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## Comparison of tumor control and toxicity outcomes of high-dose intensity-modulated radiotherapy and brachytherapy for patients with favorable risk prostate cancer.

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### Abstract

**OBJECTIVES:** To compare the long-term, **prostate**-specific antigen relapse-free survival outcome and incidence of toxicity for patients with low-risk **prostate** cancer who underwent brachytherapy or intensity-modulated radiotherapy (RT).

**METHODS:** A total of 729 consecutive patients underwent brachytherapy (n = 448; prescription dose 144 Gy) or intensity-modulated RT alone (n = 281; prescription dose 81 Gy). The **prostate**-specific antigen relapse-free survival using the nadir plus 2 ng/mL definition and late toxicity using the National Cancer Institute's Common Terminology Criteria for Adverse Events were determined.

**RESULTS:** The 7-year **prostate**-specific antigen relapse-free survival rate for the brachytherapy and intensity-modulated RT groups was 95% and 89% for low-risk patients, respectively (P = .004). Cox regression analysis demonstrated that brachytherapy was associated with improved **prostate**-specific antigen relapse-free survival, even after adjustment for other variables. The incidence of metastatic disease between treatment sessions was low for both treatment groups. Late grade 2 gastrointestinal toxicity was observed in 5.1% and 1.4% of the brachytherapy and intensity-modulated RT groups, respectively (P = .02). No significant differences were seen between treatment groups for late grade 3 or greater rectal complications (brachytherapy 1.1% and intensity-modulated RT 0%; P = .19). Late grade 2 urinary toxicity occurred more often in the brachytherapy group than in the intensity-modulated RT group (15.6% and 4.3%, respectively; P < .0001). No significant differences were seen between the 2 treatment groups for late grade 3 urinary toxicity (brachytherapy 2.2% and intensity-modulated RT 1.4%; P = .62).

**CONCLUSIONS:** Among low-risk **prostate** cancer patients, the 7-year biochemical tumor control was superior for intraoperatively planned brachytherapy compared with high-dose intensity-modulated RT. Although significant toxicities were minimal for both groups, modest, but significant, increases in grade 2 urinary and rectal symptoms were noted for brachytherapy compared with intensity-modulated RT.

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