

1074 Comparison of 7-Year Outcomes Between LDR Brachytherapy and High Dose IMRT for Patients With Clinically Localized Prostate Cancer

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Purpose/Objective(s): To compare the 7-year PSA relapse-free survival outcome and incidence of toxicity for patients with prostate cancer treated with I-125 brachytherapy delivered with real-time intraoperative planning (BRT) and high-dose intensity modulated external beam radiotherapy (IMRT).

Materials/Methods: Between January 1998 and May 2002, 1126 consecutive patients with low and intermediate risk prostate cancer, were treated with BRT (n = 421) and IMRT (n = 705). The median dose for the BRT group was 144 Gy and the median RT dose in the IMRT group was 81 Gy. The median ages in the BRT and IMRT groups were 66 and 69 years, respectively. Neo-adjuvant androgen deprivation therapy usage were less prevalent for BRT compared to IMRT treated patients (36% for BRT and 46% for IMRT; $p = 0.001$). PSA relapse was defined according to the nadir +2 definition, and late toxicity was classified according to NCI's Common Terminology Criteria for Adverse Events (version 3.0). The median follow-up times in the BRT and IMRT groups were 59 and 66 months, respectively.

Results: Among low risk patients (n = 672), the 7-year PSA relapse-free survival outcome for the BRT group was 98% compared to 88% for IMRT patients ($p < 0.001$). Among intermediate risk patients (n = 454), the 7-year PSA relapse-free survival outcome for the BRT group was 93% compared to 74% for the IMRT patients ($p = 0.08$). Cox regression analysis demonstrated that the following variables were predictors of improved biochemical tumor control: BRT vs IMRT ($p < 0.001$ hazard ratio (HR) 4.9); stage T1c vs T2 ($p = 0.094$ - hazard ratio 1.94); Gleason ≤ 6 vs 7 ($p < 0.01$ - HR 2.51) PSA (≤ 6.5 vs > 6.5 ($p < 0.01$ HR 2.23) and neo adjuvant-androgen-deprivation: ($p = 0.5$ - HR 0.86). Late grade 2 GI toxicities were observed in 6% and 2% of the BRT and IMRT groups, respectively ($p = 0.0002$). There were no significant differences between the treatment groups for late grade 3 or greater GI complications (1% and $< 1\%$ of the BRT and IMRT groups, respectively; $p = 0.14$). Late grade 2 GU toxicities were more often observed for BRT compared to the IMRT group (18% and 7%), respectively ($p < 0.001$). There were no significant differences between the treatment groups for late grade 3 urinary symptoms (3% and 2% of the BRT and IMRT groups, respectively; $p = 0.27$).

Conclusions: Especially for low risk patients, biochemical tumor control is superior for patients treated with BRT compared to high dose IMRT. While significant toxicities were similarly minimal for both treatment groups, a modest, but significant, increase in grade 2 urinary and rectal symptoms was noted in the BRT group compared to IMRT treated patients.

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