

Theme: Clinical

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Prospective study of proton beam therapy for lung cancer patients with interstitial lung disease

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Purpose

- This prospective study aimed to assess pulmonary toxicity following proton beam therapy (PBT) for non-small cell lung cancer (NSCLC) with interstitial lung disease (ILD)

Methods

- Inclusion criteria: patients 1) with histologically or clinically confirmed NSCLC and confirmed ILD, 2) treated with definitive PBT from June 2020 to August 2023
- Final cohort: 46 patients
- Dose scheme was individualized according to stage and location
- Primary endpoint: grade ≥ 3 pulmonary toxicity (G3+) according to CTCAE v5.0
- Secondary endpoints: change in pulmonary function, OS, PFS, and Locoregional control

Results

Table 1. baseline characteristics

Variables		
Age	Year	71 [67-76]
Sex	Male	45 (97.8%)
CCI	Score	4 [3-5]
ILD type	IPF	41 (89.1%)
	CPFE	2 (4.3%)
	Others	3 (6.5%)
GAP index	0-1	0 (0%)
	2-3	9 (19.5%)
	4-5	32 (69.6%)
	>5	5 (10.9%)
Baseline FVC	%	71.5 [65.0-82.0]
Baseline FEV1	%	81.0 [67.0-87.0]
Baseline DLCO	%	47.5 [36.0-57.0]
Clinical stage	I	28 (60.9%)
	II	9 (19.6%)
	III	9 (19.6%)
CCRT	Yes	10 (21.7%)
BED(a/b=10)	GyE	115.2 [80.5-115.2]
PTV	cc	99 [57.8-232.4]
Lung Vs5	cc	2412[1978-2879]
Lung Dmean	GyE	3.4 [2.5-5.3]
Lung V5	%	10.4 [8.7-17.1]
Lung V10	%	8.7 [7.3-15.0]
Lung V20	%	6.8 [5.7-11.1]

V5; absolute volume spared from a 5 GyE dose, Dmean; mean dose

Figure 1. Incidence of G3+

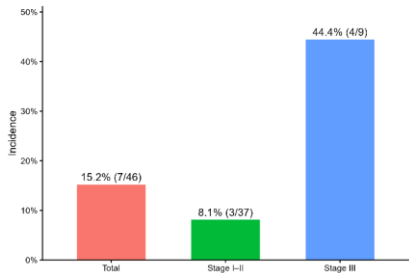


Table2. Predictive factors for G3+

Variables	OR (95% CI)	P
PTV ($\leq$ vs. >111 cc)	12 (1.8-240)	0.04
Lung Vs5 ($\leq$ vs. >2544 cc)	0.1 (0.0-0.7)	0.02

Figure 2. Pulmonary function change over time after PBT

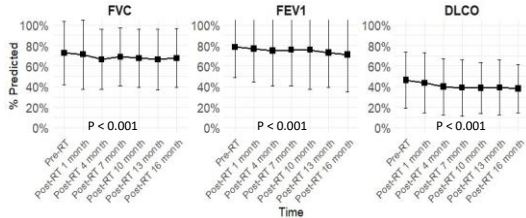


Figure3. Kaplan-Meier curves for treatment outcomes

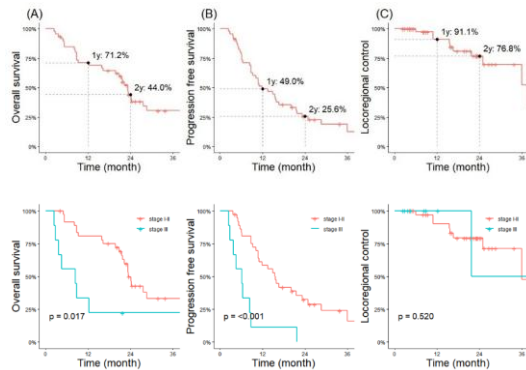


Table3. Prognostic factors for OS

Variables	HR (95% CI)	P
Baseline FVC (continuous)	0.9 (0.9-0.9)	0.01
Lung Dmean ($\leq$ vs. >3.9 GyE)	3.3 (1.5-7.5)	0.02