

BRS-MOA

**Breast Monday Poster Discussions**

Monday, Nov. 28 12:15PM - 12:45PM Room: BR Community, Learning Center

**BR**

AMA PRA Category 1 Credit™: .50

**FDA**

Discussions may include off-label uses.

Lilian Wang, MD, Chicago, IL (*Moderator*) Nothing to Disclose**Sub-Events****BR226-SD-MOA1 Value of Preoperative Axillary US for Preventing Unnecessary axillary Lymph Node Dissection in a Large Series of Patients with Early-Stage Breast Cancers**

Station #1

Ga Ram Kim, MD, Incheon, Korea, Republic Of (*Abstract Co-Author*) Nothing to DiscloseJi Soo Choi, MD, PhD, Seoul, Korea, Republic Of (*Presenter*) Nothing to DiscloseBoo-Kyung Han, MD, PhD, Seoul, Korea, Republic Of (*Abstract Co-Author*) Nothing to DiscloseEun Young Ko, MD, PhD, Seoul, Korea, Republic Of (*Abstract Co-Author*) Nothing to DiscloseEun Sook Ko, MD, Seoul, Korea, Republic Of (*Abstract Co-Author*) Nothing to Disclose**PURPOSE**

To investigate value of preoperative axillary ultrasound (US) for preventing unnecessary axillary lymph node dissection (ALND) in a large series of patients with early-stage breast cancers.

**METHOD AND MATERIALS**

From March 2009 to February 2013, 1929 patients who had undergone preoperative axillary US and subsequent breast conserving surgery for clinically node negative T1/T2 breast cancers were included as follows: 1475 (76.5%) with negative sentinel lymph node biopsy (SLNB) and stability on follow-up for more than 2 years, 327 (17.0%) with positive SLNB and subsequent ALND, 127 (6.6%) with positive US-guided fine-needle aspiration result of axillary LN and subsequent ALND. Preoperative axillary US results (positive or negative) and clinicopathologic features (age, clinical T stage, histologic type, nuclear grade, lymphovascular invasion, and molecular subtypes) were compared according to the presence of non-SLN metastasis. Multivariate logistic regression was performed to find independent factors for non-SLN metastasis.

**RESULTS**

Of 1929, 203 (10.5%) patients had non-SLN metastasis in their ALNDs. Patients with ultrasonographically positive axilla showed non-SLN metastasis more frequently than patients with ultrasonographically negative axilla (53.8% versus 3.6%,  $P < 0.001$ ). At multivariate analysis, the independent factors associated with non-SLN metastasis were ultrasonographically positive axilla (odds ratio [OR], 30.163; 95% confidential interval [CI], 19.970-45.558), clinical T2 stage (OR, 1.733; CI, 1.156-2.598) and lymphovascular invasion (OR, 5.922; CI, 3.971-8.832). In our 1284 patients who had clinical T1 cancers and ultrasonographically negative axilla, 185 (14.4%, 184 of 1284) underwent ALND, and non-SLN metastasis was confirmed in 30 patients (2.3%, 30 of 1284).

**CONCLUSION**

In early-stage breast cancer patients, positive axilla and clinical T2 stage determined by preoperative staging US were significantly associated with non-SLN metastasis. This study suggests that ALND can be avoided for patients with ultrasonographically negative axilla and clinical T1 stage cancers with a minimal risk of non-SLN metastasis.

**CLINICAL RELEVANCE/APPLICATION**

Axillary lymph node dissection might be avoided for patients with negative axilla and clinical T1 stage determined by preoperative US with a minimal risk of non-sentinel lymph node metastasis.

**BR227-SD-MOA2 Follow-up of Patients Undergoing Oncoplastic Surgery- More Palpable Masses and Benign Biopsies**

Station #2

Yoav Amitai, MD, Tel Aviv, Israel (*Presenter*) Nothing to DiscloseOrit Golan, MD, PHD, Tel-Aviv, Israel (*Abstract Co-Author*) Nothing to DiscloseYoav Barnea, Tel Aviv, Israel (*Abstract Co-Author*) Nothing to DiscloseTehillah Menes, MD, Tel Aviv, Israel (*Abstract Co-Author*) Nothing to Disclose**PURPOSE**

Oncoplastic surgery is increasingly being used in the management of women undergoing breast conserving surgery. Data on the impact of oncoplastic surgery on the follow-up of these women is lacking. We hypothesized that the combined surgery may make post-operative surveillance more difficult, mainly due to breast parenchymal rearrangement. The goal of this study was to compare the post-operative follow up of patients who underwent breast conserving surgery with and without plastic reconstruction.

