

AbstractID: 5156 Title: Permanent prostate brachytherapy using plastic palladium-103 seeds

Purpose: A new model of palladium-103 (Pd-103) seeds with plastic encapsulation (OptiSeed¹⁰³ Model 1032P, International Brachytherapy, Norcross, Georgia) is commercially available. The abstract reports the investigation of using the plastic Pd-103 seeds in prostate brachytherapy.

Method and Materials: The RTOG criteria were adopted in patient selection. A real-time transrectal-ultrasound (TRUS) guided transperineal implant technique was employed. A Foley catheter was used to localize the urethra. The seed placement followed a modified uniform loading protocol. At the completion of an implant, TRUS images were recorded. Post CT dosimetry was accomplished in the patient's 30-day follow-up visit and a seed migration survey was also performed.

Results: Three prostate cancer patients underwent the Pd-103 seed implantation. 386 loose seeds with total activity of 656.1 U were implanted. The patients tolerated the procedure. No abnormal symptoms have been reported in the first half-year follow-up, except the detection of 3 migrated seeds to the lungs in a patient. The seed appearances in the pelvic radiographs and CT images were similar to that of the metallic seeds. A significant seed enhancement was observed in the post-implant TRUS images. Phantom studies showed similar results. A post plan for each patient was generated on the post-implant TRUS images where 97% of the seeds were identified with confidence. The patterns of the seed distribution in the TRUS and CT images were similar although the GTVs were different due to implant edema.

Conclusion: Regarding the dosimetry and implant process, there are no differences between the plastic and metallic seeds. A superior property of the plastic seeds is its appearance in TRUS images. The seed distribution can be immediately displayed in the TRUS images at the completion of an implant. Cold spots can be identified in real time and additional seeds may be added so as to improve the implant quality.