

Urinary Morbidity Following Cs-131 Brachytherapy for Localized Prostate Cancer

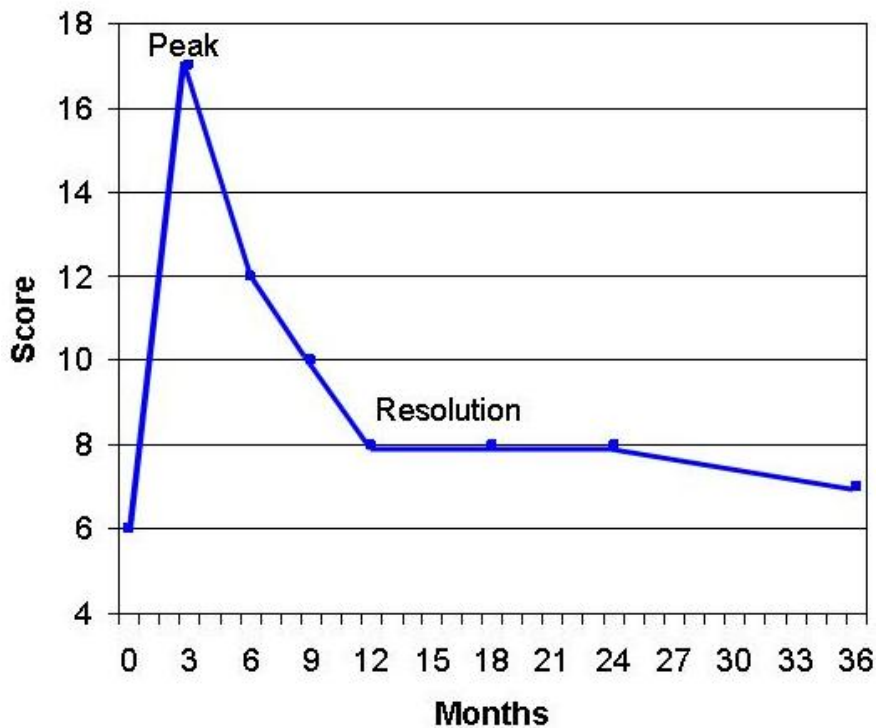
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Purpose/Objectives: Published reports detailing urinary symptoms following Iodine-125 brachytherapy demonstrate an initial peak in measured symptoms at approximately 1-3 months followed by a gradual resolution to baseline at one year or more (Figure 1)⁽¹⁻³⁾.

Figure 1. Example of Post I-125 Brachytherapy Urinary Symptom Score Population Means

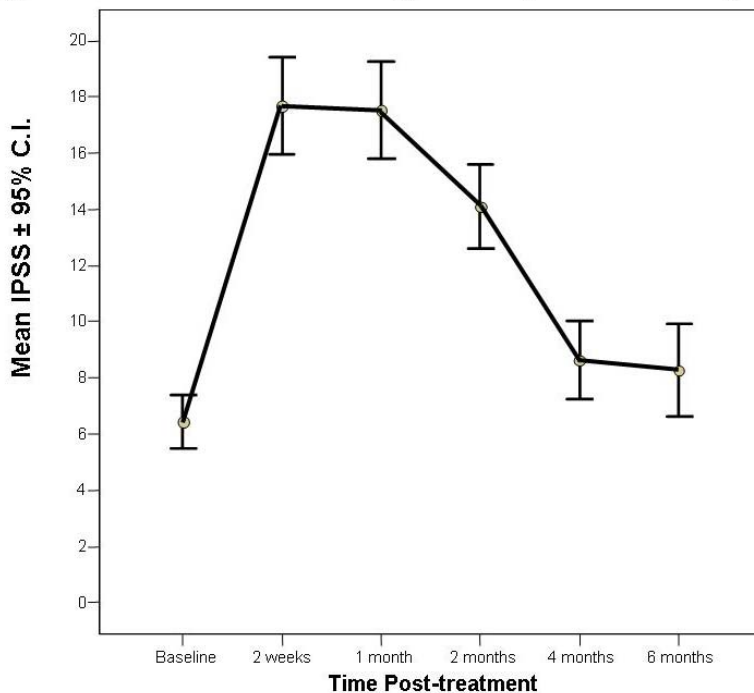


Cesium-131 (Cs-131) has recently become available for the treatment of early stage prostate cancer using permanent interstitial prostate brachytherapy. This report describes post-treatment urinary morbidity as estimated by repeat International Prostate Symptom Score (IPSS) and Expanded Prostate Cancer Index Composite (EPIC) surveys following I-125 and Cs-131 monotherapy.

Methodology: Two summaries of patient experiences are reported. For the first, 171 consecutive patients underwent Cs-131 brachytherapy by a single physician at a single out-patient center between 11/2004 and 4/2007. The second series is drawn from a prospective randomized study seeking to evaluate acute and long term quality of life parameters between I-125 and Cs-131 brachytherapy.

