AbstractID: 7240 Title: Improved Homogeneity with Fourth Generation Prostate Brachytherapy Implants – A Revised I-125 Seed Nomogram

Purpose:
Fourth generation stranded implants permit periprostatic placement of seeds with improved homogeneity across the target volume. The purpose of this study was to compare Mick nomogram seed implants with fourth generation stranded implants and determine if a revision in the activity per volume nomogram is warranted.

Methods and Materials:
Eighty-four patients who had undergone prostate brachytherapy were selected for this study and were split into two arms of forty-two patients each. The first arm, were treated in the year 2000 with loose seeds. Treatment planning for these set of patients was performed intraoperatively using a nomogram based on the volume of the prostate. The second arm, were treated in the year 2006 with stranded seeds. Pre-plans determining the number of seeds and needle loading were generated using Variseed treatment-planning system. Approximately 20 – 25 % of the seeds were implanted within the PTV in the periprostatic tissue. The prescribed dose was 145 Gy for all eighty-four patients. Also, all patients were implanted with I-125 (Model 6711) seeds with an activity of 0.497 U/seed (0.391 mCi/seed).

Results:
The total implanted activity and the number of seeds used in our stranded seed prostate implants was significantly less than that used in our loose seeds implants. Mean V100 values for the stranded seeds were greater than those for loose seeds. The stranded seeds were also associated with higher mean D90 values and lower V150-uretheral doses.

Conclusions:
We attribute this reduction in activity and the number of seeds to effectively treat the same prostate volume, to the efficient seed distribution of the stranded seeds. Loose seeds inside the prostate are subject to variable migration throughout the prostate resulting in a more heterogeneous dose distribution, while stranded seeds are systematically positioned inside the target volume resulting in a more homogeneous dose distribution.