Evaluation of Outcomes after Stereotactic Hypofractionated Radiotherapy for Prostate Cancer

Giancarlo Beltramo, Isa Bossi Zanetti, Achille Bergantin,
Anna Stefania Martinotti, Livia Corinna Bianchi

Centro Diagnostico Italiano, Cyberknife Center, Milan, Italy

Objective(s): Several randomized trials support the use of high doses of radiation for localized prostate cancer. We retrospectively report collected data from a cohort of localized prostate cancer patients treated with Cyberknife (CK) in our Center.

Methods: From July 2007 through June 2016 a retrospective analysis was carried out on 217 pts with a median age of 75 years (range 52 – 86), median prostate volume of 75.6 cc (range 37.03-163.16) and clinically localized prostate cancer. CK was used to deliver fiducials based image guided Stereotactic Body Radiotherapy Treatment. The majority of pts 116 (53%) were low risk , 60 pts (28%) were intermediate risk and 41 patients (19%) were high risk (according to the NCCN criteria). Median pre-treatment PSA was 8.51 ng/ml (range 1.51- 51 ng/ml). 17 (41%) of 41 high risk pts received Androgen Deprivation Therapy. The course of radiotherapy consisted of 38 Gy over 4 fractions (9.5 Gy per fraction) given daily to the PTV. Heterogenous dose planning was used, dose was normalized to the 75% isodose line in order for the prescription dose to cover at least 95% of PTV. Real-time intrafractional motion tracking was used.

Results: With a median follow up of 61 months (range 12 – 120), the six years actuarial PSA relapse free survival rate is 94.4% (CI: 90.8%-98.2%) with 98.2% for low risk, 94.5% for intermediate and 85.6% for high risk. The patterns of PSA response show a gradual decline with a PSA nadir below 1.0 ng.ml, 12 months after the treatment.23 (10.5%) pts died during the follow up for unrelated causes, only one (0.5%) died for prostate cancer. Limited acute urinary symptoms(grade I - II) were common (46.5% of pts), no one experienced grade III or worse acute urinary symptoms. 20.3% of pts reported grade I or II acute GI symptoms, only one experienced a grade III acute proctitis. No grade IV rectal toxicity was observed. The majority of pts (78.3%) experienced grade 0 GU late toxicity, 39 (18 %) experienced grade I or II GU symptoms, 7 (3%) pts reported grade III toxicity. In one patient (0.5%) a grade IV bladder fistula was observed. The majority of pts (95%) did not experienced late GI toxicity, only Grade I or II symptoms were observed in 10 patients (4.6%), higher was not reported.

Conclusion(s): Cyberknife SBRT represents a non invasive method for the definitive treatment of localized prostate cancer with results not inferior to standard fractionated radiotherapy in terms of biochemical control rates at up to 6 years and toxicities.