Standardizing and Improving the Classification for *Cause of Death* Post Lung Transplantation

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INTRODUCTION

There is limited data describing accurate causes of death in lung transplantation **(LTx)**. Registries fall short with regard to nomenclature and accuracy. The aim of this study is to evaluate and describe a new model for *Cause of Death* or re-transplantation **(Dth/ReLTx)** for lung transplant recipients at our institution.

METHODS

Data were retrospectively collected from all Dth/ReLTx patients who underwent lung transplantation 2007-2013 (inclusive). To categorize Dth/ReLTx, information was obtained from online medical records, lung function parameters, post-mortem reports, imaging and microbiological results.

RESULTS

Patients included for analysis were those followed up at the Alfred (Dth ≥90 days). 2 cases with unknown causes of death were excluded.

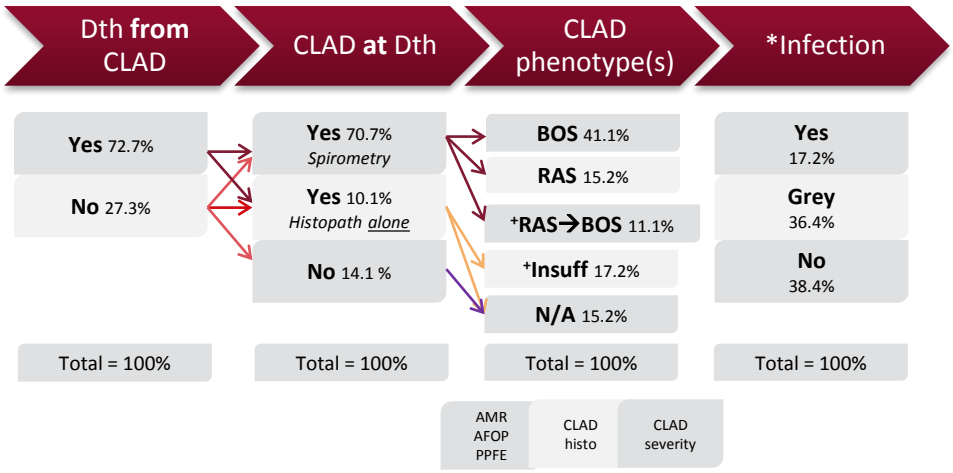
All LTx	2007	2008	2009	2010	2011	2012	2013	TOTAL
Total LTx	35	47	55	62	79	59	70	**407**
Alfred follow up	23	37	42	52	65	43	53	**315**
Single-LTx	5	4	6	6	8	2	2	**33**
Heart-LTx	0	1	0	1	0	0	0	**2**
Bilateral-LTx	18	32	36	45	57	41	51	**280**
Non-Alfred follow up	12	10	13	10	14	16	17	**92**

Table 1a: Lung transplantation at the Alfred 2007-2013

BSLTx	2007	2008	2009	2010	2011	2012	2013	TOTAL
Dth	8	14	14	15	20	13	15	**99**
Malignancy								
Haem	1		1	3	1		1	**7**
Non-Haem	1		1		2		1	**5**
ReLTx	1	3	2	8	4	1	2	**21**
Total	9	17	16	23	24	14	17	**120**

Table 1b: BSLTx patients followed up long-term at the Alfred

Current analysis focuses on Dth patients who received bilateral sequential lung transplants. Data are represented in the following flow diaphragm, which also illustrates our new classification system.



***** **Yes** = respiratory infection directly involved in cause of Dth (either solo cause or co-primary cause); **Grey** = respiratory infection within 3/12 of Dth OR associated with late-stages of graft decline; **No** = no respiratory infection within 3/12 of Dth or not thought to be related to late graft decline

+ **RAS→BOS** = RAS at BOS1, BOS at Dth; **Insuff** = insufficient spirometry

Examples

P1	Yes	Yes (spiro)	BOS	Definitely
P2	Yes	Yes (histo)	Insuff	Grey area

P1: 56 M, BSLTx for idiopathic bronchiectasis, Dth at day 731, multi-resistant pseudomonas and copious secretions through Tx life.
P2: 19 F, BSLTx for CF, Dth at day 192, early infiltrates and DSA, post mortem lung tissue PCR +ve for Parainfluenza, histopathology DAD and OB

FUTURE DIRECTIONS

- Analysis of associations between each component of *Cause of Death*, including the severity of physiological impairment from CLAD. Are there significant trends which shape specific *Cause of Death* "phenotypes" in our lung transplantation population?
- Description of Dth in our LTx cohort from *Acute Lung Allograft Dysfunction* (ALAD); rapidly progressive respiratory failure, clinical deterioration and ultimately death in a previously healthy LTx recipient (<3 weeks of graft dysfunction).
- Prospective data collection (starting January 1 2018) of all Dth and ReLTx patients at the Alfred as per our new classification system.

CONCLUSION

This evolving comprehensive classification of *Cause of Death* identifies for all patients: 1) the presence of CLAD, 2) CLAD phenotype/s, 3) CLAD severity, as well as the association with concomitant respiratory infection. These factors are key for further studies where Dth or ReLTx is an outcome.

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