

AbstractID: 13888 Title: Real-Time Intraoperative Planning is Not Required to Achieve Consistent High Quality Implants for Prostate Brachytherapy

Purpose: Recently reported concerns in quality assurance (QA), has called into question the “pre-planning” approach for prostate brachytherapy. The purpose of this study was to determine if a high-quality implant, as defined by the amount of activity preplanned versus the amount of activity implanted, could be consistently delivered if the patient volume study and treatment planning were performed prior to entering the operating room at a single tertiary cancer center.

Methods: Medical records of 100 patients prospectively treated on an IRB approved protocol on monotherapy for selective intermediate-risk patients were reviewed. At least 10 days prior to their implant, all patients underwent a simulation, in the dorsal-lithotomy position with a urinary catheter, consisting of a volume study and pubic arch study. Planning was performed using the Variseed treatment planning system. All patients underwent an I-125 implant using stranded seeds to a prescribed dose of 145 Gy (0.391 mCi/seed). Pre-plan parameters were as follows; V100 > 95%, V150 < 60%, V200 < 20%, U200=0, and R100 < 1cc. A Day 30 CT scan and MRI were obtained for QA to evaluate post-implant dosimetry. The amount of activity was determined for each patient and statistical analysis was performed using Spearman’s rank correlation coefficient.

Results: The number of planned and implanted I-125 seeds, were almost identical for each patient (Average: pre-plan = 83.04; post-plan=83.22) and had a correlation value of 0.999. The average prostate V100 for the pre-plan and post-implant was 99.99% and 98.64% respectively. The average prostate D90 for the pre-plan was 186.3 and the post-implant D90 was 185.2. The average rectum R100 for the pre-plan and post-implant were 0.4 and 0.31 respectively.

Conclusion: Consistent high-quality implants can be achieved using a “pre-planning” approach. However, QA measures are required during the simulation, treatment planning, implant, and post-implant evaluation to achieve this consistency.