

Re-irradiation of Locoregional Recurrence NSCLC using Robotic Stereotactic Body Radiotherapy

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Abstract

Objectives: Intrathoracic recurrence of non-small cell lung cancer (NSCLC) after initial radiotherapy still occurs at a high incidence, although tumor control has improved with the improvement of radiotherapy techniques and the increase in dose delivered to the tumors. There is limited data on the use of SBRT in re-irradiation of lung tumors by toxicity concerns and lack of robust evidence and dose agreement. In this study, we evaluated the efficacy, toxicity and dose responses of re-irradiation with robotic SBRT for in field recurrence of NSCLC patients after previously irradiated with conventional, conformal, IMRT/VMAT or SBRT.

Methods: From November, 2005 to April 2015, 49 patients who had previous definitive radiation treatment for primary site of NSCLC were underwent SBRT by CyberKnife in our center. Locally recurrent disease was diagnosed by CT, PET/CT and/or biopsy. Twenty-eight patients with thirty-six in-field recurrence/persistent lesions were included in this study while the remaining patients were excluded because lack of at least four months follow-up time and distant metastases by PET/CT-Brain MR. Previous median CTV and GTV radiation doses were 54 and 65,72 Gy and a median 15 month interval between previous radiotherapy and CyberKnife SBRT, respectively. The median follow-up time of after SBRT was 9 months (3-52). To evaluate SBRT effectiveness, median local control, overall survival, and treatment related toxicity were reported.

Results: Patients characteristics were: 24 males and 3 females; the median age of patients was 64 years. SBRT doses and fractionation ranged from 60 to 30 Gy and from 3 to 8 according to previous doses, location of recurrence and interval time of recurrence. The median SBRT dose was 30 Gy in 5 sequential days. Sixteen of patients received chemotherapy during to SBRT. %65 of recurrence tumor location was overlapping with previously treatment field while %35 of recurrence tumor location was outside the previous treatment field. Two patients had local progression after SBRT at their first follow-up imaging. The local progression-free survival was %71.4 at 1 year and %46.4 at 2 years. No grade 3 or higher toxicities were observed.

Conclusions: The treatment options of patients who had recurrent lung cancer are limited. Robotic SBRT is a tolerable option which can be used with radical or palliative intent for carefully selected patients who had locally recurrent tumor after previously irradiated with manageable toxicity.

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Abstract

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