Cureus

Health-Related Quality of Life Following Robotic Stereotactic Body Radiation Therapy for High-Risk Prostate Cancer

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Abstract
Published 03/06/2024

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Categories: Medical Physics, Radiation Oncology
Keywords: prostate cancer

How to cite this abstract
Sharma V, Collins S, Pilkin P, et al. (March 06, 2024) Health-Related Quality of Life Following Robotic Stereotactic Body Radiation Therapy for High-Risk Prostate Cancer. Cureus 16(3): a1126

Abstract

Objectives:

Stereotactic Body Radiation Therapy (SBRT) has emerged as a highly conformal and hypofractionated treatment modality, demonstrating safety and efficacy in low- and intermediate-risk prostate cancer (PCA). Traditionally, high-risk (HR) PCA has been managed with conventional fractionation external beam radiotherapy (EBRT). Such extended treatment may be burdensome to elderly prostate cancer patients. There is a dearth of long-term patient-reported outcome data for HR PCA patients treated with SBRT. This retrospective study investigates cancer control and health-related quality of life (HRQL) outcomes, specifically focusing on urinary and bowel domains, in HR PCA patients receiving Robotic SBRT.

Methods:

High-risk prostate cancer patients who underwent robotic SBRT treatment (7-7.25 Gy in 5 fractions delivered to the 77%-83% isodose line over 1-2 weeks) from December 2008 to July 2023 were included in this retrospective analysis. Biochemical failure was assessed using the Phoenix definition. Patients completed the 26-item expanded prostate cancer index composite (EPIC)-26 questionnaire at baseline, 3, 6, 12-, 18-, 24-, and 36-months post-radiotherapy. HRQOL domain scores for urinary incontinence, urinary irritative/obstructive, and bowel function were calculated following EPIC-26 scoring guidelines, with higher scores indicating improved quality of life. Kruskal-Wallis tests and Post-Hoc Dunn Multiple Comparison Tests were employed to examine significant changes within HRQL domains. Minimally important differences (MID) were calculated using 0.5 of standard deviations at baseline.

Results:

A total of 216 patients, with a median age of 75, completed the treatment, with a median follow-up of 40 months. Seventy-five percent of patients received androgen deprivation therapy (ADT) prior to radiotherapy initiation. The 3-year biochemical disease-free rate was 88%. At the initiation of radiation therapy, patients exhibited a urinary incontinence domain score of (Mean±SD) 86.04±18.6, a urinary irritative/obstructive domain score of 83.4±15.5, and a bowel domain score of 92.7±12.4. All three scores exhibited transient declines, with subsequent return to near baseline by two years post-SBRT. Three years post-treatment, the urinary incontinence domain score decreased to 84.4±19.7, the urinary irritative/obstructive domain score increased to 86.3±14.2, and the bowel domain score decreased to 90.63±14.5. These changes did not reach statistical and/or clinical significance.

Conclusion(s):

At the 3-year follow-up mark, favorable biochemical control was achieved, and patients had largely recovered to near baseline urinary and bowel function. SBRT demonstrated excellent tolerability with minimal impact on prostate cancer-specific HRQL in high-risk prostate cancer patients. These findings underscore the potential of SBRT as a convenient treatment option for high-risk PCA, offering promising outcomes and preserving patient quality of life.