

AbstractID: 6890 Title: Adaptive planning for accelerated partial breast brachytherapy using the elliptical MammoSite balloon

Purpose: To demonstrate that accelerated partial breast brachytherapy using the elliptical MammoSite balloon requires a thorough evaluation of balloon geometry by use of volumetric imaging during the course of treatment, and may require adaptive planning.

Methods and Materials: Patient was implanted with 4cmx6cm elliptical MammoSite. CT scans were acquired and sent to treatment planning system (TPS). Balloon and CTV (balloon plus 1cm margin, excluding 0.5cm from skin) were contoured. Dwell positions were activated along the catheter. Dwell times were optimized to deliver at least 90% of prescription dose, 340cGy, to greater than 90% of the CTV. Dwell times and positions were used for treatment of first fraction. Treatment was to be delivered in ten fractions, twice daily. The patient was re-imaged using CT prior to subsequent fractions. We evaluated the effect of using the original treatment plan for subsequent fractions. The repeat scans were sent to TPS for contouring and catheter entry. Dwell times and positions from fraction one were used to recalculate dose distributions on repeat scans. The resulting plans were compared to that from fraction one in terms of target volume coverage, skin dose (<125% of prescription), volume of tissue receiving 150% and 200% of prescription dose (V150<50cc and V200<20cc).

Results: Use of the first fraction plan for treatment of subsequent fractions led to acceptable target volume coverage, V150, and V200. However, skin dose increased due to gradual changes in balloon shape over the course of treatment. Subsequent fractions did require adjustments in dwell time to decrease skin dose.

Conclusion: When using the elliptical MammoSite, the appropriateness of using the original plan for treatment of subsequent fractions depends on changes in balloon shape as well as volume, necessitating the acquisition of volumetric images prior to each treatment. Furthermore, volumetric imaging facilitates adaptive planning to account for these changes.