

AbstractID: 6433 Title: Partial volume analysis in LDR brachytherapy of prostate cancer – comparison of intraoperative ultrasound planning and post implant CT dosimetry

Purpose: Dose distribution in the base and apex of prostate and in the penile bulb in permanent seed implantations may influence the probability of urinary symptoms and erectile dysfunction. We compared the dose distribution in these partial volumes and the organs of risk in the intraoperative US- and the post-implant CT-planning.

Method: More than 550 patients were implanted with I-125 seeds following the recommendations of the ABS/ESTRO/EORTC for a permanent prostate brachytherapy. Base for the dosimetry was an ultrasound guided intraoperative interactive real-time planning. Post-implant CT dosimetry was performed in all patients 6 weeks after implantation. Looking for coherences between dose distribution and side effects a partial volume analysis was performed particularly in the apical and basal part of the prostate and in the penile bulb. Dosimetric data analyzed were among others V100, D90 and the mean dose both in the intraoperative planning and post-implant CT-plan. They were correlated with the IPSS-, EF-score and QLI.

Results: Mean follow up was 32 months. The rectal V100 was significant higher in the post-plan (0.25cc vs. 0.81cc) but still under 1.3cc. The D90 of the apical part of the prostate was 177Gy (median) in the ultrasound planning and 165Gy in the CT-plan, D90 of the base of the prostate was 175Gy and 159Gy. The D90 of the penile bulb in the CT-plan was 40 to 78Gy (median 56Gy) with a V100 of 0.02cc to 0.7cc. A significant correlation between dose distribution in the partial volumes and the IPSS-, EF- and QLI data could be shown.

Conclusion: A partial volume dosimetry analysis of the prostate may offer the possibility of lower side effects. Looking more into detail for the dose distribution a better dose homogeneity with a better QoL for the patient can be achieved. Intraoperative and post-implant CT dosimetry data are well correlated.