

AbstractID: 10524 Title: Localizing Differences in ¹³¹Cs Intraoperative and Postoperative Prostate Seed Brachytherapy Plans.

Purpose: Relative shifts in isodose curves were noted between post-operative and intra-operative ¹³¹Cs prostate seed plans. This study examines the dose differences between intra-operative and post-operative plans and evaluates regions of prostate to determine the direction of the shift.

Materials and Methods: 103 patient plans done with ¹³¹Cs seed implants were examined. Each intra-operative plan was derived in realtime via TRUS. Loose seeds (mean activity of 2.1U) were implanted to deliver a peripheral dose of 115Gy. Post-operative studies were evaluated via CT at 4 weeks post implant. Intra-operative and post-operative prostate D90, D100 and V100 were compared. 50 patients were randomly selected and had two additional volumes contoured, Anterior-Prostate (AP) and Posterior-Prostate (PP). D90, D100 and V100 values for these additional regions were also compared. **Results:** Comparing intra-operative and post-operative plans, significant differences ($p < 0.0001$) were noted in D90, D100 and V100 prostate values. From the intra-operative to the post-operative plan, 91.3% of plans showed a reduction in D90. Post-operative D100 values dropped $\geq 10\%$ in 73.8% of patients. V100 prostate quantities dipped in post-operative plans $\geq 4\%$ in 64.1% patients. For the additional regions contoured, intra-operative AP D90, D100 and V100 values were $\geq 10\%$ higher than their corresponding post-operative values in 74.0%, 64.0% and 68.0% of patients, respectively. Intra-operative to post-operative dose reductions of at least 5% to the PP D90 and D100 values were noted for 56% and 64% of patients. Conversely, 62% experienced increased post-operative PP V100 values of at least 5%.

Conclusion: These findings confirm significant prostate dose discrepancies between intra-operative and post-operative plans. Specifically, the dose to anterior prostate was consistently overestimated in intra-operative plans. Discrepancies are believed to be due to the probe deforming the prostate during the implant. However, further evaluation is needed to provide conclusive results.