt indications for PMRT. Twenty-five patients who had clinically and radiographically node-negative invasive breast cancers underwent staged SLNB with delayed mastectomy ± reconstruction.

The mean age of our patient population was 46.4 years (31-65). The mean tumor size was 3.1 cm (0.5-10.3). Multifocal disease was present in 72% of the patients and 68% had multicentric disease. The primary histology was: invasive ductal carcinoma in 72%, invasive lobular carcinoma in 20%, and mixed invasive and ductal in 8%.

<table>
<thead>
<tr>
<th>Number of SLNB (+)</th>
<th>6 (24%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient with ≥ 4 LN (+)</td>
<td>2 (8%)</td>
</tr>
<tr>
<td>Patient receiving PMRT</td>
<td>3 (12%)</td>
</tr>
</tbody>
</table>

In our population, 6 patients (24%) had positive sentinel lymph nodes and required completion ALND. Half of the ALND were performed at the time of the initial SLN biopsy and half were performed at the time of the mastectomy. Of these patients, 4 met the criteria for PMRT and delayed their breast reconstruction, however, PMRT was not completed in 1 patient. Staged SLN biopsy can assist in identifying candidates for PMRT. It is optimal to perform a SLN biopsy with simultaneous ALND followed by mastectomy to most accurately define who needs PMRT.

Staged SLNB is an appropriate approach for invasive breast cancer patients who are being considered for immediate breast reconstruction.
Correlation of Protein and Gene Expression for the Stratification of Breast Cancer Patients

Anne Rosenberg, Judy Quong, Yamini Sabherwal, Kristin Brill, Sumera Farooqi, Wen-shuz Yeow, Alima Minkeu, Andrew Quong

Thomas Jefferson University, Philadelphia PA, United States

Background: Our understanding of the molecular basis of breast cancer has increased tremendously over the past years concurrent with advances in genomic and proteomic technologies, such as real-time polymerase chain reaction (RT-PCR), mass spectrometry and liquid chromatography. We are beginning to see advances toward molecular signatures such as Oncotype DX™, a 21-gene panel that is used to determine recurrence for ER-positive, node-negative, tamoxifen-treated tumors. In the present study we have determined the correlation between gene and protein expression in breast tumors. Toward the development of a serum-based diagnostic based on protein expression, we evaluate the protein expression levels of the 21-gene panel in breast tumor and serum.

Methods: Primary breast tumors were obtained directly after surgical excision, stored immediately on ice, manually dissected, and snap frozen in liquid nitrogen. RNA and protein were obtained from the same section of tumor using Qiazol and RNeasy spin columns (Qiagen). Gene transcription was determined using RT-PCR using TaqMan Low-Density Arrays (Applied Biosystems). Protein expression was determined by Western Blot, and statistical analysis was performed using Minitab software (Minitab).

Results: For the 16 “cancer” proteins in the panel, we find correlation ($P < 0.05$) for 8 of the 16 genes/proteins. At the level of $P < 0.10$, this correlation increased to 12 of 16 genes/proteins. Those that show lower correlation are not well reproduced at the protein level and the protein measurements are being done by ELISA. Furthermore, we find that 15 of these 16 proteins are detectable in serum.

Conclusion: The high concordance between gene and protein expression in tumors and the detectability of the same proteins in serum suggest that a serum-based prognostic is achievable in the near future.
Patient Satisfaction and Depression Scores Following Contralateral Prophylactic Mastectomy for Unilateral Breast Cancer

Anne Rosenberg, Kristin Brill

Kimmel Cancer Center, Jefferson Medical College, Philadelphia, PA, United States

Introduction: Increasingly, women undergoing mastectomy with immediate reconstruction for unilateral cancer are opting for contralateral prophylactic mastectomy. It is critical to understand their longer term satisfaction and quality of life.

Methods: All women undergoing mastectomy for unilateral cancer at a single institution were considered from January 2001 to June 2005. Those women opting for contralateral prophylactic mastectomy were identified. A retrospective questionnaire was provided to ascertain demographic information, stage of disease, type of reconstruction (if performed), CES-D depression scale, RIES subjective stress scale, quality of life, and satisfaction assessment. The questionnaire was distributed by mail in a blinded fashion to 91 women in September 2006 with voluntary responses requested.

Results: For the time period stated, 58% of the women with unilateral breast cancer undergoing mastectomy elected immediate reconstruction. Of these, 65% elected contralateral simultaneous mastectomy. Surveys were sent to 90 women with a 39% response rate (35 patients). Twenty percent of women were stage 0, 46% were stage 1, and 20% were stage 2. Of the 35 patients, 64% chose latissimus dorsi flap reconstruction with tissue expander, 33% chose tissue expander alone, and only 1 patient chose a bilateral TRAM reconstruction. Thirteen women (33%) had no depression by either CES-D or RIES, while 13 women had evidence of mild depression on the CES-D. Only 1 woman had no evidence of depression but demonstrated some situational stress on the RIES. Eight patients demonstrated evidence of mild depression and mild posttraumatic stress. None of the responders reported severe depression or stress. Of the surveys returned, almost all women indicate the highest level of satisfaction with their decision, and “quite satisfied” with their surgical results. All patients reported a desire to effect lifestyle changes with diet, exercise, and smoking cessation, and the majority had already implemented these changes.

