Materials/Methods: Beginning February 14, 2011, our institution made a practice change to obtain PLMs prior to adjuvant radiation on all patients with visible calcifications on preoperative mammography. Women who underwent breast-conserving surgery and were seen in consultation for treatment of intact breast cancer were eligible.

Results: Over a three-year time period, 1,047 intact breast cancer patients were evaluated within the Radiation Oncology department, of whom 558 underwent a PLM and were deemed eligible for evaluation. Suspicious calcifications were noted in 60 patients (10.7% of patients). Residual calcifications were identified at the lumpectomy site in 38 cases. In 13 cases there were suspicious calcifications noted in a separate location from the original lumpectomy and in 9 cases calcifications were felt to be pulled near the lumpectomy site from a separate location. The PLM led to a change in management in 47 instances; the remainder had close or positive margins, for which surgery was recommended regardless. Within these 47 cases, 20 were found to have residual disease (42.5%), 26 had no residual disease and 1 remained undiagnosed. In total, 20/558 patients (3.6%) had residual disease and thus derived benefit from the PLM. Ductal carcinoma in situ (DCIS) was the primary histology in a majority of the patients with residual disease (60%). DCIS or extensive DCIS was identified in 85% (17/20) of these cases. Likewise, a high percentage of patients with margins ≤ 2 mm (75%) and grade 2/3 (70%) were identified within this population.

Conclusion: Obtaining a PLM prior to radiation has the potential to be a useful tool in select patient populations. Prior studies have been limited by selection bias and small sample sizes. Our study overcomes these obstacles by evaluating a large patient population. Establishment of a nomogram to identify patients best suited to benefit from a PLM would further improve the utility of this technique.


2007

Comparative Planning Study of Different Tumor Bed Localization Modalities After Oncoplastic Conservative Surgery for Early-Stage Breast Cancer

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Purpose/Objective(s): To investigate modalities of tumor bed localization for target volume delineation (clinically, CT, ultrasound (US) in comparison to surgical clips-guided delineation) and the impact of the differences in delineated tumor bed volumes on dosimetric parameters.

Materials/Methods: Twenty seven patients who underwent oncoplastic breast conservative surgery with surgical clips insertion (at least 3 clips) were included. CT & US imaging for tumor bed localization were done 3-4 weeks postoperatively in the same treatment position. Tumor bed was delineated four times; using surgical clips, clinical data, CT (seroma based) & US based. A plan was done for each tumor bed delineated. The four delineated volumes were compared regarding volumetric differences, geographical miss, and overlap index.

Results: Tumor bed volumes were compared for the 4 modalities; it showed median values of 60.7 cm3 for clinical vs 60.8 cm3 for CT vs 49.3 cm3 for US in comparison to 59.7 cm3 for clips (P = 0.05). Median values for GMI (Geographical miss index: represented the tissue within the tumor bed at high risk of local recurrence which would not have been treated in the boost field if the experimental test was used), were 61.8% for clinical vs 45% for CT vs 62.4% for US, with a statistically significant difference (P = 0.029). Median values for NTI (normal tissue index: was used to give an estimate of the area of normal tissue, which would have been included unnecessarily & is not at risk of local recurrence), were 59.5% for clinical vs 49.6% for CT vs 62.3% for US (P = 0.179). Overlap index (compared to clips-guided) value for clinical method was 0.36 vs 0.42 for CT vs 0.35 for US with a statistically significant difference (P = 0.041). In the anterior-posterior direction, the median shift was 0.72 cm for clinical vs -0.03 cm for CT vs -0.2 cm for US (P = 0.024). In the superior-inferior direction, the median shift was -0.07 cm for clinical vs -0.15 cm for CT vs -0.09 cm for US (P = 0.455). In the medio-lateral direction, the median shift was 0.4 cm for clinical vs -0.13 cm for CT vs 0.09 cm for US (P = 0.607).

Conclusion: Significant differences in shifts & indices were detected between clinical, seroma or US boost localization when compared to surgical clips modality. Thus, in the setting of oncoplastic breast surgery, surgical clips should be routinely used for tumor bed localization. In view of the larger volumes of breast tissue excised & the extensive remodeling that are inherent to many oncoplastic procedures, the concept of tumor bed boost irradiation should be re-challenged.


2008

Outcomes of Hypofractionated Versus Standard Fractionated Breast Cancer Radiation in the Real World: A Population-Based Analysis

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Purpose/Objective(s): Randomized trials have compared hypofractionated (11-24 fractions) and standard fractionated (25-40 fractions) breast radiation after breast conserving surgery and have found no differences in local control, overall survival, or cosmetic outcome. We hypothesize that the perception amongst US physicians of the risk of late toxicity with hypofractionated radiation therapy has hindered the use of hypofractionated radiation therapy. The purpose of this study is to use population-based data to understand the real-world toxicity and tumor control in early stage breast cancer patients receiving either hypofractionated or standard fractioned radiation therapy.

Materials/Methods: We used the Surveillance, Epidemiology, and End Results (SEER)-Medicare linked database to identify early stage breast cancer patients diagnosed between 2000 and 2009 who were treated with breast conserving therapy. Using Medicare claims data, we identified a cohort of hypofractionated and a cohort of standard fractionated radiation therapy patients. We then identified radiation-related toxicities, including cardiac toxicities (myocardial infarction, coronary artery disease, valvular disease, conduction disorders, congestive heart failure, cardiomyopathy, and pericardial disease), breast-specific toxicities, hematologic toxicities, plexopathies, radiation pneumonitis, and upper extremity fractures. Additionally, we examined the rates of local tumor control and secondary malignancies. Each toxicity was determined by the presence of its ICD-9 diagnosis code or HCPCS code within the Medicare claims data. The association between radiation fractionation and the endpoints of toxicity and local tumor control was determined with cumulative incidence analysis and Fine-Gray regression.

Results: Our study population consisted of 23,125 women with early stage breast cancer who received breast conserving surgery followed by either hypofractionated (n = 1,497) or standard fractionated (n = 21,628) radiation therapy. Women in the hypofractionation cohort were older and had greater comorbidity than those in the standard fractionation cohort. On univariate analysis, we found that hypofractionation was associated with a low but slightly increased rate of local tumor recurrence (3.1% vs 1.5%, p = 0.05) compared to standard fractionation. This