Robotic SBRT in Prostate Cancer Patients Younger Than 50 Years Old

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Abstract

Objective: Stereotactic Body Radiation Therapy (SBRT) is a standard therapeutic option for men with prostate adenocarcinoma. The median age of prostate cancer in the US is 66 but patients as young as 35 have been reported. Many younger patients will have surgery rather than SBRT for localized prostate cancer but some will be treated SBRT. There is a paucity of data on the outcomes of this younger subset. This study reports outcomes on patients younger than 50 treated with SBRT at a single institution and compares outcome to older patients.

Methods: Between April 2006 and March 2021, 4071 patients with prostate cancer were treated with inhomogeneous-dosed SBRT and subsequently followed at an academic institution. SBRT was delivered using a robotic linear accelerator. The majority (86.44%) of patients were treated with a median dose of 3500cGy (3500-3625) over 5 fractions prescribed to the 83-85% isodose line, with other patients receiving a median dose of 4500cGy (4500-5400) to the pelvis in conventional fractionation followed by a 3 fraction SBRT boost of 2100cGy (1950-2100). Androgen deprivation Therapy (ADT) was prescribed in (23.04%) of cases. The mean age was 67.4 years old. 48 patients were younger than 50 years old (mean age 46.6) and 4,023 patients were 50 or older. Patients were divided into prognostic risk groups with 43.75%, 50.00%, 6.25% of patients falling in the low, intermediate, and high risk stratifications in the younger cohort and 24.01%, 57.59%, 18.39% in the older cohort respectively. Pretreatment PSA was 1.72 - 43.2 (median: 5.4) in the younger group and 0.3 - 661 (median: 6.5) in the older group. In the younger group, Gleason scores were < 6 in 47.92%, 7 in 47.92%, and 8-10 in 4.17%. 4 patients also received supplemental external beam radiation (median dose 4500cGy) and 5 (10.42%) patients received Androgen Deprivation Therapy (ADT) as part of their treatment regimen. In the older group, Gleason scores were < 6 in 47.92%, 7 in 47.92%, and 8-10 in 4.17%. 4 patients also received supplemental external beam radiation (median dose 4500cGy) and 5 (10.42%) patients received Androgen Deprivation Therapy (ADT) as part of their treatment regimen.

Results: At 65 months (range 4 months - 184 months) the 5-year biochemical relapse free survival was 98% in younger patients compared to 97% in older patients using the Phoenix definition of biochemical failure. The 5-year median post treatment PSA was 0.15 in the younger patients and 0.2 in the older patients.

Conclusion: This represents the largest series evaluating outcomes in very young patients treated with definitive SBRT for prostate cancer. With 5-year follow up, SBRT is an effective treatment for this subset of patients. Continued follow up will be required to see if these results remain durable.