Conclusion: Women treated for early unilateral breast cancer with mastectomy are frequently opting for contralateral mastectomy. They are typically married with children, with some college education. The majority are extremely satisfied and feel in control of their future risk of recurrence. They are very satisfied with cosmesis, return to function, and are proactive with lifestyle changes.
Skin-Sparing Mastectomy With Delayed Implant Reconstruction

Jason Rousseau, Richard Orr, John Lettieri, R. Barry Hird

Gibbs Cancer Center, Spartanburg, SC, United States

Introduction: Skin-sparing mastectomy (SSM) is an oncologically safe operation and provides superior cosmetic outcomes when compared to total mastectomy. This technique can be used in conjunction with immediate autologous tissue or expander/implant reconstruction. However, the type and timing of reconstruction may be complicated by factors such as postmastectomy radiation therapy and smoking. We describe a novel technique of performing SSM without any form of immediate reconstruction. Rather we performed delayed expander/implant reconstruction using the redundant, floppy chest wall skin up to 455 days after the original SSM.

Methods: Patients undergoing mastectomy who were not candidates for immediate reconstruction were given the option of SSM with delayed reconstruction. Patients were cared for by 1 of 2 surgical oncologists and a single plastic surgeon.

Results: Five patients underwent unilateral SSM for either invasive or noninvasive breast cancer. The size of the cancers ranged from 2 to 29 mm. All patients underwent sentinel lymph node biopsy and 1 underwent completion axillary lymph node dissection for a positive sentinel node. The average time from SSM to first stage of reconstruction was 198 days (range, 104-455). Final implant size ranged from 395 to 525 cc. All cosmetic outcomes were deemed to be good or excellent.

Discussion: We have demonstrated that the redundant floppy chest wall skin does retain its elasticity and can be expanded and utilized up to fifteen months after SSM with excellent cosmetic outcomes. This technique might be valuable to surgeons in smaller communities who do not have reconstructive capabilities available at the time of SSM. Furthermore, this approach would be useful for patients undecided about reconstruction at the time of mastectomy but would like to maintain the option of optimal cosmetic outcome if they do pursue reconstruction at a later date. Finally, we have eliminated the unnecessary mobilization and division of some of the pectoralis major muscle attachments in those patients who are subsequently deemed not to be candidates for expander/implant placement.
Comparative Analysis of MRI Versus Mammography in Evaluation of Size, Number of Lesions, and Nodal Status of Breast Cancer

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Introduction: Magnetic resonance imaging (MRI) is thought to be more sensitive and specific in evaluating patients with breast carcinoma (BrCa) than mammogram. Our current study compares the size of the lesions, additional lesions, lymph node status, and assessment of contralateral breast between MRI and mammogram.

Methods: A retrospective study was performed on 195 patients with BrCa undergoing MRI and mammogram, with number and size of lesions compared to pathology.

Results: Tumor size was reported in 184 lesions by MRI and 113 lesions by mammogram. Of the lesions identified by both MRI and mammogram, pathologically T1 lesions accounted for 35%, T2 for 39%, T3 for 13%, T4 for 4%, and in situ lesions for 9%. In 184 MRI-detected lesions, 9% had exactly the same size, 65% were overestimated by a mean of 1.04 cm, and 26% were underestimated by a mean of 0.65 cm. For the mammogram-detected lesions (n = 113), 11% had the same size, 37% were overestimated by a mean of 0.81 cm, and 52% were underestimated by a mean of 0.74 cm. Of the 184 MRI-detected lesions, 36 were additional malignant lesions identified in 29 patients (15%) with 8 lesions found on contralateral breast requiring a change of surgery. The MRI also detected suspicious lymphadenopathy in 15% patients.

Conclusion: In the majority of patients, MRI overestimated the size of the tumor by a mean difference of 0.97 cm compared to pathologic size, whereas mammogram underestimated size by a mean of 0.74 cm. This might be particularly important for T1 and T2 lesions, where size is the most important criterion for the T-stage classification. The identification of additional lesions found on the MRI further supports the utility of MRI over mammogram in the management of early breast cancer.

Comparison of Total Number of Lesions Overestimated and Underestimated by Both MRI and Mammogram When Compared to Pathology in 113 Lesions

<table>
<thead>
<tr>
<th>Compared to Pathology</th>
<th>MRI (n = 184)</th>
<th>Mammogram (n = 113)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overestimated</td>
<td>119 (65%)</td>
<td>42 (37%)</td>
</tr>
<tr>
<td>Underestimated</td>
<td>48 (26%)</td>
<td>59 (52%)</td>
</tr>
<tr>
<td>Same size</td>
<td>16 (9%)</td>
<td>12 (11%)</td>
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Factors Associated With Re-Excision in Early-Stage Breast Cancer Patients Undergoing Breast Conservation Surgery

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Introduction: Breast conservation surgery (BCS) is the standard of care for early-stage breast cancer. One of the major risks is a higher incidence of loco-regional recurrence when compared to patients undergoing mastectomy. Several studies have identified predictors of loco-regional recurrence in these patients. Of these predictors, a surgical margin is the 1 factor that surgeons can modify. The aim of this study was to identify factors associated with positive surgical margins and re-excision (RE).

