

AbstractID: 8877 Title: Dosimetric analysis of real time and post implantation dosimetry for prostate

Purpose: To quantify the changes in prostate volume and its effect on dosimetry for real time inverse planned low dose rate brachytherapy.

Method and Materials: Ultrasound images of 30 consecutive patients in the lithotomy position were obtained one week before the implant procedure. The prostate and the urethra were contoured and then an optimized treatment plan was developed in order to obtain the number of Palladium-103 seeds needed to deliver the prescribed dose of 120Gy to the target. At the day of the implant a new optimized plan was created based on the patient's current prostate volume. Linked seeds were implanted according to the latter plan. A CT scan was performed after the seeds were implanted and the prostate and urethra were contoured. The post-implant treatment plan was developed by locating the seeds on the CT images and calculating the dose distribution.

Results: By comparing the real time in the operating room and the post implant prostate volumes, it was found that there was an increase in volume ranging from 31% to 39%. According to the post implant plans the V100 ranged from 81% to 99%. A larger volume increase was observed for smaller size prostates. Furthermore, the smaller prostate volumes showed the lower values of V100.

Conclusion: Prostate volume changes due to swelling after the implant appears to be associated with reduction of dose coverage as reflected in post implant dosimetry. Artifacts generated by the seeds, compromised the resolution of the CT images and hence the accuracy of post implant prostate volumes. It appears that these factors effect treatment planning which can ultimately determine the success in treating the cancer.