

AbstractID: 13810 Title: Dosimetric evaluation of the use of air or water filled endorectal balloons for prostate IMRT patients

Purpose: Prostate cancer patients undergoing intensity modulated radiation therapy (IMRT) are typically treated without endorectal balloon in our clinic. On occasion, there is a clinical need to use endorectal balloons. The purpose of this study is to evaluate the dosimetric advantages and disadvantages of using water or air in endorectal balloons.

Materials and Methods: In an IRB approved protocol, water filled endorectal balloons were inserted into the rectum of 7 prostate patients. The patients were imaged in the supine position with full bladder and endorectal balloon. The Pinnacle treatment planning system (TPS) was used for planning. The prostate, seminal vesicles, rectum, anterior rectal wall and bladder were contoured on all patients. A second plan was generated by converting the water into air by overriding the density of the water. Dose distributions and dose volume histograms were evaluated. To verify Pinnacle dose computation at the rectum-prostate (air-tissue) interface, the treatment plans were recomputed using Monte Carlo for the air balloons. Monitor units required to deliver the two plans were also compared.

Results: Mean dosimetric parameters for air vs water were; Rectum: V70 - 9.7% vs 11.6%; V60 – 17.3% vs 17.2%; V40; V40 – 34.7% vs 30.9%; Bladder: V70 – 6.5% vs 6.4%; Maximum dose: 8003 cGy vs 7953 cGy. Mean monitor units for the air vs water plans were 803 MU vs 710 MU.

Conclusions: The dosimetric parameters for rectum and bladder for air and water balloons were similar (<5%) indicating that either could potentially be used. The water-filled balloon plans required significantly less MU's as compared to the air balloons and required less planning time to meet dosimetric criteria and constraints when compared to air-filled endorectal balloons. Monte Carlo calculations agreed better with Pinnacle water balloon plans than air balloon plans.