Methods: A retrospective chart review of 552 patients seen at The George Washington University Department of Surgery Breast Care Center between September 2001 and July 2007 was performed. Patients who underwent BCS and had positive margins were identified, and their method of detection, pathology, location of inadequate resection, and RE pathology were analyzed.

Results: Of the 356 patients who underwent BCS, 118 (33%) went on to RE for positive margins. Sixty-two percent of all those requiring RE initially presented as a radiological finding compared to 32.2% palpable lesions and 5% nipple discharge. A majority (85%) of patients presenting with nipple discharge went on to RE. Fifty-one percent of DCIS patients went on to RE compared to 26% invasive carcinomas. Sixty percent of RE patients had preoperative wire placement and 3.3% had an intraoperative ultrasound. Low-, intermediate-, and high-grade tumors were equally distributed among RE patients. Fifty percent of T3 tumors went on to RE, compared to 32% T1 and 17% T2. Multiple margins were involved in 42% of RE patients. The majority of pathology present at the positive margin was DCIS (65%). The RE specimen had no residual disease in 50.5% of cases, while 38.4% had DCIS, and 11.1% had invasive carcinoma. Most patients underwent only 1 RE (81%) and 74.5% were ultimately able to have BCS.

Discussion: One third of our BCS patients went on to RE. Factors associated with positive margins are radiologically detected lesions, patients presenting with nipple discharge, diagnosis of DCIS, and larger tumors. Many patients had multiple margins involved, and most had DCIS at the margin. No residual disease was identified at RE in half of the patients and most were able have BCS.
A Randomized Comparison of Topical 4% Liposomal Lidocaine Versus Placebo to Reduce Pain and Anxiety During Periareolar Sentinel Lymph Node Injections

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Introduction: Sentinel lymph node biopsy is an essential component of breast cancer staging. Periareolar (technetium 99 sulfur colloid) nuclear medicine injections are associated with pain and anxiety. This study compared preprocedural application of topical 4% liposomal lidocaine cream (LLC) versus placebo for perceived differences in anxiety and pain due to sentinel lymph node (SLN) nuclear medicine injections.

Methods: In an IRB-approved, prospective, randomized, double-blinded study, 42 patients underwent application of either placebo or topical 4% LLC to their areola with a 1-cm margin prior to SNL injection. All eligible breast cancer patients presenting to the outpatient surgery center who were >18 years, nonbreastfeeding, without lidocaine allergies, and without prior periareolar surgeries were offered enrolment in this study. Using 2 10-point visual analogue scales the patients evaluated their anxiety and pain pre- and post-areola nuclear medicine injections. Data was analyzed using Wilcoxon rank tests.

Results: Eighty-eight percent of the females participating in this study were Caucasian, the average age was 55 (SD, 10.7), and the average weight was 75.7 kg (SD, 17.0). None of the patients had signs of an allergic reaction to the creams. Mean time from cream application to injection was 32.2 (SD, 12.2) minutes. Pain was perceived differently between the lidocaine group (n = 20) and the placebo group (n = 22) (P = 0.052). The lidocaine group reported a 1-point increase in median pain score (P = 0.002), compared to the 4-point median increase within the placebo group (P < 0.001). No differences were found in pre- and post-anxiety in either group (P = 0.5). There was 100% lymph node identification in both groups.

Discussion: Preoperative topical 4% LLC significantly decreases the perceived pain of SLN injections without any compromise in lymph node identification. Anxiety is not affected by placebo or lidocaine cream application.
Effectiveness of a Noninvasive Automated Infrared Imaging System As an Adjunctive Modality in the Detection of Palpable and Nonpalpable Breast Cancer

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Introduction: The purpose of this study was to determine the effectiveness of state-of-the-art infrared imaging system, Sentinel BreastScan™ (SBS), in clinically detecting pathology in 98 patients about to undergo biopsy for mammographically (or ultrasonically) suspicious findings (BIRADS 4 and 5).

Methods: An IRB-approved, 2-year study was conducted at Cornell, using the SBS as a clinical test in 98 patients for whom a breast biopsy had been recommended on the basis of a suspicious mammogram or ultrasound. The study resulted in 101 biopsies, revealing 62 malignant and 39 benign lesions. The SBS administers an automated test 5 minutes in duration. The system’s software analyzes the patient’s recorded data and provides a graded “risk” of cancer report. Additionally, artificial intelligence software compares the patient’s data to those “known” patients in the SBS database and provides an independent assessment of risk. The system has 2 modes of operation: “screening” mode, which operates without input of any patient clinical data, and “clinical” mode, which expands the system’s sensitivity in geographic areas identified as having a clinical concern.

