

AbstractID: 12860 Title: Which modality is better for prostate cancer, single arc RapidArc, dual arc RapidArc or IMRT?

Purpose/Objective: Intensity-modulated radiation therapy (IMRT) and intensity-modulated arc therapy (IMAT) are the two principal dose delivery techniques for the treatment of prostate cancer in many institutions. However, IMAT which is not widely available yet poses better potentials compared to conformal plan delivering. The purpose of this work is to evaluate prostate plans from IMRT, single arc RapidArc and dual arc RapidArc according to the balance of the treatment time, MU and plan quality, in order to determine which technique is better for clinical prostate cancer treatment.

Materials & Methods: Six prostate patients were selected for this study. For each patient, single arc, dual arc and IMRT plans with same algorithm were produced and approved with a prescribed dose 59.4 Gy as a primary treatment. Plan comparisons were based on the dose coverage, target dose homogeneity index (HI), mean target dose, and the mean critical structure dose. Some clinical criteria for critical structures, such as volume received 50 Gy and 30 Gy dose for bladder (B50/B30) and for rectum (R50/R30) were checked for each plan according to our clinical protocol.

Results: The target dose coverage for the three techniques were all clinical accepted. The HI for both IMRT and dual arc were better than single arc. The dual arc had less rectum and bladder dose according to mean dose, B50/B30 and R50/R30 comparisons for each plan. The MU of dual arc plans was 12%~58% less than IMRT plans and the treatment time was 70% less than IMRT plans.

Conclusion: Six prostate plan qualities have been evaluated and compared for single arc, dual arc and IMRT techniques. According to the plan quality, treatment time and plan MU, the dual arc RapidArc plan is more acceptable for clinical use.