

IPSS Score Trends for Cs-131 Permanent Prostate Brachytherapy

GEISINGER

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Abstract

Cs-131 has an implied advantage of shortening the duration of side-effects due to its shorter half-life (9.7 days) versus I-125 (59.4 days). Over 90 patients have had permanent prostate implant brachytherapy with Cs-131 seeds at Geisinger Medical Center since March 2006. Patients are routinely followed with serial IPSS scores to assess the extent of their urinary symptoms. Patients with at least 2 post implant IPSS scores been charted. Each patient's score has been normalized to the maximum value for that individual which allows a comparison of the change in urinary symptoms over the cohort of patients. By plotting the normalized score against the number of days from implant the duration of urinary acute symptoms due to the implant procedure can be visualized.

Eighteen normalized patient scores have been plotted versus time from implant. Negative times indicate pre-implant scores. 13/18 scores peaked within 5 weeks of implant (average 3.5 weeks, standard deviation 1 week). 3 patients had either level or increasing scores after 9 weeks. One patient has a peak score at 9.5 weeks. The total average of the peak scores was 7 weeks (SD 6 weeks).

Urinary symptoms for patients implanted with Cs-131 peak within 3-7 weeks of implant. The short half-life of Cs-131 contributes to a shorter duration of genitourinary toxicity for permanent prostate implant brachytherapy.

Introduction

Cs-131 was describe as far back as 1965 for use in interstitial implants with the cited advantage of low energy and reduced radiation safety hazard. Only within the past few years has this radioisotope become commercially available (Isoray, Richland, WA) for use in permanent prostate implants. Implicit with the shorter half-life of Cs-131 (9.7 days) versus I-125 (59.4 days) is a reduction in the length of post-implant urinary morbidity with disease control rates at least equal to I-125. A common method to assess urinary morbidity is the International Prostate Symptom Score (IPSS). This method uses a patient questionnaire to numerically assess urinary morbidity.

Materials & Methods

Over 100 patients have been implanted with Cs-131 at Geisinger Medical Center. Generally, they return to the clinic at 1 month post implant and then 6 month

intervals. Patients are routinely asked to fill out an IPSS questionnaire on each of their visits to the Department of Urology both before and after implant. The results were recorded in our electronic patient chart, and in the Department of Radiation Oncology's prostate implant database. Each time a new IPSS score was submitted it was recorded along with the date in the database. The database was mined for IPSS score values on 36 patients implanted with Cs-131 with at least 2 post-implant scores. Data was normalized to the maximum value of the IPSS scores in order to detect overall trends in the data. Normalized scores were plotted versus time (negative values of time reflect pre-implant dates) from implant. Average time to maximum score was calculated and averaged for the cohort.

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Discussion

The average time to maximum IPSS score was 7.3 weeks (SD 10.6 weeks). The majority of the patients (30/36, 83%) had peak IPSS scores within 6 weeks of implant. Within this subgroup, the average time to peak IPSS score was 4.5 weeks (SD 1.7). Three (3) patients (8%) had peak scores at 10 weeks or more, with one patient having a peak score over 1 year post implant. Average change in IPSS score from minimum was 10.2 (SD 9.0) with a maximum change of 32 and a minimum change of 0.

Fewer IPSS score data was available on I-125 implant patients. Scores from 13 patients who had peak IPSS scores which were neither first nor last reports were

analyzed. Average time to peak score was 64.9 weeks (SD 41.8) with a range from 4.1-140.1 weeks.

Other measures of implant success between Cs-131 and I-125 in the short term were similar. Patients with persistently elevated PSA > 1.0 at 1 year post-implant compared favorably between Cs-131 (4/13, 31%) and I-125 (20/59, 34%).

Conclusion

Urinary symptoms for the majority of patients implanted with Cs-131 peak within 3-7 weeks of implant. The short half-life of Cs-131 contributes to a shorter duration of genitourinary toxicity for permanent prostate implant brachytherapy.

