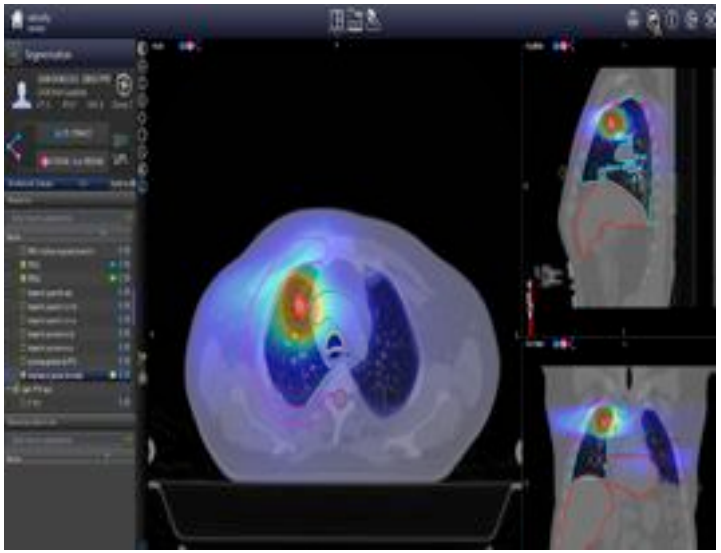
Malignant lung nodules treated with Stereotactic Body Radiotherapy (SBRT): a single Institution experience



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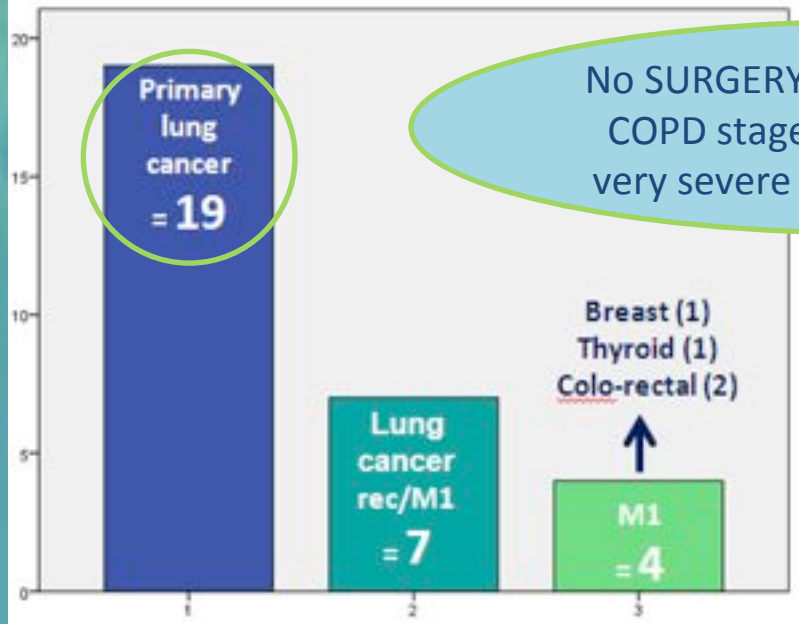
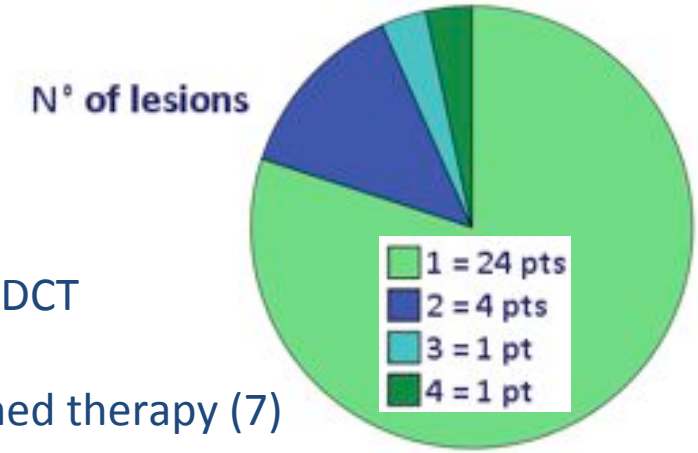
Methods and Materials

- From 07/2011 to 10/2013 → 30 pts
- Median age: 74 years (range: 42-89); 21/30 pts > 70 years



No SURGERY (comorbidity): 12/19
COPD staged from moderate to very severe (GOLD classification).

