

Cyberknife Stereotactic Body Radiotherapy for Prostate Cancer: The Virginia Hospital Center Experience*Robert Hong*, Robert Mordkin, Andrew Joel, Nadim Nasr, Huaying Ji, Donald McRae, Arlington, VA*

INTRODUCTION AND OBJECTIVES: The high dose per fraction of hypofractionated radiation therapy makes accurate radiation delivery of paramount importance. The CyberKnife tracks prostate motion in real time with stereotactic guidance by imaging the positions of gold fiducial seeds placed in the prostate prior to treatment planning. We report on our experience using CyberKnife stereotactic body radiotherapy (SBRT) for patients with organ confined prostate cancer to evaluate acute toxicity and initial PSA response.

METHODS: This retrospective analysis includes patients treated with CyberKnife SBRT at Virginia Hospital Center between May 2008 and July 2010. Sixty-two non-metastatic patients with a minimum of 3 months follow-up were analyzed. Twenty-seven patients were low-risk (T1b-T2a, Gleason ≤ 6 , and PSA < 10 ng/ml), 33 were intermediate-risk (T1c-T2b, with either Gleason = 7 and PSA < 10 ng/ml, or Gleason < 7 and PSA 10-20 ng/ml), and 2 were high-risk (Gleason ≥ 8 or PSA > 20 ng/ml). The prostate received 40 Gy in 5 fractions of 8 Gy. Intermediate and high-risk patients also had 36.25 Gy in 5 fractions delivered to the proximal seminal vesicles. Toxicities were recorded using the Common Terminology Criteria for Adverse Events. American Urological Association/International Prostate Symptom Score (AUA/IPSS) and PSA were recorded. Biochemical failures were assessed using the nadir+2 definition.

RESULTS: Median follow-up was 12 months (range 3 – 24 months). Median patient age was 70 years (range, 53–91). Acute toxicities were minimal with no grade 3 or higher toxicity reported. The median baseline AUA/IPSS score was 5; this increased to 10 at 3 months and stabilized at 7 by 12 months. The median pretreatment PSA was 6.1 ng/ml and decreased to 0.75 ng/ml at 2 years (see figure). One intermediate-risk patient failed biochemically at 17 months, but had a negative prostate biopsy.

CONCLUSIONS: Prostate cancer patients treated with Cyberknife SBRT exhibited minimal acute toxicity. While an increase in AUA/IPSS score occurred, all patients resume normal activities immediately following treatment and the AUA/IPSS symptoms resolve. Although longer follow-up is needed, the initial PSA response is favorable.

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