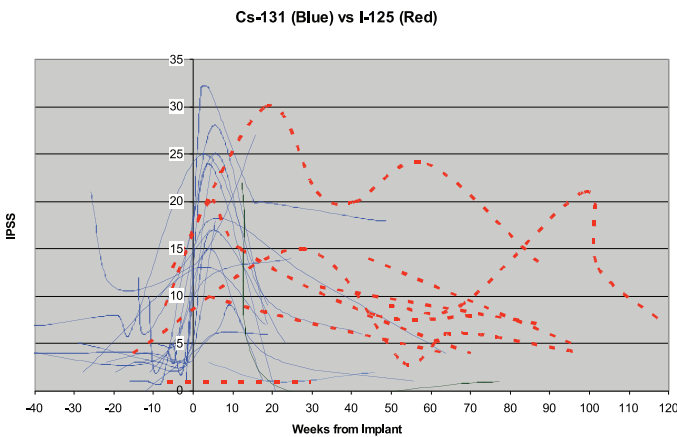


Figure 1: Plot of raw IPSS scores versus weeks post-implant showing a most peak scores for Cs-131 at less than 10 weeks. In contrast, peak scores for I-125 are much further out.

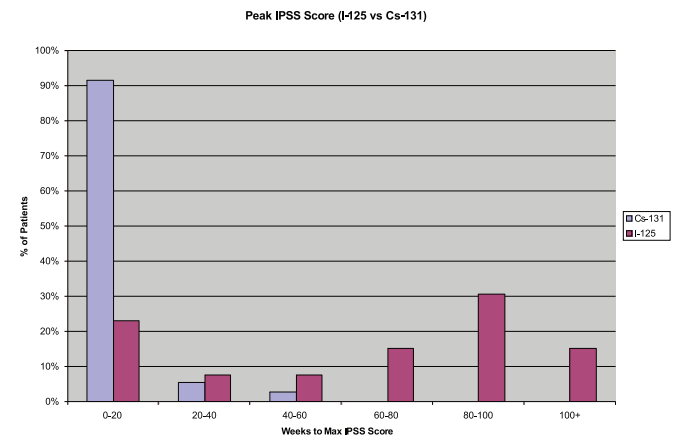


Figure 2: Percentage of patients who have peak IPSS scores at increasing times post implant. Over 90% of patients implanted with Cs-131 experienced peak IPSS scores within 20 weeks post implant. Nearly half of the patients implanted with I-125 experienced peak scores at 80 or more weeks post implant.

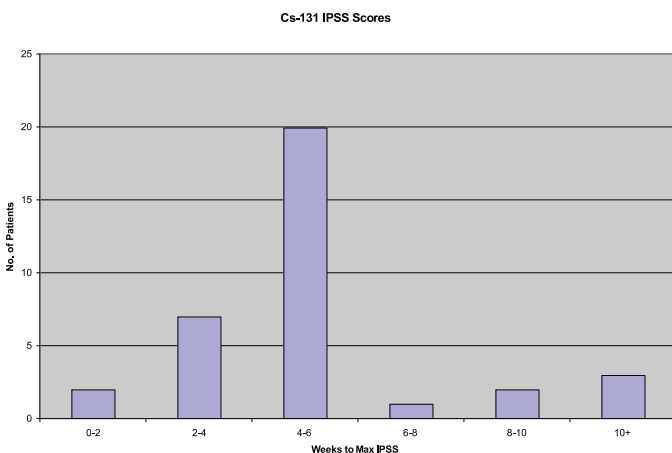


Figure 3: Peak score times for the total number of patients analyzed who were implanted with Cs-131. Most reported peak urinary morbidity at 4-6 weeks with a small number reporting peak IPSS scores at 10 weeks or longer post-implant.

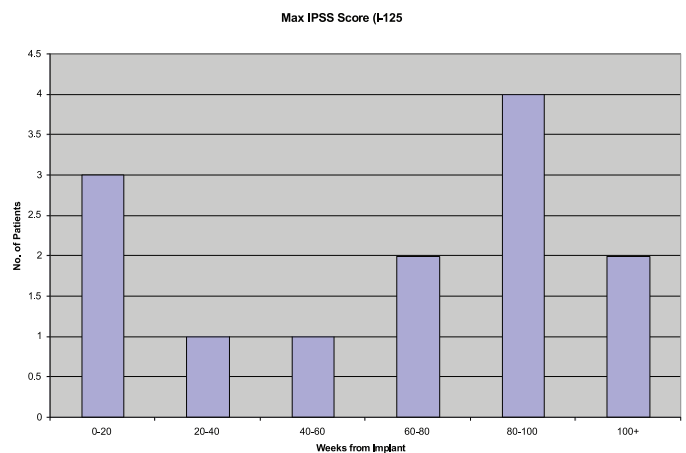


Figure 4: Peak score times for the total number of patients analyzed who were implanted with I-125. Peak scores were reported from 20 weeks to over 100 weeks post implant with the majority occurring after 40 weeks. Nearly half of the patients implanted with I-125 experienced peak scores at 80 or more weeks post implant.