Results: The SBS data and reports were analyzed in the screening and clinical modes. In the screening mode, the SBS demonstrated a sensitivity of 95.2%, a specificity of 35.9%, and an NPV (negative predicative value) of 82.4% ($P = 0.0001$). Since every patient in this study was being evaluated for a mammographic- or ultrasound-identified lesion, each patient had at least 1 area in the breast that was highly suspicious. These specific areas were then subjected to reanalysis by the SBS in the clinical mode, using this additional clinical input. In this mode, the sensitivity was again measured at 95.2%, the specificity increased to 48.7%, the NPV improved to 86.4% ($P = 0.0001$), with a prevalence of 61%.

Discussion: A new infrared breast screening system was tested preoperatively in a group of 98 patients considered at high risk of malignancy. The SBS correctly identified these clinical studies as suspicious for malignancy in 95.2%. Specificity ranged from 35.9 to 48.7% depending on the level of prior clinical information provided to the system’s computer program. When used adjunctively, the SBS can improve breast cancer detection.
A Novel Model of Breast Care Which Improves Surgeon Efficiency

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Introduction: Breast care management has become increasingly more complex and requires a comprehensive assessment and input from multiple specialties. In most breast care models the surgeon is the primary provider in the breast clinic. In our unique model the patient’s initial consultation is with a primary care physician specializing in breast disease who consults physicians in other specialties as needed. The aim of this study is to examine the impact of this model of care on surgeons’ efficiency.

Methods: Retrospective chart review was performed on all new patients seen in the breast clinic (BC) over a 1-month period. Patient presentation, length of consultation, number of surgical referrals, biopsy prior to surgical consultation, and number of patients scheduled for surgery were reviewed. A descriptive analysis was performed.

Results: For the period August 15, 2007, to September 15, 2007, 436 new patients were seen in the BC, with 104 patients (24%) referred for surgical consultation. Among these 104 patients, the chief complaint at initial presentation to BC was mammographic abnormality, 34 (32%); biopsy-proven cancer at outside institution, 34 (32%); palpable mass, 22 (21%); prior cancer excision elsewhere with positive margins, 5 (4.8%); nipple abnormality, 6 (5.7%); high-risk patient, 2 (1.8%); and breast pain, 1 (0.9%). Additional needle biopsy was obtained in 60 (58%) of 104 women subsequently referred to surgery as part of their BC workup. Of these 60 biopsies, 48 new cancers were diagnosed. The remaining 12 biopsies were performed in the 39 patients presenting with biopsy-proven cancer (9 axillary lymph node fine needle aspirations and 3 breast core biopsies). At the time of surgical consultation, 87 patients (84%) had biopsy-proven cancer, and 90 patients (86%) were scheduled for surgery. An average of 57 minutes (range, 30 to 120) was spent by the BC physician at the initial consultation.

Discussion: We present a unique model utilizing breast specialist physicians in the initial workup and counseling of patients with breast complaints. This results in the majority of patients evaluated by the surgeon being surgical candidates and minimizes time spent by the surgeon on nonoperative counseling.
Nipple-Sparing Mastectomy—Initial Experience at a Tertiary Center

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Background: Nipple-sparing mastectomy (NSM) combines skin-sparing mastectomy with preservation of the nipple areolar dermis, intraoperative pathologic assessment of the nipple core, and immediate reconstruction. Concerns with this procedure include postoperative complications and subsequent breast cancer risk due to possible retained ductal tissue. We evaluated our institutional experience with NSM in terms of clinical outcomes and cancer recurrence.

Methods: An IRB-approved retrospective review of patients undergoing NSM between November 2005 and June 2007 was performed. Neoplastic involvement of the nipple areolar complex (NAC) was assessed preoperatively with imaging, and intraoperatively with frozen section analysis of the nipple core in all cases. Information was reviewed on indications, pathologic findings, tumor size, and distance of tumor from the nipple, surgical complications, cosmetic outcomes, and local and distant recurrences of breast cancer.

Results: Eighteen NSM and 2 areola-sparing mastectomies (ASM) were performed. The mean patient age was 44. Indications for surgery were invasive cancer (4), DCIS (5), pseudoangiomatous stromal hyperplasia (PASH) (3), and risk reduction (8). Twelve patients (60%) had preoperative MRI in addition to mammographic imaging. The average distance of tumor from the nipple on imaging was 4.8 cm (range, 4-5.7 cm). No involvement of the nipple core was found on frozen or permanent section. Six patients underwent sentinel node surgery; all were node-negative. One patient who underwent NSM for invasive ductal carcinoma received radiation to the nipple areolar complex. Two cases developed partial desquamation of the NAC; all were node-negative. One patient who underwent NSM for invasive ductal carcinoma received radiation to the nipple areolar complex. Two cases developed partial desquamation of the NAC, but neither required debridement. One patient developed a seroma which did not require aspiration, and there were no wound infections. At a mean follow-up of 10.8 months, all NACs were intact and there were no local or systemic recurrences. Nineteen patients reported good cosmesis; 1 patient was dissatisfied due to change of nipple position.

