AbstractID: 3100 Title: Conformal target versus conformal avoidance IMRT in patients with prostate cancers

Purpose: To compare conformal avoidance IMRT with conformal target IMRT for the radiotherapy of prostate cancers.

Method and Materials: Twenty patients with prostate cancer who underwent IMRT were selected for this study. For comparison, five plans were generated for each patient with different emphasis on conformal target or conformal avoidance: very conformal target IMRT plan (Plan I, maximum weights for targets and least weights for OARs), conformal target IMRT plan (Plan II, maximum weights for targets and relatively small weights for OARs), balanced IMRT plan (Plan III, maximum weights for targets and medium weights for OARs), conformal avoidance IMRT plan (Plan IV, maximum weights for targets and relatively large weights for OARs) and very conformal avoidance IMRT plan (Plan V, maximum weights for both targets and OARs). All the five plans were designed to deliver 66.6 Gy (prescription dose) to 100% of the CTV.

Results: The target dose coverage became worse as plan changed from very conformal target to very conformal avoidance, as 100% isodose line cut more and more through PTV adjacent to rectum. On the other hand, the rectum sparing increased at the same time, due to the increased emphasis on the avoidance of OARs. Overall, all the five plan schemes achieved the goal of delivering 66.6 Gy to the whole CTV. However, Plan IV was slightly better than the rest of plans in terms of largest CTV V100 (99.90%), best homogeneity in CTV dose distributions (smallest difference between Dmax and Dmin) and smallest Rectum D25 (58.88 Gy).

Conclusions: For prostate IMRT, practicing conformal avoidance in inverse planning process can achieve better target dose coverage and homogeneity, as well as larger critical structure sparing.

Conflict of Interest (only if applicable): None.