

AbstractID: 10830 Title: Radiotherapy treatment plans with RapidArc for prostate cancer involving seminal vesicles

Purpose: The purpose of this report is to compare RapidArc plans and conventional IMRT plans for prostate cancer involving seminal vesicles.

Methods and Materials: This study included 10 patients. The planning-target volume (PTV) contained the prostate and seminal vesicles with a margin of 1cm in all direction except 7mm posterior. The prescription was 54Gy to the PTV (2Gy/fraction). Three plans were generated for each patient: 7-beam IMRT, one-arc RapidArc (1Arc), and two-arc RapidArc (2Arc). Dosimetric results were compared and treatment time was calculated

Results: RapidArc provided marginally better dose conformity and homogeneity for PTV coverage than IMRT for both Groups. The bladder D_{30} (the percentage dose delivered to 30% of the bladder) was 7% less ($p=0.001$) in 1Arc and 10% less ($p<0.001$) in 2Arc than in IMRT. The rectum D_{30} was 2% less ($p>0.1$) in 1Arc and 5% less ($p=0.009$) in 2Arc than in IMRT. The integral dose to normal tissue was very similar for all plans ($p>0.1$). Average MU values were 803, 531 and 703 for IMRT, 1Arc and 2Arc, respectively. Calculated treatment time including beam-on time and beam-off time (the time in-between fields for machine setting and electronic data transfer) was 6.2 min, 1.7 min and 3.4 min for IMRT, 1Arc and 2Arc.

Conclusions: RapidArc provided more efficient treatment delivery compared to IMRT for prostate cancer involving seminal vesicles. RapidArc and IMRT achieved very similar PTV coverage. RapidArc performed slightly better in sparing critical organs than IMRT for PTV with prostate and seminal vesicles. RapidArc with 2-arc beams provides slightly better dosimetric results than RapidArc with 1-arc beam although the treatment time becomes double.