Conclusion: NSM can be successfully achieved with low morbidity in appropriately selected patients. Nipple-areolar neoplastic involvement can be assessed adequately by preoperative imaging and intraoperative frozen section analysis.
Disparate Incidence of “Chemobrain”-Associated Morbidities in Breast Cancer Survivors

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Introduction: The chemobrain syndrome (CBS) is a disturbing morbidity associated with cancer therapy (Tx). Nowhere is this more evident than in breast cancer patients (BC pts) with expectation of long-term survival. Despite this, CBS is poorly understood with respect to incidence, duration, and association with other morbidities and particularly by surgeons who may be principally responsible for the patient’s long-term follow-up. This exploratory study assessed the CBS in BC pts as compared with lymphoma patients (Ly pts) receiving Tx comparable in intensity.

Methods: Fifty-four BC pts treated between 1997 and 2005 (52.8 ± 9 yrs) and 28 Ly pts treated between 1995 and 2006 (53.2 ± 13 yrs) were assessed during regular follow-up visits. All BC pts underwent surgical resection (mastectomy, 53%, and lumpectomy, 47%). Eighty-three percent of BC pts received chemoTx, mostly with an anthracycline + alkylating agent (93%); 43% received a taxane. All Ly pts had chemoTx; 82% had an alkylating agent; 50% had an anthracycline. RadiationTx was given to 61% and 36% of BC and Ly pts, respectively. HormoneTx and prednisoneTx was given to 74% and 25% of BC and Ly pts, respectively.

Results: Memory loss was documented in 31.5% and 7% BC and Ly pts, respectively (P < 0.02; χ²) and was not reduced with increasing time off Tx (35.2% vs. 30%, pre- and post-2001, respectively). Anxiety/depression was also increased significantly in BC vs. Ly pts (24% and 3.5% respectively; P < 0.02; χ²) and also not reduced with time off Tx. In contrast, the incidence of neuropathy (24% vs 25%), fatigue (30% vs 29%), and pain (26% and 14%) were comparable in BC and Ly pts, respectively. Incidence of memory loss was not different between BC pts receiving mastectomies (28%) versus lumpectomies (36%), or hormonalTx (53%) versus no hormonalTx (47%). Similar findings applied to radiationTx.

Conclusions: The results demonstrate a significant difference in the prevalence of CNS morbidities in BC pts compared to Ly pts who receive Tx of comparable intensity and who demonstrate a comparable incidence of peripheral morbidities. Neither the type, intensity, nor duration off Tx is sufficient to explain the prevalence of CNS morbidities in BC pts.
Incidence of False-Positive Findings on Breast MRI After Targeted Ultrasound in Patients With a Diagnosis of Breast Cancer

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Background: Magnetic resonance imaging (MRI) has been shown to be highly sensitive for breast cancer, but has a high risk of false-positive findings. In a previous study we assessed the ability of targeted ultrasound (TUS) to identify additional lesions detected by MRI in women with newly diagnosed breast cancer. TUS identified 89% of MRI-detected lesions. Based on our results, we concluded that TUS is a reliable method to correlate MRI abnormalities in a majority of breast cancer patients. The purpose of this study was to investigate the false-positive rate of MRI for additional suspicious breast lesions previously identified by TUS.

Methods: Two hundred seventy women underwent breast MRI between January 1, 1999, and July 15, 2004, at our institution. Medical records were retrieved and radiology, pathology, and operative reports were reviewed. TUS identified 73 additional suspicious lesions detected by MRI in 47 women evaluated for documented breast cancer.

Results: A total of 73 lesions were identified by TUS and 56 (77%) were biopsied. Seventeen (23%) of which were either high risk or malignant and 39 (53%) were benign. Seven (10%) lesions were not biopsied but identified as benign by TUS or with follow-up imaging. Ten (14%) benign lesions were confirmed after surgical removal. The overall number of benign lesions identified by TUS, core biopsy, or surgical removal was 56 (77%).

Conclusion: In women with newly diagnosed breast cancer, the false-positive rate for MRI in identifying additional lesions detected by TUS is 77%.
Breast Cancer in Hong Kong Chinese Women Aged Below 40
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Introduction: Studies have demonstrated that breast cancer in younger women tends to be biologically more aggressive, which leads to a worse survival than in older women. Most studies were performed on Western population. This study aims to compare the tumor biology and survival of breast cancer in Chinese young women with their older counterparts.

Methods: A retrospective study of patients with breast cancer who have undergone surgery at a university hospital from January 2001 to December 2005 was performed. Tumor characteristics and survival of patients aged below 40 were compared with those aged 40 and above.

Results: Nine hundred eighteen patients with breast cancer underwent surgery during the study period. Seventy-four patients (8.1%) were aged below 40 (mean age, 34.46) and 844 patients (91.9%) were aged 40 and above (mean age, 56.55). Rate of breast conservation is higher in the younger age group than in the older (age < 40, 27.0%, vs age ≥ 40, 18.8%; \( P = 0.000 \)); similarly rate of breast reconstruction were higher in the younger age group (age < 40, 17.6%, vs age ≥ 40, 3.8%; \( P = 0.000 \)). Tumor grading in younger women were significantly higher and more poorly differentiated (\( P = 0.001 \)). There were no difference in terms of proportion of invasive and in situ disease, histology type, tumor size, lymph node status, and overall staging. Hormonal receptors and HER-2 oncogene status were similar between these 2 groups. Five-year overall and disease-free survivals were also comparable.

