

## Background

Malignancies rank the third cause of death after solid organ transplantation. Lung cancer is reported to be 20-25 times higher in transplant patients compared to general population with an incidence of 0,1-4.1 % in lung and heart transplant recipients. Potential contributory factors are the increasing age (recipients and donors), smoking history and immunosuppressive treatment. Lung cancer can be transmitted from the donor to recipient, in the explanted lung or newly-formed lung cancer, either in the graft after bilateral transplantation or in the native lung in those who underwent unilateral transplantation.

## Methods

The aim of our retrospective study was to evaluate the prevalence, origin, management and outcome of lung cancer in all patients who underwent lung transplantation in 2010 till 2019 in our institution.

## Results

From 343 transplanted patients in 2010-2019 lung cancer was detected in 12 (3,5 %) patients, predominantly in men 91,7 %.

The median age of donors in patients with lung cancer was  $50.75 \pm 9.99$ , insignificantly to median age of all donors  $43.13 \pm 15.43$ .

Unexpected neoplasm in explanted lung occurred in three patients after double lung transplantation. Three patients after single lung transplantation developed lung cancer in the native lung. One patient was an extended lung cancer donor recipient. Five lung cancer developed de novo.

91,7% lung tumors were non-small-cell lung cancer. 50 % represented squamous cell carcinomas and adenocarcinomas. Four patients (33,3 %) underwent surgery. One patient profited from radiorobotic surgery procedure. One patient was cured by chemotherapy. The rest were followed up and treated palliatively.

The primary tumor was the main cause of death in five patients (41,7 %) and one patient passed away due to infection (Table 1).

