

AbstractID: 11594 Title: Clinical use of multi-lumen catheter for accelerated partial breast irradiation

Purpose: To evaluate the effectiveness of using multi-lumen balloon brachytherapy for early-stage breast cancer. **Method and Materials:** Five patients treated with HDR brachytherapy using the Contura™ applicator (SenoRx, Inc.) were investigated in this study. Patients underwent CT scanning with 2mm/2mm cut. The inverse planning optimization was used for the plan using multi-lumen catheter. A single dwell at central channel was applied to simulate the plan applying MammoSite® catheter. The resulting isodose distributions and DVH were computed and compared. **Results:** The mean minimum skin and rib spacing were 1.0 cm and 1.6 cm with a range of 0.25 to 2.7 cm and 0.6 to 4.4 cm, respectively. The mean V100, V150, V200 for the MammoSite® plan were 91.9%±3.5%, 30.4c.c.±4.1c.c. and 4.2c.c.±1.8c.c., respectively. When the patient was implanted under suboptimal conditions, the coverage for PTV can be maintained or improved for multi-lumen plan. The mean V100, V150, V200 for the multi-lumen plan were 94.8% (S.D.±0.9%), 32.8c.c. (S.D.±2.9c.c.) and 6.1c.c. (S.D.±2.2c.c.), respectively; however, the dose to skin surface and ribs were reduced significantly. Careful alignment of the catheter right before the treatment is important. The Contura™ catheter tends to rotate +/- 90° between each treatment for our patients. Without proper alignment, an unexpected high dose may be delivered to critical organs. **Conclusions:** The use of the multi-lumen applicator appears to deliver a dose to the target with greater coverage while minimizing the skin surface and rib dose at the same time as compared to MammoSite® plan. For patients with suboptimal implantation, who are not qualified for MammoSite® brachytherapy, they still could benefit from accelerated partial breast irradiation using multi-lumen catheter. It is expected to result in better cosmesis and minimizing late effects. However, it is important to align the catheter precisely prior to each treatment and avoid the rotation during the treatment.