Conclusions: Despite presentation of higher grade and more poorly differentiated breast carcinoma in the younger group of Chinese women, the overall and disease-free survivals were similar to their older counterparts.
Breast Cancer Treatment Choices in Hong Kong Chinese Women

Dacita Suen¹, Ling Wong¹, Ava Kwong²

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Introduction: Survival following early-stage breast cancer is comparable for women treated with breast conserving surgery (BCS) and those with mastectomy. However, women of Chinese origin have been found to have a higher rate of mastectomies instead of BCS. In a previous retrospective review of BCS in Hong Kong Chinese women, we found the rate of BCS is low (21.9%) as compared to that of Western countries. An in-depth qualitative interview study was conducted which aims to examine the influence of clinical, socio-cultural, co–decision making, provider communication, and other factors on treatment decision-making processes.

Methods: Patients with early-stage breast cancer completed surgical treatment in a university hospital were randomly selected in the study. A one-to-one, tape-recorded, in-depth, semistructured interview was conducted with each patient. A questionnaire with 4 dimensions of social concern was developed; these dimensions were self-image and sexuality, survival and cure concerns, concerns on subsequent treatments, and role of family or friends.

Results: Eighteen patients with early breast cancer were recruited into the study. Eight patients had mastectomy, 7 had breast conservation, and 2 had mastectomy followed by reconstruction. Age and stage of the disease were comparable among these 3 groups of patients. Survival and cure concerns were significantly more important than the other dimensions in treatment decision-making processes (P < 0.000). Patients choosing breast conservation and breast reconstruction placed more emphasis on self-image and sexuality concerns (P = 0.032) than patients who chose mastectomy. Surgeons’ recommendation on the treatment was also a significant factor influencing treatment choice in patients with breast conservation (P = 0.042).

Conclusions: Rate of breast conservation is low among Chinese women. Surgeons’ recommendation, especially with emphasis on survival and cure concerns, may help to encourage more Chinese patients to choose breast conservation.
A Pilot Survey of the Quality of Breast Cancer Care Provided by Surgeons

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Introduction: There is a need for surgeons to participate in national forums which define the quality of breast cancer care.

Methods: A questionnaire was developed to analyze potential quality measures (QM) that included Part A, questions (51) on surgeons’ processes used in the care of their patients, and Part B, questions (123) related to medical management of their breast cancer patients. Participation was offered to the American Society of Breast Surgeons (ASBS) board and members of the ASBS Quality & Safety Committee. Affiliation % includes academic (29%); hospital-based (29); solo (12); multispecialty (24); single specialty (24); integrated health systems (12). Data was submitted electronically through a protected website and each surgeon was de-identified.

Results: A total of 18 surgeons participated and submitted data on 362 breast cancer patients (maximum of 20 patients each) for whom they were the primary surgeon. PART A: Quality Process (% of Surgeons): Can track recurrences (35%); Have nurses with specialty training (94%); Offer clinical trials (82%); Triage to expedite newly diagnosed (100%); Educational resources (100%); Patient satisfaction survey used (58%). PART B: Quality Measure (Results): Time (T) from appt. to cancer diagnosis {if by surgeon} (X = 9 days); T from surgical appt. to surgery (X = 30 days); T from diagnosis to surgical appt. (X = 6 days); T from surgery to notification of pathology results (X = 7 days); Surgeon performed the diagnostic biopsy (43%); If surgical delay, reason was patient schedule (64%); MRI performed (50%); Documented discussion of breast conservation (97%); Specimen orientation (95%); Sentinel node identification (97%); Axillary basin count post sentinel node documented (98%); Complication rate (12%); Enrolled in clinical trial (28%); Preop and postop photograph (21%). Other data obtained includes: methods of localization, margin assessment, reconstruction, re-resection rates, and multidisciplinary tumor board use.

Conclusion: Breast surgeons are willing to participate in QM projects which document and prioritize high quality processes of care. Performance metrics were also able to be captured for 362 patients in 3 months. This rate of information accrual exceeds that of many clinical trials and suggests that broader participation could (1) provide information for benchmarking, (2) identify “best” practices and processes, and (3) discover problem areas for improvement initiatives.
Characterization of Adipose-Derived Stem Cells in the Stroma of Breast Tissue From Normal and Cancer Patients


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It has been postulated that stem cells derived from malignant breast tumours may play a role in the pathogenesis of breast cancer. The role of the mesenchymal stem cell (MSC) in the adipose tissue and stroma of the breast remains to be defined. The aim of this initial research is to optimize the methods for isolation and characterization of human adipose–derived adult progenitor (stem) cells from the adipose tissue and stroma of breast specimens.

