AbstractID: 10356 Title: Effect of IGRT Motivated Margin Reduction in Postprostatectomy IMRT Plans

Purpose: Image-guided radiation therapy (IGRT) aims at reducing treatment margins without compromising clinical outcome. The dosimetric impact of margin reduction associated with a specific localization technique can be evaluated by planning patients with different margin specifications. The following presents such an analysis for a group of postprostatectomy patients. **Method and Materials:** Fourteen patients underwent computed tomography based simulation. The CTV was contoured by a single physician following RTOG guidelines. The patients were subsequently planned with Eclipse (Varian Medical Systems) using the AAA algorithm. Three sets of CTV-to-PTV margins were used, which were within RTOG 0534 protocol guidelines: 15 mm in all directions except 8 mm posteriorly (15/8 mm), 11 mm in all directions except 7 mm posteriorly (11/7 mm) and 8 mm in all directions except 6 mm posteriorly (8/6 mm). The IMRT plans achieved the same target coverage. Dose-volume histogram (DVH) statistics were extracted for the bladder and rectum and compared for the different margin sets. **Results:** In all cases the organ at risk volumes receiving a certain threshold dose diminishes as the margin gets reduced. The overlap between the bladder and rectum with the PTV sets boundaries to the achievable plan statistics. On average there is a ~2% reduction of the volume receiving a 40-65 Gy for the bladder for each mm the margin is decreased and a ~5%/mm reduction for the volume receiving 50-70 Gy for the rectum. **Conclusion:** This analysis provides a quantitative description of the possible reduction in rectum and bladder doses that can be achieved with reduced setup margins for IMRT postprostatectomy patients. This also shows that acceptable plan statistics could not be achieved when following RTOG guidelines. **Conflict of Interest:** This research was funded in part by a grant from Varian Medical Systems.