

# AbstractID: 14016 Title: Dosimetric Comparison of Three Multi-Lumen Brachytherapy Applicators with the Original MammoSite® Balloon Used in Partial Breast Irradiation (PBI)

## Purpose:

There is difficulty in achieving the desired dose distribution to the planning target volume (PTV) with the single lumen MammoSite®. The purpose of this investigation is to show that with a multi catheter device one can significantly lower the mean skin and chest wall doses compared with the original MammoSite®, and to quantify performance of each device using certain parameters listed in the methods below. In this paper, a dosimetric comparison of the original MammoSite® against MammoSite® ML (Hologic, Inc.), Contura (Senorx Inc.), and SAVI™ (Cianna Medical, Inc.) will be presented.

## Methods:

Parameters quantified include dose asymmetry (the dose at 1 cm from the device in a direction of asymmetry divided by the prescription dose), skin dose and objective values to quantify minimum and maximum dose within the PTV given from RTOG 0413 protocol (V150 and V200). Planning was done using BrachyVision™ TPS (Varian Medical Systems, Inc.), and the volume of each applicator was approximately 27cm<sup>3</sup>, resulting in a PTV of 75.5cm<sup>3</sup>.

## Results:

With MammoSite® ML, the dose asymmetry at 1 cm resulted in an asymmetry of 12.2 %, a V150 of 35.7cm<sup>3</sup>, and a V200 of 10.5cm<sup>3</sup>. With Contura, the dose asymmetry at 1 cm resulted in an asymmetry of 13.0%, a V150 of 21.7cm<sup>3</sup>, and a V200 of 5.4cm<sup>3</sup>. For the SAVI applicator, the dose asymmetry at 1cm resulted in an asymmetry of 52.0%, a V150 of 24.8cm<sup>3</sup>, and a V200 of 12.5cm<sup>3</sup>.

## Conclusion:

Optimization of the PTV involves creating a uniform dose throughout the PTV and minimizing the volume of tissue receiving more than 150% of the dose. With any of the three multi-lumen applicators there can be a decrease to the skin as compared with the original MammoSite.