Biopsies of breast tissue from women without premalignant or malignant breast disease were obtained under sterile conditions. The tissue was mechanically minced, subjected to collagenase digestion, centrifugation and a (adherent) cell culture was initiated with the resulting cell pellet. We have termed the cultured cells adipose-derived mesenchymal stem cells (Ad-MSCs).

Ad-MSCs were characterized by a variety of methods, namely flow cytometry to elucidate their surface phenotype, growth kinetics, eg, by computing population doublings (and doubling times) in serially passaged samples, as well as potential cell yields obtainable from these samples. A global examination of secreted factors of Ad-MSCs was performed by means of a cytokine array analysis. Additionally, Ad-MSCs were induced to differentiate along 4 lineages in appropriate induction media and at the end of the induction period, assessed for lineage-specific markers. Our results demonstrated that within the stroma of breast tissue, there exist a population of MSCs which resembled bone marrow–derived MSCs in terms of surface antigen expressions and was capable of differentiating toward at least 4 mesodermal-derived lineages, namely the adipogenic, myogenic, osteogenic, and chondrogenic lineages.

Human Ad-MSCs have been successfully isolated from breast tissue and relatively easily culture-expanded. This initial research will provide seed cells for further research into the potential role(s) of mesenchymal stem cells within the breast stroma and aid in shedding light on the etiology of breast disease.
Sclerotherapy for the Treatment of Postmastectomy Seroma

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**Background:** Seroma is the most common complication after mastectomy, resulting in potential discomfort, infection, and delay in adjuvant therapy. Treatment options include serial aspiration, drain replacement, and capsulectomy. Other chronic fluid collections, such as pelvic lymphoceles, have been successfully treated with sclerotherapy. We review our experience with sclerotherapy for the management of postmastectomy seromas.

**Materials and Methods:** Criteria for sclerotherapy were prolonged drainage, high-volume seroma aspiration, or repeated aspirations. Records were reviewed to evaluate method, timing, and outcomes of sclerotherapy for postmastectomy seromas. Ninety-five percent ethyl alcohol or dilute povidone-iodine via percutaneous catheter was used as the initial sclerosant with a dwell time of 20-30 minutes. Patients were then instructed to instill povidone-iodine solution via the catheter for 20-30 minutes 2-3 times daily at home. Catheters were removed when output was less than 30 ml/day or cavity size less than 20 ml by sinogram.

**Results:** Fifteen patients (16 seromas) were reviewed. Mean BMI was 33 (range, 22-59). Eleven patients received neoadjuvant chemotherapy or prior ipsilateral radiation. The mean number of sclerotherapy treatments was 2.7 (range, 1-4) at 5-7 day intervals with a total treatment duration averaging 19 days (range, 6-41). Treatment was initiated at a median of 35 days after surgery (range, 13-232). Five of 10 patients who did not receive prophylactic antibiotics developed infection compared to 1 of 5 patients who received prophylactic antibiotics. Patients who did not develop infection had their catheters removed after 12 days compared to 21.5 days in patients with infection ($P = 0.02$). One seroma recurred which was successfully treated with a single aspiration.

**Discussion:** Sclerotherapy with ethyl alcohol and/or povidone-iodine is a feasible treatment for chronic seroma after mastectomy. Infection risk is high but may be reduced with prophylactic antibiotics. Further research is needed to determine optimal sclerotherapy regimens and whether sclerotherapy is superior to other treatment options.
Utility of Breast MRI in Early Detection of Breast Cancer in Patients With LCIS

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Introduction: To evaluate the use of MRI as a screening tool for early detection of breast cancer for population of patients with diagnosis of LCIS and negative mammographic findings.

Methods: The study was performed as a retrospective analysis of reports from 28 patients with a known tissue diagnosis of LCIS who underwent regular screening surveillance with bilateral breast MRI. Patients were included in the study group if they had a tissue diagnosis of LCIS and screening with both conventional mammography and bilateral breast MRI within 3 months of each other.

Results: (n = 28) patients were included in the study group. No member of the study group had an abnormality detected by conventional mammography. Ten patients had abnormal findings on MRI which were subsequently biopsied. Seven of 10 patients biopsied were found to have malignancy, with 3 of the 10 returning benign pathology.

Discussion: Breast MRI is rapidly evolving as an adjunct to conventional mammography and shows promise for earlier detection of breast cancer in high risk populations. In our study group of women with a known diagnosis of LCIS, cancer was detected in 25% (7/28) of the patients in advance of any conventional mammographic findings with only 11% (3/28) receiving an additional biopsy for benign pathology.
Improvement in Sentinel Node Biopsy in a Teaching Community Hospital: Results of a Multidisciplinary Program

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Introduction: In 2000, a multidisciplinary team was created in our institution to improve care of breast cancer patients. We presented data in 2001 showing that our performance with sentinel node biopsy (SNB) was inadequate. The identification rate for the sentinel node (SN) was only 73% and the false-negative rate was 10%. Several surgeons were performing SNB without training or validation. Against the objections of a very vocal minority of surgeons, the multidisciplinary group created a set of reasonable standards for SNB, including (1) limiting SNB, initially, to several trained surgeons, (2) requiring attendance at breast conference, (3) proctoring by the “trained” surgeons, and (4) monitoring of results. We changed the methodology in nuclear medicine to include subareolar injection. This paper shows our performance for a 2-year period beginning January 2004.