**METHOD AND MATERIALS**

All patients undergoing breast conserving surgery with oncoplastic reconstruction in our institution between 2009-2014 were included in the study. For each patient in the oncoplastic reconstruction group, the first 4 patients who underwent lumpectomy alone in the same week were selected and included in the control arm. The two groups were compared regarding demographics,

tumor characteristics, details of the surgery, post-operative patient complaints, breast exam, imaging findings and subsequent biopsies done during follow-up.

## RESULTS

The study group included 72 women who had oncoplastic surgery and 291 who underwent breast conserving surgery without oncoplastic surgery. Mean follow up was similar (888 vs. 932;  $p=0.5$ ). Patients undergoing oncoplastic surgery were younger (49 vs. 57 years;  $P=0.015$ ), had more advanced disease (Average tumor size 1.9 vs. 1.6 cm;  $p=0.02$ , Involved lymph nodes 41% vs. 17%;  $P<0.001$ ) and more often had undergone neoadjuvant treatment (35% vs. 8%;  $P<0.001$ ). Larger volumes of tissue were removed in the oncoplastic group (388 cm<sup>3</sup> vs. 123 cm<sup>3</sup>,  $P<0.001$ ). New lumps on physical examination were more frequently found in patients after oncoplastic surgery (22% vs. 5%;  $P<0.001$ ). Patients after oncoplastic surgery had more biopsies during follow-up (30% vs. 14%;  $P<0.001$ ). This finding remained significant after controlling for age, use of neoadjuvant treatment and volume of tissue removed. Ninety percent of biopsies in the oncoplastic group were benign, most commonly fat necrosis (63%).

## CONCLUSION

Oncoplastic surgery is followed by higher rates of palpable findings and subsequent breast biopsies compared to lumpectomy alone. Most biopsies are benign, most commonly fat necrosis.

## CLINICAL RELEVANCE/APPLICATION

Women and their physicians should be aware of the higher rate of palpable abnormalities and breast biopsies after oncoplastic surgery, and more importantly of its benign nature.

## BR228-SD- MOA3 Impact of Imaging Features and Neoadjuvant Chemotherapy on Breast Intraoperative Specimen Interpretation

Station #3

### Awards

#### Student Travel Stipend Award

Bryan Jordan, MD, Houston, TX (*Presenter*) Nothing to Disclose  
Wei Wei, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Mark J. Dryden, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Alejandro Contreras, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Kelly K. Hunt, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Basak E. Dogan, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose

### PURPOSE

To investigate the influence of imaging features and history of neoadjuvant therapy (NAC) on the accuracy of intraoperative specimen radiography (IOSR) evaluation of histopathological margin status in breast cancer patients.

## METHOD AND MATERIALS

We retrospectively reviewed electronic health records of consecutive patients with invasive carcinoma who underwent specimen radiography at the time of their definitive surgery from July 2014-February 2015 at our institution in an IRB approved study. Patient demographics, type of surgery, and tumor histopathological type (with or without associated DCIS), history of NAC and clinical NAC response, initial IOSR assessment, need for intraoperative additional tissue, re-excision surgery and mastectomy rates were recorded. History of NAC prior to surgical excision were compared with IOSR interpretation findings and final pathological margin [close or positive margins (CPM) versus negative margins (NM)] status.

## RESULTS

Our eligibility criteria was met by 625 patients. Median patient age was 56 (range 28-87) years. At presentation, 223(52.5%) patients had pure invasive, 271(46%) had invasive and in situ cancer, and 131(3%) were of other subtypes. 514(82.2%) cancers were unifocal, 106(17.8%) were multifocal or centric. 300(48%) underwent mastectomy and 325(52%) segmental mastectomy. A total of 226 (36%) patients underwent NAC and 399 (63%) upfront surgery. IOSR indicated CPM in 232 (37.1%), prompting excision of additional tissue, while final pathology showed CPM in 29.7%. Sensitivity, specificity, PPV, and NPV, and accuracy of IOSR in predicting CPM were, 94%, 86.8%, 75.4%, 97.1%, 89%, respectively (95% CI: 86-91%). CPM was significantly lower in the NAC group (21%) than non NAC group (35%) ( $p = 0.0002$ ). While sensitivity (93.6 vs 94.1%), specificity (86.4 vs 87.6%) and NPV (98.0 vs 96.4%) of IOSR were similar in NAC vs non NAC groups, false positive rate was higher in NAC (35%) vs non NAC(19.5%) and PPV was lower in the NAC (64.7%) compared to non NAC(80.5%) group.