Table 1 Prevalence of lung cancer in lung transplant recipients

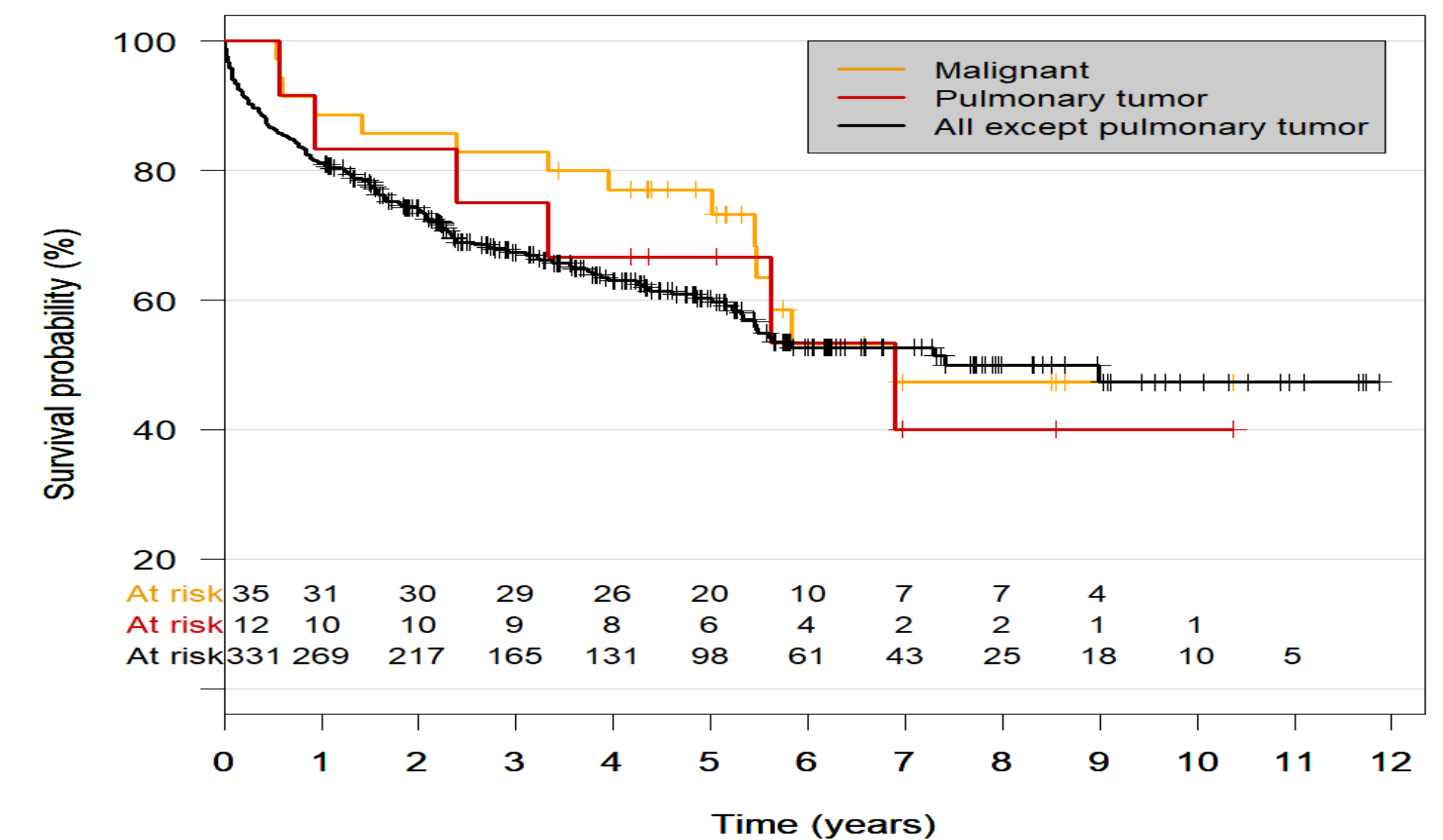
Sex/age	Dg	Origin	Histology	TNM	Stage	Treatment	Outcome
M/62	IPF	Donor	No verified	pT1cNxM1b	IVA	symptomatic	died
M/51	IPF	Explanted	Neuroendocrine	pT1aN0M0	IA	symptomatic	died
M/51	COPD	Explanted	Adenocarcinoma	pTisN0M0	0	symptomatic	alive
M/63	COPD	Explanted	Adenocarcinoma	pT1aN0M0	IA	symptomatic	alive
M/64	IPF	Native	Squamosa	pT1bN0M0	IA	Surgery	died
M/69	IPF	Native	Squamosa	pT1aN0M0	IA	symptomatic	died
M/65	IPF	Native	Squamosa	pTxNxM1a	IVA	Surgery	died
M/57	COPD	De novo	Mucoepidermoid	pT1bN0M0	IA	Surgery	alive
M/49	IPF	De novo	No verified	pT1aN0M0	IA	Radiotherapy	alive
F/33	CF	De novo	Hemangioendotelioma	x	limited	Chemotherapy	alive
M/68	IPF	De novo	Mucoepidermoid	pT2aN0M0	IB	Surgery	alive
M/65	COPD	De novo	Adenocarcinom\	pTxNxM1b	IVB	symptomatic	died

The median of time from transplantation to cancer diagnosis was  $2.12 \pm 2.57$  years.

Immunosuppression was reduced in seven patients (58,3 %).

The overall median survival as a date of transplant to date of death in recipients with lung cancer was 6,89 [3,32, NA] years.

Survival rate was 83,3% [95 %CI 0.643-1.00], 75 % [95 %CI 0.541-1.00], 66,7 % [95 %CI 0.447-1.00] in 1, 3 and 5 years after LTx (Graf 1). The median survival time in patients without malignancy was insignificantly shorter.



Graf 1 Kaplan-Meier Survival rate in 1,3,5 years after lung transplantation

## Conclusion

Lung cancer in lung transplant recipients remains rare. The screening protocol after solid organ transplantation play a significant role in prevention of any malignancy, including lung cancer. The optimal immunosuppression treatment after diagnosed malignancy is still missing. Lung cancer was not associated with an overall decrease in survival time.