

AbstractID: 6927 Title: Simultaneous Use of an Implanted Fiducial System and an Endorectal Balloon for the Treatment of Prostate Cancer

Purpose: To report on our initial experience of using an on-line implanted fiducial system simultaneously with an endorectal balloon to treat patients with prostate cancer.

Method and Materials: Patients had three fiducial seeds implanted in their prostate prior to radiotherapy treatment planning. Treatment was given in the prone position with an endorectal balloon inflated to 60 cc and a full bladder. Patients were initially positioned with the aid of lasers/tattoos and an immobilization cradle. Open-field radiation electronic portal images were then taken in the treatment position and compared to reference images prior to each fraction of treatment. The intermarker distances (IMDs) between the three implanted seeds were examined to gain insight on prostate deformation and seed migration for this treatment strategy. The IMDs for the initial three fractions were averaged for each seed pair to serve as our references. For subsequent fractions, the differences in IMDs between measured and reference values were computed. Our data were also compared to similar previously reported studies.

Results: We have analyzed the IMDs of 13 patients treated with implanted fiducials and an endorectal balloon. A total of 349 alignments were evaluable and thus, 1047 IMDs were calculated for this set of patients. The mean absolute IMD difference for all samples was 0.86 ± 0.88 mm, while the largest single IMD difference was 8.9 mm. For individual patients, the ranges of mean absolute IMD differences for a given seed pair and corresponding standard deviations were 0.32-1.85 mm and 0.22-1.66 mm, respectively. The maximum absolute IMD difference for individual patients ranged from 1.2-8.9 mm.

Conclusions: We have simultaneously implemented an on-line implanted fiducial system and an endorectal balloon during prostate cancer radiotherapy. The degree of deformation of the prostate gland during treatment has been examined. This study may help predict the potential dosimetric consequences due to prostate motion/deformation.