## 56 Brachytherapy Versus Brachytherapy Plus Beam Radiation for Prostate Cancer: Morbidity Outcomes from Two Prospective Randomized Multicenter Trials

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**Purpose/Objective:** To compare post-implant morbidity following brachytherapy alone versus combined with supplement external beam radiation.

**Materials/Methods:** 201 patients with 1997 AJC clinical stage T1c-T2a prostatic carcinoma (Gleason grade 2 to 6, PSA 4 to 10 ng/ml) were randomized to implantation with I-125 (144 Gy, TG-43) versus Pd-103 (125 Gy, NIST-99). In a separate, simultaneous trial, 111 patients with 1997 AJC clinical stage T1c-T2a prostatic carcinoma (Gleason grade 7 or higher and/or PSA greater than 10 ng/ml) were randomized to implantation with Pd-103 (86 versus 113 Gy, NIST-1999) with 20 or 44 Gy supplemental beam radiation, respectively. Isotope implantation was performed by standard techniques, using a modified peripheral loading pattern.

Treatment-related morbidity was monitored by mailed questionnaires, using standard American Urologic Association and Radiation Therapy Oncology Group criteria at 1, 3, 6, 12 and 24 months. Use of alpha-blockers to relieve obstructive symptoms was not controlled for, but was noted at each follow-up point. All patients reported here have a minimum one year follow-up. Statistical comparisons were made by Student's unpaired t-test at specific follow-up times.

**Results:** Patients in each treatment group were matched by pre-implant prostate volume, AUA score and coverage by the prescription isodose (V100). Post-implant AUA scores peaked at the one month point for all treatment groups and gradually declined. The difference between treatment groups was greatest at one month, when Pd-103 patients had a mean AUA score of 17 compared to 14 for the I-125 patients ($p = .02$) and 14 for patients who received supplemental beam radiation ($p = .004$). Post-implant AUA scores declined more rapidly in patients treated with Pd-103±beam radiation, with average scores having returned to baseline by 6 months. In contrast, patients treated with I-125 still had significantly elevated AUA at 12 months post-implant, with their average score being 4 pre-implant and 16 at the 12 month post-implant timepoint. Grade 1 rectal morbidity was highest in Pd-103 monotherapy patients, occurring in 30% at one month.

Grade 1 rectal morbidity resolved by 3 months in nearly all patients who received supplemental beam irradiation. In contrast, patients treated with Pd-103 alone required 6 months for resolution of rectal morbidity, while 16% of I-125 still had grade 1 morbidity at 12 months post-implant. Grade 2 rectal morbidity (intermittent bleeding) was limited to Pd-103 alone patients (9%), most marked at the one month timepoint. No patient has experienced grade 3 rectal morbidity.

**Conclusions:** The incidence and time course of post-implant urinary and rectal morbidity following prostate brachytherapy is highly dependent on isotope choice and by the use of supplemental external beam radiation

## 57 Long-Term Outcome by Risk Factors Using Conformal High Dose Rate (HDR) Boost for Prostate Cancer

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**Purpose/Objective:** To analyze the long-term outcome of patients treated with conformal HDR brachytherapy boost to the prostate when patients are stratified by risk factors for failure.

**Materials/Methods:** Between 1986 and 2000, 611 patients were treated for clinically localized prostate cancer in 3 prospective trials of external beam radiation therapy (EBRT) and dose-escalating HDR brachytherapy boost. There were 104 patients treated at Seattle, 198 at Kiel University and 309 at William Beaumont Hospital. Of the 611/177 patients received a short course of androgen deprivation (ADT). The patients were divided into 3 risk groups. Group I comprised of 46 patients had Stage ≤T2a, Gleason score ≤6, and PSA ≤10, Group II comprised 188 patients with Stage ≥T2b, GS≥ 7, and PSA ≥10, any one factor and Group III comprised 359 patients with any two risk factors. The ASTRO definition for biochemical failure (BF) was used.

**Results:** The mean follow-up time for Group I was 6.2 years (1.2-15.3), Group II was 4.4 yrs. (0.7-10.5), and Group III 5.3 yrs. (0.2-13.4). For the 611 patients, the 5 yr and 10 yr BC rates were 77% and 73%, DFS were 67% and 49% and CSS were 96% and 92%.

Biochemical control for Group I patients was 96%, for Group II 87% with no ADT and 91% with ADT and for risk III patients 69% with no ADT and 68% with ADT. The CSS at 5-yrs was 100% in Group II and no ADT and 97% with ADT. For Group III patients 97% with no ADT and 90% with ADT.

Univariate analysis for BC (Cox for continuous variables and Chi-square/logistical regression) was done by group. For Group I both univariate and multivariate analysis failed to demonstrate any correlation with failure. Most likely related to the excellent biochemical control at 96%. For Groups II/III and in the multiple regression analysis, stage, pretreatment PSA, GS, and age were significant in predicting failure. However, follow-up interval and the use of hormones did not.

**Conclusions:** EBRT with conformal HDR boost produce excellent long-term outcomes in terms of BC, DFS, and CSS in patients with prostate cancer. Even patients in the Group III, the outcomes were extremely good. Two important points can be drawn 1) conformal HDR prostate brachytherapy is a precise dose delivery system and a very effective treatment for both