

Survival Outcomes of Stereotactic Body Radiation Therapy in Locally Advanced NSCLC

Horne ZD, Karam SD, Hong RL, Duhamel D, McRae D, Gagnon G, Nasr NM

Purpose

This retrospective study aims to assess outcomes and toxicity patterns in locally advanced non-small cell lung cancer (NSCLC) patients treated with stereotactic body radiotherapy (SBRT).

Materials and Methods

A total of 43 tumors in 37 patients with median age 77.6 years (range 54-100 years) with locally advanced (Stages IIa-IV) and unresectable NSCLC received a median dose of 48Gy (range 25-60Gy) over 5 fractions (range 2-5 fractions) via SBRT for a median biologically effective dose (BED10) of 100Gy (range 37.5-132Gy) between 2008 and 2011. Of these treatments, 46.5% were salvage therapy for recurrence after surgical resection, failed chemotherapy or radiotherapy. No patients had prior radiation therapy to the same treatment area except for four patients (9.3%) who underwent a planned SBRT boost after initial treatment with intensity modulated radiation therapy (IMRT) to a dose of 50.4Gy over 28 fractions. Overall survival (OS), local control (LC), regional control (RC) and progression free survival (PFS) were estimated by Kaplan-Meier curves. Univariate analysis was conducted using Log rank test and Cox proportional hazards model.

Results

In this patient cohort, the stage distribution was: IIa 9.5%, IIb 11.9%, IIIa 45.2%, IIIb 7.1%, and IV 26.2%. The median tumor size was 3.6cm and the median gross tumor volume (GTV) was 53,813mm³. With a median follow-up of 9 months, the median OS was 12 months with an actuarial 15-month OS rate of 36%. Actuarial 15-month LC and RC rates values were 73% and 57%, respectively. The median PFS was 12 months with a 15-month PFS of 39.5%. On univariate analysis, GTV size was a positive predictor of LC rates (p=0.03) while nodal status was a negative predictor of OS (p=0.024). A trend toward statistical significance for improved regional control was observed with the addition of chemotherapy (p=0.065). Treatment was generally well tolerated, with the following subacute toxicities reported following treatment: mild fatigue was reported in 21 patients (49%), 11 patients (26%) reported slight dyspnea and chest pain, 9 (21%) reported cough, and 4 patients (9.3%) reported acute Grade 1 hemoptysis. No patients required hospitalization for management of SBRT-related side effects. There were no grade 3-5 toxicities.

Conclusions:

SBRT appears to be a safe and feasible treatment option for patients with locally advanced and metastatic NSCLC. At early follow-up, survival outcomes with SBRT appear similar to that of surgical resection. Further studies are warranted.