

AbstractID: 2758 Title: Inter-fraction shape change when using an endorectal balloon for radiation therapy of the prostate

Purpose: To investigate inter-fraction shape change when using an air-filled endorectal balloon (ERB) to localize and immobilize the prostate.

Methods and Materials: Under an IRB-approved treatment protocol to evaluate the use of endorectal balloons, patients have port films acquired before delivery of the treatment fields. Position adjustments in the AP direction are made based on the comparison of lateral portal images with planning DRRs. After treatment, a left lateral portal image is taken to evaluate setup. Currently an ERB is used for 15 fractions (27Gy) of the total treatment. The anterior wall of the ERB in the left lateral portal images for five patients was contoured, and the results used to estimate inter-fraction shape change.

Results: The mean position of the ERB wall was within 2mm of its position in the treatment plan for all patients, with a standard deviation of 1.2 – 2.3mm at central axis (CAX). Since the ERB minimizes intrafraction rectum/prostate motion, most of this can be attributed to setup uncertainties or patient motion. The standard deviation of the ERB wall at a point 3cm superior to CAX, corresponding to the superior end of the prostate, was larger at 2.1 – 4.3mm. The total range in the position of the ERB wall (i.e. difference in most anterior and most posterior positions) at CAX and 3cm superior to CAX was 4-6mm and 6-13mm, respectively. These differences indicate some significant inter-fraction shape change.

Conclusions: Interfraction shape change of the ERB appears to be negligible (s.d. 3cm superior of CAX < 3mm) for three patients, but more important (>3mm) for two patients, indicating that some form of image-guided or adaptive radiation therapy may be useful for some patients. Results for more patients will be presented at the meeting.