

AbstractID: 11537 Title: On the dosimetric differences between single dwell and multiple-dwell accelerated partial breast brachytherapy plans delivered with a single catheter spherical balloon

**Purpose:** To compare single and multiple-dwell dose distributions in patients treated with Mammosite (Cytac Corp., Marlborough, MA) spherical balloons. **Methods and Materials:** 11 patients from our clinical data base were chosen. For each patient four treatment plans were generated: single dwell centered within the balloon, two, three and four dwells spaced uniformly along the catheter. Plans were generated with the Plato treatment planning system ver. 14.3.5 (Nucletron B.V., TH Veenendaal, The Netherlands) and imported into the Pinnacle<sup>3</sup> planning system ver. 8.0h (Phillips Electronics N.V., Eindhoven, The Netherlands) for analysis. DVHs for the PTV, skin and ribs were computed. ANOVA from Matlab® (The Mathworks Inc., Natick, MA) was employed to detect differences in coverage of the 90%, 95%, 100%, 150% and 200% for the PTV, as well as differences in the 100 cGy, 125 cGy and 145 cGy doses to the skin and ribs. Dose difference DVHs were generated for each critical structure to illustrate any differences in the four planning methods. **Results:** The PTV DVH exhibited no significant difference amongst the four planning methods. The mean coverage of the 90%, 95%, 100%, 150% and 200% in the PTV showed no statistical difference amongst the four planning methods ( $p=0.8535, 0.6848, 0.4048, 0.7181, 0.6568$ ). However, significant differences in skin doses (100 cGy and 125 cGy) were exhibited ( $p=0.0054, 0.0269$ ). The single dwell method resulted in a higher percentage of skin receiving 100 cGy and 125 cGy (30% and 32% respectively). Significant differences of the 125 cGy and 145 cGy dose to the rib were also seen. ( $p=0.0582, 0.0841$ ). The single dwell method resulted in a higher percentage of rib receiving 125 cGy and 145 cGy (29% and 26% respectively). **Conclusions:** Single and multiple dwell plans can provide similar PTV coverage. However, single dwell plans exhibit higher doses to the skin and ribs.