AbstractID: 10586 Title: Assessment of interobserver and intraobserver surgical cavity contour variability in accelerated partial breast irradiation through the use of a representative surgical cavity contour

Purpose: To quantify interobserver and intraobserver variations in definition of the surgical cavity (SC) in the planning of accelerated partial breast irradiation (APBI). **Method and Materials:** Eight prospectively accrued patients underwent four CT scans each: one planning CT and three repeat CTs during treatment. Three radiation oncologists contoured the SC on each scan for all patients and repeated the contours two times on each scan for three patients. Analysis of contour variations was performed by combining the contours to create a representative surgical cavity (RSC); the volume and spatial extent of each contour was compared with the RSC. Agreement of the delineated volumes was quantified by comparing the volume enclosed by all contours with the volume common to all contours. The standard deviation at each point where the RSC was calculated was also used to assess spatial variations. Fields from the original treatment plans were applied to the repeat CTs and dose distributions in the SCs were evaluated using the equivalent uniform dose approach. **Results:** The average interobserver volume difference was larger than the intraobserver difference (3.09 versus 0.86 cm^3). The average agreement of the delineated volumes was 15.4% better in intraobserver than in interobserver comparisons. Likewise, the average interobserver spatial differences were larger than the intraobserver differences (0.34 versus 0.11 cm in the superior-inferior direction, 0.37 versus 0.23 cm in the anterior-posterior direction and 0.62 versus 0.28 cm in the left-right direction). RSC standard deviations tended to be larger for interobserver rather than intraobserver variations. Despite interobserver variations, margins used for planning appeared sufficient to achieve clinically acceptable coverage of the SC. **Conclusion:** Interobserver variations are most responsible for SC contour variability in APBI. Future studies investigating changes in shape or position of the SC should focus more effort accounting for interobserver rather than intraobserver variability.