- CT scan = 30/30; FDG-PET/CT = 27/30
- Diagnosis: radiological in 20 pts and both histological and radiological in 10 pts.



- Planning data acquisition: diaphragmatic compression; 4DCT
- PTV volume ranged from 11 to 177 cc
- RT-technique: Tomotherapy (5), VMAT (18), arc-conformed therapy (7)
- Daily IGRT control
- Fractionation schedule:
  - 55 Gy in 5 fractions in 24 pts (BED 115Gy)
  - 52 Gy in 8 fractions in 6 pts (BED 85Gy)

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Results – Toxicity

- Median follow-up: 12 months (range 6-28)

	RTOG Toxicity	G0	G1	G2	G3	G4
Acute	Lung	19	3	4	4	/
	Esophagus	27	/	3		
Late	Lung	20	2	5	2	1
	Chest wall	27	/	3		
	Esophagus	30				
	Heart	30				
	Brachial plexus	30				

NB: 28/30 pts with patchy radiographic appearances (G2) or dense radiographic changes (G3)

2 pts with severe symptomatic fibrosis and 1 patient required intensification of continuous oxygen therapy

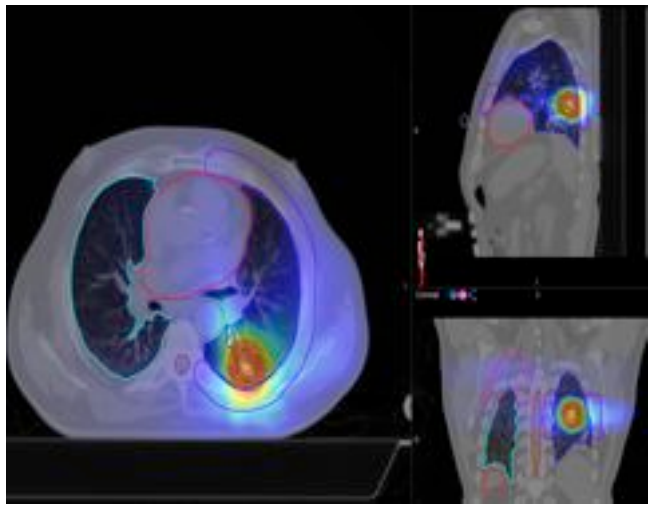
4 pts had steroids for clinical and radiological evidences of acute pneumonitis

STEREOTASSI POLMONE CONSTRAINTS

Nome e Cognome		n° cartella	
Dose totale			
Dose frazione			
n° frazioni			

Volume totale PTV (cc)			
PTV	Gy	% della dose tot. prescritta	Richiesta
D99%			>90% della Dtot. prescritta
D98%			
D95%			100%
D2%			

OAR	Constraint calcolato	Richiesta
Cuore Dmax	Gy	<27Gy
Esofago Dmax	Gy	<27Gy
Polmone omolat. Dmedia (escluso PTV)	18,1 Gy	<9Gy
Polmone controlat. Dmedia		
Polmoni V20 cumulativa – PTV	18 %	<22%
Midollo Dmax	Gy	<21,35Gy
Trachea e bronchi Dmax	Gy	<32Gy
Plesso brachiale omolat. Dmax	Gy	<27Gy
Grosso vas V47	cc	<10cc
Parete toracica V30	cc	<30cc
Fegato V15	cc	<700cc



- The patient with 4 lesions (PTV cumulative volume of 177cc) had G3 lung AT and LT and the worst lung-DVH of the series.
- 3 pts developed chronic moderate chest wall pain.

