carcinoma (ILC). Patients were required to have negative surgical margins. Adjuvant hormonal therapy or chemotherapy (CT) was allowed. RT consisted of 35 Gy delivered in 7 daily fractions, 5 Gy/fraction. Treatment volumes and RT planning were based on RTOG 0413 guidelines. A "field-in-field" 3D-conformal RT technique was used. Daily orthogonal AP and lateral kV images were taken before each fraction and compared with the DRRs, using 3 fiducial markers placed in the tumor bed at the time of surgery as reference. PTV margin was than reduced to 5 mm. Toxicity was evaluated by CTCAV, v3.0. Follow-up visits occurred 1, 3, 6 and 12 months from for the first year, and then once a year. DVHs were generated for all relevant structures. Dosimetric parameters from the subgroups with and without Grade $\geq$ 2 fibrosis were compared using a two-tailed Student's t test; statistical significance was claimed for $p < 0.05$. The mean Grade $\geq$ 2 fibrosis predicted by our NTCP model was of 2.7% (range, 0-.8%-7.2%).

Results: Sixty-six patients were enrolled. The mean age was 69 years (range, 61-80 years); the majority (90%) had a PS of 0-1. Sixty-two had an IDC, and 2 an ILC; the mean tumor dimension was 10 mm (range, 4-25 mm). Two patients received adjuvant CT. The median follow-up was 15 months (range, 11-30 months), and therefore all patients were assessable for late toxicity. The proposed fractionation scheme was very well tolerated. Grade $\geq$2 fibrosis was observed only in 5 (7%) patients. This result is within the range predicted by our NTCP model (95% CI = 0.6%-7.2%). One patient reported Grade 2 pain in the irradiated volume; 2 (3%) experienced Grade 2 erythema. No Grade 3 toxicity was documented. No statistical correlation between dosimetric parameters and toxicity was found.

Conclusions: APBI delivered in 35 Gy in 7 daily fractions was well tolerated. The incidence of severe fibrosis correlates well with that predicted by our NTCP model.

Author Disclosure: **M. Trovo:** None. **M. Avanzo:** None. **M. Roncadin:** None. **J. Stancanello:** None. **E. Micheli:** None. **S. Massarut:** None. **E. Capra:** None. **M.G. Trovo:** None.

2009

Male Breast Cancer Prognostic Factors: Similarity to Female Counterparts With Propensity Scores and Matched-Pair Analysis

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Purpose/Objective(s): To assess the effect of prognostic factors and their impact on survival in male and female breast cancer.

Materials/Methods: Charts for men and women diagnosed with breast cancer referred to cancer center for treatment were reviewed. Patients with distant metastatic diseases were excluded. Data on prognostic factors including age, nodal status, resection margin, use of hormonal therapy, chemotherapy with/without hormone and radiation therapy (RT), survival and recurrence were analyzed. Survival estimates were obtained using Kaplan-Meier methodology. The Cox regression interaction was used to compare male and female differences in prognostic factors. Male breast cancer (MBC) and female breast cancer (FBC) were matched 1:3 ratios according to propensity scores and survival compared using Cox regression.

Results: From 1963-2006 there were 75 MBC and 1313 FBC totaling 1388 breast cancers. Median age of the cohort was 53 (range: 23-90) years. Median follow-up was 90 (range: 0.4-339) months. Of the prognostic factors considered nodal status had a significant Cox regression interaction. For overall survival (OS) $p = 0.001$ with hazard ratios (HRs) of 0.83 (95% CI = 0.42-1.64) and 2.88 (95% CI = 2.36-3.52) for male and females, respectively. For cause specific survival (CSS) $p = 0.041$ with HRs of 1.22 (95% CI = 0.45-3.27) and 3.52 (95% CI = 2.76-4.48) for males and females, respectively. Among node positive patients, distant disease recurrence free survival (DDRFS) was worse (log rank, $p < 0.001$) with MBC. When MBC and FBC were matched (1:3) by propensity scores differences between MBC and FBC were observed in OS (HR = 1.94, 95% CI = 1.18-3.19, $p = 0.009$) and DDRFS (HR = 2.79, 95% CI = 1.36-5.75, $p = 0.005$).

Conclusions: This large series showed that MBC and FBC survivals are not similar, and the nodal status influences survival differently in MBC and FBC. The findings of this study need confirmation from a more complete prospective database.

Author Disclosure: **E. Yu:** None. **L. Stitt:** None. **O. Vujovic:** None. **K. Joseph:** None. **A. Assouline:** None. **J. Au:** None. **J. Younus:** None. **F. Perera:** None. **P. Tai:** None.

2010

Axillary Coverage During Radiation Therapy to the Breast With Tangents Alone

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Purpose/Objective(s): A recent large randomized trial showed no decrease in disease-free survival or overall survival in women with breast cancer found to have one or two positive sentinel lymph nodes in whom axillary lymph node dissection was omitted. These women were all treated with lumpectomy followed by tangential whole-breast irradiation. One theory for why the women did so well is that the simple tangents used to treat the breast also addressed the undissected axilla. The purpose of this study is to evaluate the percent of the prescribed dose of radiation to the breast received by the axillary nodal regions with tangents alone in women with early-stage breast cancer.

Materials/Methods: The radiation therapy plans for 150 women treated sequentially from 5/2011 through 8/2012 for Stage 0, I or IIA breast cancer with simple tangents were analyzed retrospectively. Radiation plans for patients with early-stage breast cancer were selected to ensure the treating physicians were not specifically targeting the axilla with "high tangents." Axillary levels I, II, and III were contoured on these plans per the RTOG Atlas guidelines and the plans were re-calculated to determine amount of coverage of each level of the axillary contents.

Results: Analysis of the data shows that the mean percent of axillary levels 1, 2, and 3 receiving >90% of the prescribed dose to the breast is 49% (standard deviation, or SD = 25%), 3% (SD = 10%), and 0.1% (SD = 10%), respectively. The mean percent of axillary levels 1, 2, and 3 receiving >50% of the prescribed dose to the breast is 67% (SD = 26%), 11% (SD = 21%), and 1% (SD = 5%), respectively. The mean max point dose received by axillary levels 1, 2, and 3 as expressed as a percent of the prescribed dose to the breast was 103% (SD = 4%), 42% (SD = 42%), and 16% (25%), respectively. Comparison of left vs right sided tumors and inner vs outer quadrant tumor showed no difference in amount of axillary coverage.

Conclusions: In a low-risk breast cancer patient being treated with traditional tangents, coverage of the axilla is minimal with moderate coverage of level 1 but almost no coverage of levels II and III. Traditional tangents cannot be relied upon to adequately treat the axilla, as in the case of a positive sentinel node biopsy with no completion axillary nodal dissection.

Disclaimer: The views expressed in this abstract are those of the author and do not reflect the official policy of the Department of Army/Navy/Air Force, Department of Defense, or U.S. Government.

Author Disclosure: **D.L. Erickson:** None. **C. Premo:** None. **S. Greco:** None. **L. Herscher:** None. **S.F. Stinson:** None.

2011

Tangential Field Technique for Breast Cancer: The Dose to the Heart and Heart Subvolumes

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Purpose/Objective(s): Large retrospective data have demonstrated a relationship between the delivered heart dose and major coronary events. The aim of the present study was to analyze the doses to different heart