## CONCLUSION

IOSR is a highly accurate method of intraoperative specimen margin evaluation. While preoperative NAC increases the rate of negative surgical margins, it increases false positive rate and decreases PPV of IOSR.

## CLINICAL RELEVANCE/APPLICATION

While NAC history decreases the probability of CPM, it influences IOSR evaluation of surgical margins and may contribute to an increase in excision volume.

## BR229-SD- MOA4 Long-term Survival Outcomes of Primary Breast Cancer in Women with or without Preoperative MR Imaging: A Matched Cohort Study

Station #4

Ga Young Yoon, Seoul, Korea, Republic Of (*Presenter*) Nothing to Disclose  
Woo Jung Choi, MD, Seoul, Korea, Republic Of (*Abstract Co-Author*) Nothing to Disclose  
Joo Hee Cha, MD, Seoul, Korea, Republic Of (*Abstract Co-Author*) Nothing to Disclose  
Hwa Jung Kim, Seoul, Korea, Republic Of (*Abstract Co-Author*) Nothing to Disclose  
Hak Hee Kim, MD, Seoul, Korea, Republic Of (*Abstract Co-Author*) Nothing to Disclose  
Hee Jung Shin, MD, Seoul, Korea, Republic Of (*Abstract Co-Author*) Nothing to Disclose  
Eun Young Chae, Seoul, Korea, Republic Of (*Abstract Co-Author*) Nothing to Disclose

### PURPOSE

To investigate whether preoperative magnetic resonance (MR) imaging use in patients with primary breast cancer are predictive of

to investigate whether preoperative magnetic resonance (MR) imaging use in patients with primary breast cancer are predictive of disease-free (DFS) and overall (OS) survival.

## METHOD AND MATERIALS

From 2009 to 2010, 875 women with primary breast cancer who undergone preoperative MR imaging were matched with 1635 women without preoperative MR imaging. The patients were matched with regard to age at diagnosis, address, job, parenchymal pattern of mammography, operation date, hormone receptor status, Ki-67 status and molecular subtype. Cox proportional hazards model was used to investigate time to recurrence and to estimate the hazard ratio (HR) for preoperative MR imaging.

## RESULTS

A total of 759 matched-pairs were available for survival analysis. There were 143 recurrence; 65 locoregional recurrence, 23 contralateral breast cancer, and 55 distant recurrence. There were 40 deaths. The MR imaging group had a tendency toward better distant recurrence DFS (HR, 0.67; 95% confidence interval; 0.39, 1.14;  $P = .138$ ) than did the no MR imaging group. However, no difference was found for locoregional recurrence ( $P = .893$ ), contralateral breast cancer ( $P = .839$ ) DFS or OS ( $P = .504$ ).

## CONCLUSION

Preoperative breast MR imaging for primary breast cancer was associated with a reduced risk of distant recurrence; however, no observed reduction in risk of locoregional, contralateral breast cancer or overall survival was shown.

## CLINICAL RELEVANCE/APPLICATION

The use of a breast MR imaging at the time of initial diagnosis and evaluation of primary breast cancer may help reduce risk of distant recurrence.

## BR230-SD- Computer-aided Detection (CAD) for Synthesized Mammography: Does it Perform the Same as CAD for Full-field Digital Mammography? MOA5

Station #5

Rosalind P. Candelaria, MD, Houston, TX (*Presenter*) Nothing to Disclose  
William R. Geiser, MS, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Monica L. Huang, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Roland Bassett Jr, Houston, TX (*Abstract Co-Author*) Research Grant, Lantheus Medical Imaging, Inc  
Deanna L. Lane, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Lumarie Santiago, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Marion E. Scoggins, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Elsa M. Arribas, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose  
Beatriz E. Adrada, MD, Houston, TX (*Abstract Co-Author*) Nothing to Disclose

## PURPOSE

To compare the performance of computer-aided detection (CAD) in synthesized mammography (SM) to CAD in full-field digital mammogram (FFDM) in the same screening patients