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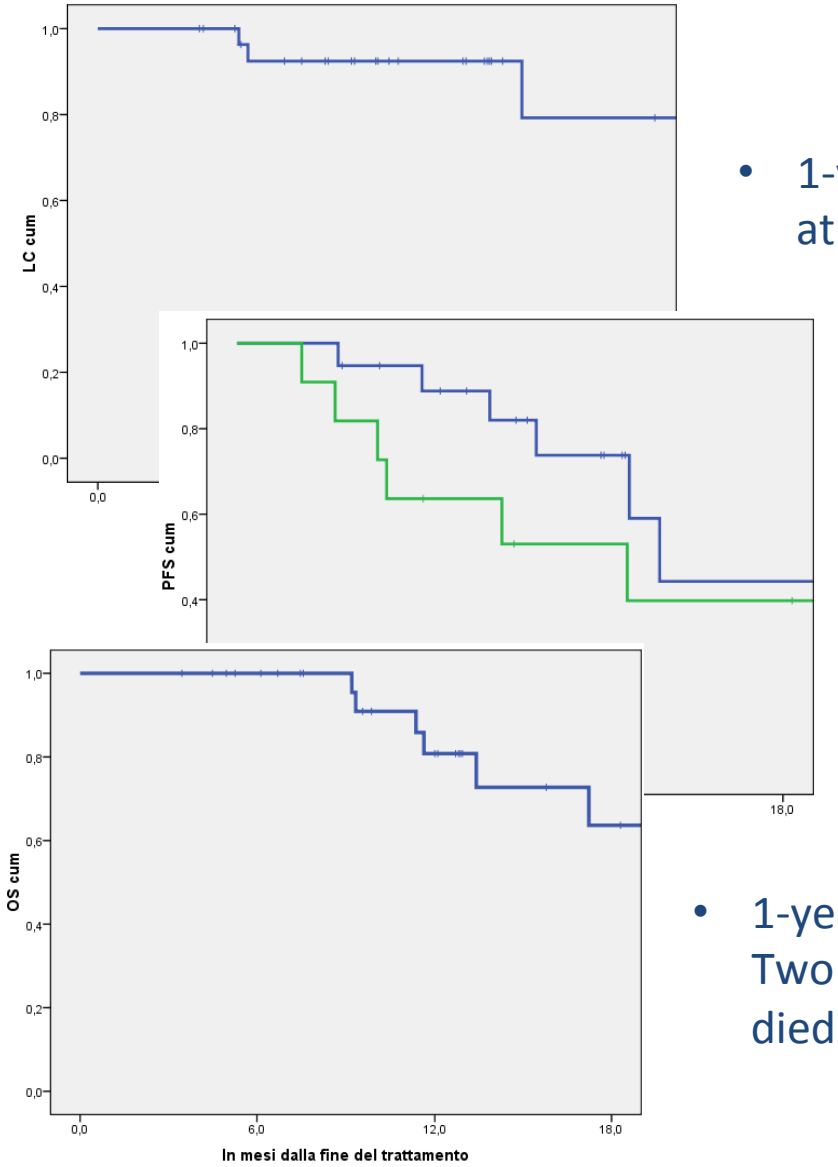
Results – Survival



- 1-year LC was 92%, with only 3 disease progression at the SBRT site.

- Among pts with **primary lung cancer** 1-year PFS was 74%, with 4 mediastinal and 2 systemic recurrence.
- Among pts treated for **metastatic disease** 1-year PFS was 53%; only 1/6 progression was at the SBRT site.

- 1-year OS was 81%. Median OS was 28 months. Two patient died for disease progression and 5 pts died for other causes.

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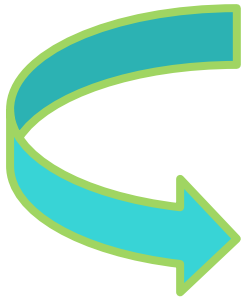
Conclusions

- SBRT technology is extremely useful for malignant lung nodules: **primary unfit for surgery or metastatic**.
- During the respiratory cycle, lung tumors have been observed to move along all directional axes: **4-dimensional (4D) CT** imaging technology and **diaphragmatic compression** accieve satisfying target delineation/pts immobilization.
- **cone-beam CT** allows to directly visualize the lesion at the time of treatment reducing the risk of inaccuracy



Pts can expect a **high rate of local control and lung cancer–specific survival with minimal toxicity** as long as anatomic constraints are respected and quality-assurance protocols for reliable immobilization, accurate tumor targeting, and precise verification of dose delivery are followed

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Grazie per l'attenzione