Methods: Specific outcome measures: (1) identification of SN, (2) percent positive for each size grouping (compared with SEER data). False-negative rates were not possible since full axillary dissection was omitted when the SN was negative.

Results: The SN identification rate was 94% ($P < 0.001$, compared with 2001). Positivity was comparable to the SEER data T1a 0% versus 8%, T1b 16.7% vs. 13.3%, T1c 25.9% vs. 28.5%. T2 – average size = 2.7 cm - 40% versus 41%. Two surgeons continue to have poor identification rates (73%, 81%), and there are marked differences in the mean number of nodes harvested per surgeon (average range, 1-2.6) with a tendency for higher nodal positivity for those surgeons harvesting more nodes.

Discussion: A multidisciplinary program can improve care despite strong objections of underperforming surgeons. Additional improvement is needed. An action plan will be formulated through our previously developed mechanism.
Transaxillary Retromammary Route Approach of Video-Assisted Breast Surgery Enable the Inner-Side Breast Cancer to Be Resected for Breast-Conserving Surgery

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Introduction: The endoscopic surgery for inner-side breast cancer is usually performed by periareolar approach, but it often makes deformation or malposition of nipple and areola, and sensory disturbance around them. The transaxillary approach is favorable without making any injuries on breast skin. But we cannot treat distant cancers from the axilla, such as inner-side or caudal-side cancer. Therefore, we devised a new approach of retromammary route without subcutaneous exfoliation, from axillary skin incision, to treat distant cancers and also to preserve skin touch sensation.

Methods: We have performed video-assisted breast surgery (VABS) on 230 patients since December 2001. The newly devised transaxillary retromammary route approach (TARM) was performed on 20 patients of early breast cancer, stages I and II. After endoscopic sentinel lymph node biopsy, we elongated the axillary skin incision to 2.5 cm. We marked the surgical margin 2-cm apart from the tumor edge by injecting blue dye into subcutane and retromamma. We dissected major pectoral muscle fascia to detach retromammary tissue under the tumor. The working space was made by lifting traction sutures through the gland. We cut the proximal side of the gland vertically at dye marking points, and dissect skin flap over the tumor by tunnel method. Then we cut each sides of the gland vertically and removed it through the axillary port by using the Endocatch tumor collection bag. The breast reconstruction was done by filling absorbable fiber cotton.

Results: Traction sutures made it easier to cut the mammary gland vertically. We did not experience any skin damages like burn. All surgical margins were negative. The operation time was needed 45 minutes longer than the conventional VABS operation, but the blood loss and other surgical stress factors were not significantly different. The postoperative esthetic results were good. The sensory disturbance was minimal. All patients were satisfied with this operation.

Discussion: This newly devised TARM approach need no injury on whole breast, and can become a single standard method for breast-conserving surgery wherever a cancer is situated.
Predictors and Outcomes of Contralateral Prophylactic Mastectomy

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Objective: Women with unilateral breast carcinoma are at increased risk for developing contralateral breast carcinoma (CBC). The purpose of this study was to identify predictors of malignant histologic findings in contralateral prophylactic mastectomy (CPM) specimens, and to determine the efficacy of CPM.

Methods: The authors performed a retrospective review of patients with unilateral breast carcinoma who underwent CPM at our center from January 2000 to April 2007. Patients were included in the study if they met the following additional criteria: (1) unilateral primary breast carcinoma, and (2) no significant clinical or radiographic findings in the contralateral breast. Patients known preoperatively to have bilateral breast carcinoma will be excluded from the analysis. A total of 542 patients were included in the study.

Results: In the current study, 27 patients (5%) had occult contralateral malignancies (8 invasive carcinomas and 19 ductal carcinomas in situ). At median 32.7 months of follow-up, none of patients developed a new CBC. Univariate analysis revealed the predictors of contralateral malignancies: invasive lobular histology (odds ratio [OR], 2.9; \( P = 0.01 \)), additional ipsilateral moderate to high-risk pathology (OR, 4.6; \( P < 0.0001 \)), age ≥ 50 years at cancer diagnosis (OR, 2.8; \( P = 0.01 \)), multicentric index tumor (OR, 3.1; \( P = 0.01 \)), and higher Gail risk (OR, 3.9; \( P = 0.001 \)). Multivariate analysis revealed 3 independent predictors of contralateral malignancies: invasive lobular histology (OR, 3.1; \( P = 0.01 \)), multicentric index tumor (OR, 3.8; \( P = 0.002 \)), and higher Gail risk (OR, 3.6; \( P = 0.01 \)).

Conclusions: CPM was associated with a low risk of subsequent development of breast carcinoma. Evaluation of histologic findings in the ipsilateral breast may help to predict the likelihood of significant disease in the contralateral breast and assist in risk stratification.
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