Survival Outcomes of Stereotactic Body Radiation Therapy in Locally Advanced NSCLC

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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 48 Gy (range 25-60 Gy) over 5 fractions (range 2-5 fractions) via SBRT for a median biologically effective dose (BED10) of 100 Gy (range 37.5-132 Gy) 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 50.4 Gy 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 3.6 cm and the median gross tumor volume (GTV) was 53,813 mm³. 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.