# Effect of Brachytherapy with External Beam Radiation Therapy Versus Brachytherapy Alone for Intermediate-Risk Prostate Cancer: NRG Oncology RTOG 0232 Randomized Clinical Trial

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## ABSTRACT

### PURPOSE

To determine whether addition of external beam radiation therapy (EBRT) to brachytherapy (BT) (COMBO) compared with BT alone would improve 5-year freedom from progression (FFP) in intermediate-risk prostate cancer.

### METHODS

Men with prostate cancer stage cT1c-T2bN0M0, Gleason Score (GS) 2-6 and prostate-specific antigen (PSA) 10-20 or GS 7, and PSA < 10 were eligible. The COMBO arm was EBRT (45 Gy in 25 fractions) to prostate and seminal vesicles followed by BT prostate boost (110 Gy if 125-Iodine, 100 Gy if 103-Pd). BT arm was delivered to prostate only (145 Gy if 125-Iodine, 125 Gy if 103-Pd). The primary end point was FFP: PSA failure (American Society for Therapeutic Radiology and Oncology [ASTRO] or Phoenix definitions), local failure, distant failure, or death.

### RESULTS

Five hundred eighty-eight men were randomly assigned; 579 were eligible: 287 and 292 in COMBO and BT arms, respectively. The median age was 67 years; 89.1% had PSA < 10 ng/mL, 89.1% had GS 7, and 66.7% had T1 disease. There were no differences in FFP. The 5-year FFP-ASTRO was 85.6% (95% CI, 81.4 to 89.7) with COMBO compared with 82.7% (95% CI, 78.3 to 87.1) with BT (odds ratio [OR], 0.80; 95% CI, 0.51 to 1.26; Greenwood T $P$ = .18). The 5-year FFP-Phoenix was 88.0% (95% CI, 84.2 to 91.9) with COMBO compared with 85.5% (95% CI, 81.3 to 89.6) with BT (OR, 0.80; 95% CI, 0.49 to 1.30; Greenwood T $P$ = .19). There were no differences in the rates of genitourinary (GU) or GI acute toxicities. The 5-year cumulative incidence for late GU/GI grade 2+ toxicity is 42.8% (95% CI, 37.0 to 48.6) for COMBO compared with 25.8% (95% CI, 20.9 to 31.0) for BT ($P$ < .0001). The 5-year cumulative incidence for late GU/GI grade 3+ toxicity is 8.2% (95% CI, 5.4 to 11.8) compared with 3.8% (95% CI, 2.0 to 6.5; $P$ = .006).

## CONCLUSION

Compared with BT, COMBO did not improve FFP for prostate cancer but caused greater toxicity. BT alone can be considered as a standard treatment for men with intermediate-risk prostate cancer.