Stereotactic Body Radiotherapy re-irradiation of intrathoracic recurrence of lung cancer

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INTRODUCTION

- Stereotactic body radiotherapy (SBRT) achieves excellent local control with low toxicity for patients with Stage I primary lung cancer in multiple prospective trials.[1]
- There are limited data regarding efficacy and toxicity of SBRT as re-irradiation for patients with an intrathoracic recurrence of lung cancer after primary conventional radiotherapy (RT) or SBRT.

HYPOTHESIS/GOAL

- The aim of this study is to examine the outcome of re-irradiated lung cancer patients using SBRT in terms of overall survival, failures, and toxicities.

MATERIALS & METHODS

- We performed a retrospective review of patients treated with SBRT as definitive treatment for intrathoracic recurrence of primary lung cancer after conventional RT or SBRT.
- Patients were evaluated for overall survival, and acute toxicity.
- Analysis was performed using a Kaplan-Meier Curve.
- Factors that influenced overall survival were analyzed using log rank
- Patients were excluded if primary and re-irradiation treatment were not performed on the thorax
- This protocol was approved by the IRB at East Carolina University.

RESULTS

- We examined the records of 1,110 patients who received SBRT between 2009 -2020. Of those, we identified 73 patients treated with definitive SBRT at our institution for intrathoracic failure of primary lung cancer after prior conventional RT or SBRT.
- The median overall survival rate for these 73 patients was 22 months
- On a univariate analysis, overall survival was not significantly influenced by factors such as gender, smoking history above 20 pack years , GTV above or below median of 7.45 cc, PTV above or below median of 18 cc, and ipsilateral lung radiation (Table 2).
- Overall, 20 patients reported acute adverse effects immediately after treatment. No patient developed grade 2 or higher toxicities after second SBRT (Table 1).
- There were two patients that died within a month of re-irradiation treatment. One had a likely unrelated cardiac event with chest pain that predated SBRT re-irradiation. The second patient died of an unknown cause.

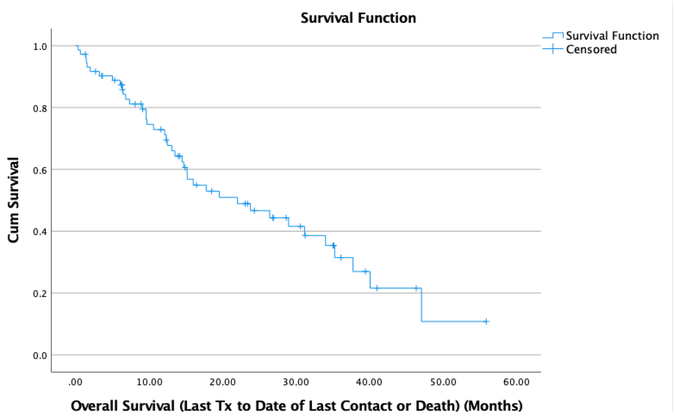

Figure 1. Overall survival of the SBRT re-irradiated patients, N = 73

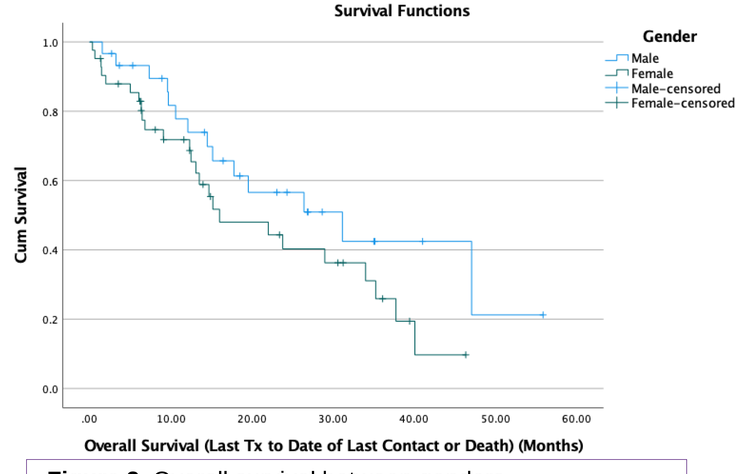

Figure 2. Overall survival between genders

Toxicities	Number of Patients
Grade 1 Fatigue	12
Grade 1 Rib Pain	3
Pneumonitis	1
Grade 1 Cough	1
Grade 1 Radiation Dermatitis	1
Cardiomegaly	1

Table 1. Acute toxicities reported after immediately treatment

Factor	p-value
Gender	0.12
Smoking Pack History	0.87
Median GTV	0.43
Median PTV	0.34
Same Lung Re-irradiation	0.88

Table 2. Univariate Analysis of factors that may affect overall survival

DISCUSSION

- Limitations of this study include patients with short follow ups, the retrospective nature of this study, and the lack of availability of records to assess toxicity
- Another issue faced in this retrospective review, as well as in similar studies, was the difficulty in correctly diagnosing tumor recurrence on image-based studies.[1]
- The overall survival in our study (22 months) compared favorably with historical results reported in similar publication. [2]

CONCLUSION

- SBRT re-irradiation of intrathoracic recurrence of lung cancer after prior radiation therapy offers appears effective with acceptable toxicity.
- Further analysis will be done on local control, late toxicities and areas with treatment overlap to assess significance

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