

Acute Toxicity Following PSMA-Directed Focal Salvage Robotic SBRT for Local Recurrences Following Prior Robotic Prostate SBRT

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Abstract

Objectives:

The management of focal recurrences following prostate stereotactic body radiation therapy (SBRT) is an area of active clinical investigation. Focal recurrences commonly occur at the site of the dominant intraprostatic lesion (DIL). Prostate-specific membrane antigen (PSMA) PET scans with their increased sensitivity and specificity may allow for focal targeting of clinically meaningful disease. In this elderly patient population, focal SBRT may allow effective salvage treatment with fewer high-grade toxicities than whole gland SBRT. This study reports on the short-term toxicity and safety of focal salvage SBRT with PSMA targeting for locally recurrent prostate cancer after SBRT.

Methods:

This study included patients with a rising PSA and solitary focal PSMA prostate uptake after undergoing prior robotic prostatic SBRT alone (35–36.25 Gy in 5 fractions) or robotic prostatic SBRT (19.5 Gy in 3 fractions) with supplemental pelvic IMRT (45 Gy in 25 fractions). Patients were treated at Georgetown University Hospital from February 2022 to April 2023 with focal robotic SBRT to the PSMA-positive prostate (34 Gy in 5 fractions prescribed to the 83–86% isodose line utilizing the CyberKnife Radiosurgical System over 1–2 weeks), with or without adjuvant androgen deprivation therapy (ADT). Prostate biopsy was not performed and rectal spacers were not utilized. Acute urinary and gastrointestinal toxicities (≤ 3 months) were documented and scored using the RTOG criteria. Data was prospectively entered into an institutional database and retrospectively analyzed.

Results:

17 patients (11 intermediate-, and 6 high-risk) at a median age of 76 years (range, 61–90 years) received focal salvage SBRT. Two patients (12%) received additional SBRT to PSMA-positive pelvic lymph nodes (30–35 Gy in 5 fractions). The median prostate volume was 35 cc (range, 13–57 cc). Fourteen patients (82%) received adjuvant ADT (13 Relugolix, 1 Lupron). Ten patients (59%) utilized alpha antagonists prior to focal SBRT. The mean interval between the initial course of SBRT and salvage treatment was 6.8 years with a median pre-salvage PSA of 3.71 ng/ml (range, 1.4–24.7 ng/ml). The median PSA at 3 months after focal re-irradiation was 0.152 ng/ml (range, 0.006–2.97 ng/ml). One patient experienced an acute grade 2 GU toxicity (incidence of 7.7%). No acute grade ≥ 3 GU adverse events were observed. No acute grade ≥ 2 GI adverse events were reported.

Conclusion(s):

Re-irradiation for locally recurrent prostate cancer with PSMA-guided focal robotic SBRT was well-tolerated with a low incidence of short-term GU and GI toxicities. Early PSA responses were favorable. Long-term follow-up will be required to determine the efficacy and safety of this minimally invasive management approach.