## METHOD AND MATERIALS

An IRB-approved retrospective review of all screening mammograms performed during a two-month period from 12/2015 through 2/2016 at one academic institution was completed. Patients were included if their screening examination was comprised of FFDM, digital breast tomosynthesis (DBT) and SM. All studies were acquired with a Selenia Dimensions platform (Hologic). The synthesized 2D images were obtained using C-view, the 2D image reconstruction algorithm developed by Hologic. ImageChecker CAD settings (Hologic Cenova platform) were optimized in accordance with manufacturer recommendations. The number and types of lesions detected by SM CAD and FFDM CAD were recorded and compared. Paired differences between modalities were made using the Wilcoxon signed-rank test. All statistical tests used a significance level of 5%.

## RESULTS

380 out of 1453 patients who had screening mammograms performed during the study timeframe met inclusion criteria. Median patient age was 59 years, range 31-90 years. A significantly greater number of masses were detected by SM CAD than by FFDM CAD ( $p < 0.0001$ ). There was no significant difference in the number of calcifications detected by SM CAD and FFDM CAD ( $p = 0.4408$ ). There was a greater number of MALCs (masses plus calcifications) detected by SM CAD than by FFDM CAD ( $p = 0.0168$ ). Overall, a greater total number of lesions was detected by SM CAD than by FFDM CAD ( $p = 0.0117$ ).

## CONCLUSION

There is a statistically significant difference in the performance of CAD in identifying masses and MALCs on SM compared to FFDM. However, CAD performance was not significantly different in identifying calcifications between the two modalities.

## CLINICAL RELEVANCE/APPLICATION

Radiologists who utilize CAD, which is intended to reduce false negatives by marking suspicious areas on mammograms for consideration, should judiciously recognize the differential performance of CAD between SD and FFDM.

## BR231-SD- Pilot Reader Study of Concurrent CAD for Digital Breast Tomosynthesis MOA6

Station #6

Corinne Baileyguier, MD, PhD, Villejuif, France (*Presenter*) Nothing to Disclose  
Julia Arfi Rouche, Maisons-Alfort, France (*Abstract Co-Author*) Nothing to Disclose  
Laurent Levy, MD, Paris, France (*Abstract Co-Author*) Nothing to Disclose  
Patrick R. Toubiana, MD, Paris, France (*Abstract Co-Author*) Nothing to Disclose  
Franck Cohen-Scali, MD, Neuilly Sur Seine, France (*Abstract Co-Author*) Nothing to Disclose  
Alicia Toledano, DSc, Kensington, MD (*Abstract Co-Author*) Consultant, iCAD, Inc  
Senthil Periaswamy, PhD, Nashua, NH (*Abstract Co-Author*) Director of Research, iCAD, Inc  
Jonathan Go, Nashua, NH (*Abstract Co-Author*) Sr. Vice President, iCAD, Inc  
Jeffrey W. Hoffmeister, MD, Nashua, NH (*Abstract Co-Author*) Employee, iCAD, Inc; Stockholder, iCAD, Inc  
Bruno Boyer, MD, Saint-Mande, France (*Abstract Co-Author*) Nothing to Disclose

## PURPOSE

To evaluate the concurrent use of a Computer-Aided Detection (CAD) system with Digital Breast Tomosynthesis (DBT). To obtain performance estimate information for use in designing and computing the sample size (number of readers and cases) to adequately power a pivotal reader study.

## **METHOD AND MATERIALS**

6 radiologists read an enriched sample of 80 DBT cases, with 21 cancer cases and 23 malignant lesions with a crossover design with and without CAD. All readers reviewed all cases in 2 visits separated by a period of at least 4 weeks. The CAD system detects and extracts suspicious masses, architectural distortions and asymmetries from 3D DBT planes and blends them into the corresponding 2D synthetic image. With CAD, the radiologist views the lesion on 2D projection then navigates directly to the tomosynthesis plane for characterization. Area Under the Receiver Operating Characteristic (ROC) Curve (AUC) was used to compare the two readings in terms of cancer detection. Sensitivity, specificity, recall rate and reading time were also assessed. The magnitude, direction of differences between AUCs and reading time for with and without CAD and correlations that influence sample sizes for the pivotal study were obtained from the pilot study.

