

AbstractID: 5730 Title: Daily Changes in Seminal Vesicle Location During Treatment of Prostate Carcinoma

Purpose: In this study we examined daily bladder filling variation and the effect it has on seminal vesicle (SV) location on patients treated for high-grade prostate carcinoma. Currently there are several methods of image-guided radiotherapy (IGRT) used to locate the prostate on a daily basis. These methods, however, do not account for the change in position of the SVs, relative to the prostate, determined during simulation (day 0). Using this displacement information, we would like to determine if our clinical SV PTV margin is adequate.

Method and Materials: To determine SV displacement, 496 daily sagittal ultrasound images (BAT, North American Scientific, Chatsworth, CA) from 18 patients were examined. The images provided sagittal outlines of the day-0 structures overlaid on the daily patient ultrasound. With the day-0 prostate aligned to the day-n prostate ultrasound image, differences between day-0 and day-n bladder and SVs positions can be determined. SV displacement was taken at the mid point of the SV. The change in bladder position was determined by the difference in posterior extent anterior to the SVs.

Results: The SV displacement population mean and standard deviation (SD) was 2.1 mm 2.8 mm respectively. The bladder displacement population mean and SD was 2.7 mm and 3.3 mm respectively. The maximum SV displacement for all patients was 2.5 cm. The maximum SV and bladder displacement SD for any one patient was 7.4 mm and 7.7 mm respectively.

Conclusions: The results show that in general typical SV motion is quite small averaged over a standard treatment course. Since the population SD is small, our 8 mm SV PTV is adequate using daily prostate alignment. There are however some patients who's SV location changes are substantial on a day to day basis given a SD of 7.4 mm. Consistent bladder filling may be critical when treating SVs.