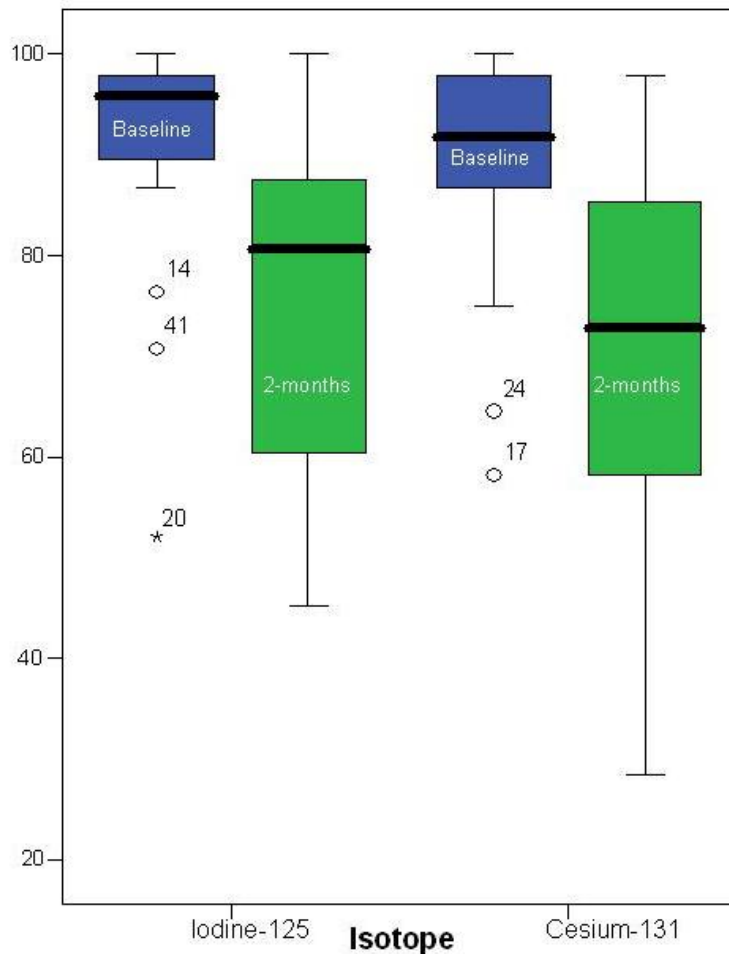
Results 1 (Single-arm): A total of 404 post-treatment IPSS scores were available for analysis. Mean IPSS scores and 95% confidence intervals are plotted in Figure 2. The mean group scores peaked at one month, and largely resolved to baseline by four months. Baseline IPSS was the only significant predictor of peak (one month) post-treatment IPSS (by General Linear Model SPSS, Inc., $p < 0.0005$). Neither pre or post prostate volume nor any dosimetric parameters were significant.

Figure 2. IPSS scores following Cs-131 prostate brachytherapy



Results 2 (Randomized): 50 patients of a planned 142 have been randomized on an I-125 (n=25) vs. Cs-131 (n=25) monotherapy protocol. Eligibility criteria included T1/T2 prostate cancer, PSA <20 ng/ml and Gleason 7 or less. The mean baseline EPIC urinary quality of life (QOL) score for I-125 was 92.1 ± 11.1 ; the mean urinary QOL score for Cs-131 was 89.5 ± 11.2 . At 2 months, mean urinary QOL score for I-125 was 75.5 ± 16.3 (-16.6 points from baseline); mean urinary QOL score for Cs-131 was 71.1 ± 19.3 (-18.4 points from baseline). Mean QOL scores at 2 months were not significantly different by t-test according to isotope ($p=0.389$) (Figure 3). Baseline urinary domain QOL score was a significant predictor of 2 month urinary QOL ($p=0.002$), while isotope was not ($p=0.591$).

Figure 3. Baseline and 2-month EPIC Urinary Domain Scores



Discussion:

From a prospective single arm cohort at our institution, it appears that urinary symptoms following Cs-131 brachytherapy, as measured by IPSS, achieve a population peak of about the same magnitude--at approximately the same time--as I-125 brachytherapy, based on historical reports. However, these data also demonstrate a possibly quicker resolution to baseline IPSS scores (4-6 months).

Randomized data from our institution reveal similar peak urinary symptoms between I-125 and Cs-131 as measured by EPIC QOL instrument at 2 months.

Continued prospective data collection on this protocol will evaluate differences in the resolution pattern between the two isotopes.

Conclusions: No matter how measured, urinary symptoms following prostate brachytherapy manifest as a peak population mean in the short term, followed by a gradual resolution to baseline.

The most significant predictor of peak urinary symptom scoring in our experience is baseline urinary score.

Iodine-125 and Cesium-131 appear to result in similar peak average mean urinary symptom scores. Ongoing study will be required in order to evaluate differences in resolution of these important side effects.

References:

1. Williams SG, et al. Factors predicting for urinary morbidity following 125-Iodine transperineal prostate brachytherapy. *Radiotherapy and Oncology*, 73: 33-38, 2004.
2. Bottomley D, et al. Side effects of permanent I-125 prostate seed implants in 667 patients treated in Leeds. *Radiotherapy and Oncology*, 82: 46-49, 2007.
3. Brown D, et al. Urinary morbidity with a modified peripheral loading technique of transperineal 125-I prostate implantation. *IJROBP*, 47(2): 353-360, 2000.