

AbstractID: 2749 Title: Detailed Urethral Dosimetry in the Evaluation of Prostate Brachytherapy-Related Urinary Morbidity

Purpose: To evaluate the relationship between post-prostate brachytherapy urinary morbidity and urethral doses calculated at the base, mid-prostate, apex and urogenital diaphragm.

Materials and Methods: 186 consecutive patients with no history of transurethral resection underwent monotherapeutic prostate brachytherapy (no external beam radiation or androgen deprivation) with urethral sparing techniques (average urethral dose 100-140% of prescribed dose). The median follow-up was 45.5 months. Urinary morbidity was defined by time to International Prostate Symptom Score (IPSS) resolution, maximum increase in IPSS, catheter dependency, and the need for postimplant surgical intervention. An α -blocker was initiated approximately 2 weeks prior to implantation and continued until the IPSS returned to baseline. Evaluated parameters included overall urethral dose, doses to the base, mid-prostate, apex and urogenital diaphragm, patient age, clinical T-stage, preimplant IPSS, ultrasound volume, isotope, D90 and V100/150/200.

Results: Of the 186 patients, 176 had the urinary catheter permanently removed on the day zero and only 1 patient required a urinary catheter > 5 days. No patient developed a urethral stricture, and only two patients required a postbrachytherapy TURP. For the entire cohort, mean IPSS peaked 2 weeks following implantation, and the median time to IPSS resolution of 3 weeks. For the entire cohort, only isotope predicted for IPSS resolution, while neither overall average prostatic urethra nor segmental urethral dose predicted for IPSS resolution. The maximum postimplant IPSS increase was best predicted by preimplant IPSS and the maximum apical urethral dose.

Conclusions: With the use of prophylactic α -blockers and adherence to urethral sparing techniques, urethral dosimetry did not improve the ability to predict urinary morbidity. Neither the average dose to the prostatic urethra nor urethral doses stratified into base, mid-prostate, apex, and urogenital diaphragm segments predicted for IPSS normalization. Radiation doses of 100-140% mPD are well tolerated by all segments of the prostatic urethra.