

AbstractID: 1262 Title: Comparison of Intraoperative Ultrasound Dosimetry to Post Implant CT Dosimetry in Permanent I-125 Prostate Brachytherapy

Ultrasound-guided transperineal ^{125}I and ^{103}Pd prostate implants have been performed at UPMC Passavant since May of 2002. 16 patients that were treated for early stage prostate cancer with ^{125}I seeds to a dose of 145 Gy were selected for this study with the same urologist to avoid any variance in prostate volume definition. VariSeed 7.0 (Varian® Medical Systems, Palo Alto, CA) was used for intraoperative dosimetry using ultrasound images and for post implant dosimetry using CT images. A two-tailed T-test was conducted using SPSS software to compare the two planning methods.

The mean prostate volume defined with ultrasound was 34.5cc and with CT was 34.3cc. The averaged elapsed days between the implant and post-implant CT scan was 35.4 days. The means doses of D_{90} and D_{80} of the intraoperative plans were 177.2 Gy and 193.9 Gy, respectively and for the post implant CT plans were 170.5 Gy and 192.8 Gy, respectively. The mean percentage volume of V_{200} , V_{100} , V_{90} , and V_{80} for the intraoperative plans were 21.8%, 97.2%, 98.6% and 99.4%, respectively and for the post implant plans were 31.8%, 95.7%, 98%, and 99.4%, respectively. For the intraoperative plans, the mean of V_{150} was 55.5% (SD \pm 22.6) versus 63.3% (SD \pm 12.5) for the post implant CT plans. This represents a 14% increase in mean volume of the prostate receiving 150% of dose, which is statistically significant ($p < 0.005$). The intraoperative and post CT plan means of D_{90} , D_{80} , V_{200} , V_{150} , V_{100} , V_{90} , and V_{80} were similar.