Cureus

Open Access
Abstract

Single Fraction SBRT for Stage I Non-Small Cell Lung Cancer: Treatment Outcomes and Effect of Tumor Location on Chest Wall Toxicity

Bindu V. Manyam [1] , Kevin L. Stephans [2] , Gregory Videtic [1] , Chandana A. Reddy [1] , Neil M. Woody [1]

1. Radiation Oncology, Cleveland Clinic 2. Department of Radiation Oncology, Cleveland Clinic

Corresponding author: Bindu V. Manyam, manyamb@ccf.org

Categories: Cardiac/Thoracic/Vascular Surgery, Radiation Oncology
Keywords: sbrt, stereotactic body radiotherapy, nsclc

How to cite this abstract
Manyam B V, Stephans K L, Videtic G, et al. (November 02, 2017) Single Fraction SBRT for Stage I Non-Small Cell Lung Cancer: Treatment Outcomes and Effect of Tumor Location on Chest Wall Toxicity. Cureus 9(11): a254

Abstract

Objectives: Two randomized Phase II trials with primary endpoints of toxicity showed single fraction (SF) SBRT for early stage peripheral non-small cell lung cancer in medically inoperable patients (pts) to be the optimal schedule after meeting pre-specified criteria for both toxicity and efficacy compared to fractionated schedules. These trials did not stratify by distance to chest wall (CW). We sought to determine CW toxicity (CWT) for SF SBRT by location in pts treated with 30 Gy or 34 Gy.

Methods: An IRB-approved prospective SBRT registry was used to identify pts treated with 30 Gy or 34 Gy in one fraction, on or off relevant protocols. Tumors were = 5 cm, node-negative, and = 2 cm from the proximal tracheo-bronchial tree. GTV was measured as abutting, = 1 cm, or > 1 cm from the CW. CWT and pneumonitis were graded according to CTCAE 3.0 criteria. Chi-square test or unpaired t-test was used to assess differences in pt and disease characteristics between the two dose groups. Overall survival (OS) was calculated using the Kaplan Meier method and compared using the log-rank test. Rates of disease failure and toxicity were calculated using the cumulative incidence method and compared using Gray's test.

Results: This study included 140 pts treated with SF SBRT to 147 lesions. 81 lesions (55.1%) were treated to 30 Gy and 66 lesions (44.9%) to 34 Gy. Median follow-up was 23.7 months (30.2 months for living pts). Pt and tumor factors were balanced between groups, except for more active smokers (34.8% vs. 19.8%; p=0.04), higher median body mass index (26.9 vs. 24.5; p= 0.01), and shorter follow up (19.2 months vs. 27.0 months) in the 34 Gy cohort. The rate of pneumonitis (any grade, 6.2% vs. 8.9%; p= 0.74) and CWT (any grade, 7.5% vs. 15.6%; p=0.17) at 2 years was not significantly different between 30 Gy and 34 Gy. CWT was 30.6% for lesions abutting the CW, 6.0% for lesions = 1 cm from the CW, and 3.3% for lesions > 1 cm from the CW. Abutment was significantly associated with CWT (p <0.0001) on UVA. Grade = 3 CWT was modest for the entire cohort (1.4%). For the 30 Gy and 34 Gy subsets, rates of local failure (7.6% vs. 12.8%; p= 0.55), distant metastasis (16.2% vs. 20.4%; p= 0.54), and OS (64.6% vs. 65.8%; p= 0.40) at 2 years were not significantly different, respectively.

Conclusions: Rates of local control, CWT, and pneumonitis do not significantly vary with SF SBRT dose. The rate of CWT is associated with distance from CW. The overall rate of CWT for SF SBRT appears similar to that reported for fractionated SBRT in randomized trials. For lesions

Open Access
Abstract
Published 11/02/2017

adjacent to the CW, the rate of CWT in this series (30.6%) does not exceed the rates in the published fractionated SBRT literature (20-33%). Our results suggest location adjacent to CW should not be a contraindication to SF SBRT.