## **RESULTS**

Average AUC across readers without CAD was 0.854 and 0.850 with CAD (-0.046, 0.039, 95% CI). Time reduction of reading time with CAD was statistically significant with average improvement in reading time of 23.5% (7.0 to 37.0%, 95% CI). No statistically significant differences in radiologist sensitivity, specificity or recall rate for non-cancers when reading concurrently with CAD vs. without CAD was found. Using parameter estimates obtained from the pilot study, sample size calculation determined that a pivotal reader study with 20 readers, 60 cancers, and 180 non-cancers provides estimated power of 90% for demonstrating non-inferior AUC and estimated power of 93% for demonstrating superior radiologist reading time.

## **CONCLUSION**

Concurrent use of CAD results in a 23.5% faster reading time with non-inferiority of radiologist performance compared to reading without CAD. A pivotal reader study with 20 readers, 60 cancers, and 180 non-cancers is planned to more robustly evaluate these endpoints.

## **CLINICAL RELEVANCE/APPLICATION**

Concurrent use of CAD maintains high performance of DBT with a significant reduction in reading time thus improving workflow even for very experienced radiologists.

## **BR128-ED- Spectrum of Axillary Hyperdense Masses and Foci MOA7**

Station #7

Jaclyn Thiessen, MD, Portland, OR (*Presenter*) Nothing to Disclose  
Phillip A. Setran, MD, Portland, OR (*Abstract Co-Author*) Nothing to Disclose  
Karen Y. Oh, MD, Portland, OR (*Abstract Co-Author*) Nothing to Disclose  
Mark D. Kettler, MD, Portland, OR (*Abstract Co-Author*) Nothing to Disclose

### **TEACHING POINTS**

Axillary hyperdense foci visible on mammography are caused by a variety of malignant, benign and iatrogenic conditions. In the setting of breast cancer, calcifications in axillary lymph nodes may, but do not necessarily reflect metastatic disease. Knowledge of benign and iatrogenic patterns of axillary hyperdense foci can obviate unnecessary additional imaging and biopsies.

## **TABLE OF CONTENTS/OUTLINE**

Definition: Axillary hyperdense foci include calcifications and/or metallic densities within axillary lymph nodes or masses/foci denser than normal axillary tissue. Axillary lymph node calcifications caused by metastatic disease Invasive breast cancer and DCIS metastases Psammomatous calcifications associated with metastatic thyroid and ovarian cancer Axillary lymph node calcifications caused by systemic disease Sarcoidosis Granulomatous diseases Axillary lymph nodes containing metal opacities Gold salt therapy for rheumatoid arthritis Tattoo pigment Hyperdense axillary lymph nodes associated with hematologic disorders such as leukemia and lymphoma Other/Iatrogenic causes of axillary hyperdensities Dermatomyositis Talc emboli Calcified oil cyst Catheter fragment Free silicone/silicone granuloma Surgical clip Deodorant artifact

## **BR178-ED- Breast Imaging in the Transgender Patient: Traversing New Terrain MOA8**

Station #8

### **Awards**

#### **Certificate of Merit**

Bianca M. Carpentier, MD, San Francisco, CA (*Presenter*) Nothing to Disclose  
Jessica H. Hayward, MD, San Francisco, CA (*Abstract Co-Author*) Nothing to Disclose  
Katharine D. Maglione, MD, New York, NY (*Abstract Co-Author*) Nothing to Disclose  
Loretta M. Strachowski, MD, San Francisco, CA (*Abstract Co-Author*) Nothing to Disclose

### **TEACHING POINTS**

The purpose of this exhibit is to provide the reader with an approach to breast imaging in the transgender patient. After viewing this presentation, the reader will gain a better understanding of the appropriate terminology to use with transgender patients who may present for screening or diagnostic breast evaluation. Surgical and hormonal treatments most commonly used in gender reassignment, including both male-to-female (MTF) and female-to-male (FTM) patients, will be reviewed, as well as the resultant expected imaging features on mammography, ultrasound and MRI. This exhibit will also cover the known breast cancer risk in the transgender population with examples of malignancy. The reader will be provided with current screening recommendations of this population, as well as the current screening controversies.

## **TABLE OF CONTENTS/OUTLINE**

-Terminology to use with transgender patients-Current therapy and resultant physiological changes-Imaging features post therapy-Breast cancer risk with gender reassigned patients-Current screening recommendations and controversies-Reimbursement in the US for the asymptomatic transgender screening patient-How to create a sensitive, welcoming environment in your practice-Our institution's approach for both screening and diagnostic evaluation in transgender patients