

Stereotactic Radiosurgery for Stage I nonsmall cell lung cancer: a Multi institutional Experience

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PURPOSE:

To assess local control, overall survival, and toxicity of robotic four-dimensional, stereotactic body radiotherapy (SBRT) with respiratory motion tracking in patients with Stage I lung cancer.

METHODS:

We retrospectively reviewed patients who underwent SBRT for non-small cell lung cancer (NSCLC) between 2008 and 2011 at two different institutions. Thirty-six lesions from 35 patients with Stage I lung cancer were included. The median age was 74 with 46% females and 54% males. Forty-two percent were T1a, 25% T1b, and 33% were T2a. Sixty-nine percent were stage Ia while 32% stage Ib. The median SBRT dose was 50 Gy (range 25-75 Gy) delivered in 5 fractions (range 3-5Gy) with a median biologically effective dose (BED10) of 105.6 Gy (range 37.5-180Gy) prescribed to a mean isodose line of 81% (range 74-94%).

RESULTS: With a median followup of 13.5 months, the 2-year local control, progression-free survival, and overall survival rates were 80%, 43%, and 73% respectively. Two-year regional and distant control rates were estimated at 54% and 77%, respectively. Univariate analysis revealed that a BED10 greater than 105 was predictive of local control ($p=0.0268$) while size, measured as gross tumor volume (GTV), was predictive of overall survival ($p=0.0021$). Although the number of events was small, there was a statistically significant difference in local control favoring adenocarcinoma ($p=0.0396$). Subacute side effects included cough in 2 patients (5.6%), fatigue in 8 patients (22.2%), chest pain in 4 patients (5%), and shortness of breath in 5 patients (13.9%). There were no RTOG grade 4 or 5 toxicities reported.

CONCLUSIONS:

The SBRT protocol used in this study yielded reasonable local control and overall survival rates with acceptable toxicity for patients with stage I NSCLC. The effects of total dose, fractionation, and histology on control rates require further investigation.