

Accelerated Partial Breast Irradiation at Virginia Hospital Center: Analysis of Dosimetric Outcomes and Predictors of Acute Toxicity

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Purpose/Objective(s)

Dosimetric factors in 48 consecutive patients treated with accelerated partial breast brachytherapy using three different applicators were analyzed and correlated to acute clinical outcomes.

Materials/Methods

Between May 2008 and January 2009 a total of 48 women with node negative invasive carcinoma and carcinoma in situ of the breast underwent accelerated partial breast high dose rate irradiation using one of three devices: MammoSite Single Lumen Balloon, Contura Multi-Lumen Balloon, and SAVI (Strut Adjusted Volume Implant). An ultrasound guided closed technique post lumpectomy was used in all patients. All patients were treated to a dose of 3.4 Gy BID for 10 fractions prescribed at a depth of 1 cm from the surface using an Iridium 192 source. All patients were assessed post treatment by the Radiation Oncologist or surgeon at regular follow up intervals beginning at 4-6 weeks post treatment. The Common Terminology Criteria for Adverse Events (CTCAE version 3.0) were used to score toxicity and a physician reported assessment was used for cosmesis.

Results

Median follow up was 4 months (range 0.2 -8 months). There were 28 left sided and 20 right sided lesions. The median tumor size was 1cm (range 0.4-2.5cm). Median balloon volume was 40cc (range 8cc to 70cc). Median skin bridge was 12mm (range 4mm to 35mm). Those with <5mm were treated with SAVI. The median max skin dose was 82% of prescription (range 45-129%). Median air cavity was .5% (range 0-9.3%). Median D90 was 99% (range 72-103%). Median V150 was 29cc (range 13-38cc). Median V200 was 6.7cc (range 2.8-11cc). Median number of dwell positions used 5 (range 1-35). Median number of catheters used 1 (range 1-7). We also recorded the catheter insertion dose which was median of 31% of prescription dose (range 14%-70%). 31 patients were treated with mammosite, 14 with contura and 3 with SAVI. Of 48 patients, 2 developed grade 3 events; 1 patient had fat necrosis requiring surgical debridement, and 1 patient had delayed closure of the catheter insertion site.

Conclusions

APBI was well tolerated acutely. With careful surgical planning, proper device selection, and versatile treatment planning, excellent short term clinical results can be achieved in the community setting. Limiting maximum skin dose to <130% of prescription dose and limiting catheter insertion dose to <70% of prescription to avoid acute skin toxicity and delayed wound closure lead to better outcomes.