

AbstractID:9431Title:Do simetrican alysis and comparisonofCesium-131andIodine-125for permanent prostate brachytherapy

Purpose: To perform a dosimetric analysis and comparison of Cesium-131 and Iodine-125 for permanent prostate brachytherapy.

Method and Materials: TRUS prostate volumes of 30 patients treated in our institution with a wide range of prostate size were included in this study. The average gland size was 31.13 cc (from 15.22 cc to 51.49 cc). Treatment plans were generated using Variseed 7.1 with both Cesium-131 (with an activity of 2.1 U, prescription of 115 Gy) and Iodine-125 (with an activity of 0.521 U, prescription of 145 Gy). Prostate, rectum, urethra were contoured by the same radiation oncologist. The Auto Source Placement tool of the software was first used to create treatment plans for both Cesium-131 and Iodine-125. The plans were then adjusted to meet the treatment goals and achieve the same dose coverage (V_{100} , V_{90} , D_{90}) of the prostate for both isotopes. The dose to the prostate (V_{100} , V_{90} , V_{80} , D_{90}), rectum (RV_{100} , RD_{10}), urethra (UD_{10}), and dose in homogeneity (V_{150} , V_{200}) were reported.

Results: For 30 patients, the average of V_{100} , V_{90} , V_{80} , D_{90} for the prostate was 98.58%, 99.46%, 99.95%, 134.7 Gy and 98.49%, 99.57%, 99.87%, 170.4 Gy for Cesium-131 and Iodine-125 respectively. V_{200} and V_{150} of prostate were 22.06%, 49.20% for Cesium-131, and 22.57%, 51.38% for Iodine. UD_{10} and RD_{10} were 81.17%, 127.79% of the prescription for Cesium-131, and 82.58%, 129.44% of the prescription for Iodine. There was a decrease of 27.5% rectum RV_{100} (0.24 cc for Cesium, and 0.33 for Iodine, with a p -value of 0.05) when planning for Cesium-131 as compared to Iodine-125.

Conclusion: Cesium-131 prostate brachytherapy can provide a homogeneous dose distribution, dose coverage compared with Iodine-125 seed implant, while reducing the overall dose to the rectum. Large volume of patient studies is needed to validate this statement.