

Adoption of Stereotactic Body Radiation Therapy (SBRT) for Patients with Localized Prostate Cancer in a Community-Based Practice

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Abstract

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Abstract

Objective: Prostate Cancer is the most common cancer diagnosed in males in the United States, with newly diagnosed cases around 200,000. In 2020 the mortality was around 33,000. 5-yr survival is close to 98%. Prostate cancer has been treated with multiple modalities, including radical prostatectomy, external beam (EBRT) radiation therapy, brachytherapy, and most recently, stereotactic body radiation therapy (SBRT). SBRT offers the advantage of delivering a complete course of radiation condensed into five treatments. Typically, community-based practices have experienced challenges to offer SBRT due to advanced imaging and software requirements. This study aims to assess a community-based center experience to determine feasibility and early outcomes.

Methods: This a single-institution retrospective analysis and IRB-approved project. A total of 36 Patients were enrolled from March 2018 to January 2020. Before SBRT, all patients had placement of three fiducial markers and placement of a space OAR hydrogel and underwent CT/MRI-based simulation. SBRT was delivered twice a week for 15 days. 31 patients received 36.25 Gy and five patients received 40 Gy per published protocols. Clinical and disease-related parameters including age, Stage, Gleason score, initial PSA, prostate gland size, follow-up, post-treatment PSA, and reported GI, GU, and sexual function changes as documented in the MD note. The statistical analysis was done using the chi-square test to check for potential confounding. Toxicity was reported using the CTCAE v4.0.

Results: The average patient age was 68.25 (range: 56-81), and they were followed up for a mean of two years. All patients were stage I, IIA, or IIB. 6 patients were low-risk, 24 were favorable intermediate-risk, 4 patients were unfavorable-intermediate-risk, and 2 patients were high-risk based on NCCN stratification. Gleason scores were between 6-8 (9 Gleason 6, 26 Gleason 7, and 1 Gleason 8). The average pre-treatment PSA was 7.7 (range: 2.9 -19.3). The average PSA follow-up at 1 month was 3.4 (range: 0.029-8.7) at 6 months was 1.68 (range: 0.1-4.2), at 1 year was 1.2 (range: 0.1 - 3.0), at eighteen months was 0.88 (range: 0.2 -2.3) and at two years was 0.95 (range: 0.2-2.3). GU toxicity status was divided into Grade 1 - mild with no pharmacologic intervention required and Grade 2 - requiring intervention. 7 patients were started on alpha-blockers before SBRT. 28 patients experienced mild irritative (grade 1) urinary symptoms at baseline. Baseline erectile dysfunction defined as an inability to achieve an erection sufficient for intercourse was reported in 4 patients. After SBRT, Grade 1 urinary symptoms were reported in 13 (36%) patients and Grade 2 urinary symptoms were reported in 22 (61%) patients who required alpha-blockers and 2 patients experienced urinary retention. No rectal bleeding occurred and diarrhea reported in only 2 patients - Grade 1. Erectile dysfunction was reported in 6 (17%) patients treated with PDF5 inhibitors. Retrograde ejaculation (grade 2) was reported in 2 patients. No early PSA recurrences were reported. No spaceOAR reported complications.

Conclusion: SBRT for prostate cancer appears to be a feasible and successful technique. The outcomes in our study can be compared with those reported in the literature and are acceptable. Although a high percentage of patients experienced irritative symptoms related to the treatment they responded well to alpha-blockers. This study confirms the ability to implement complex radiation techniques in a community setting.