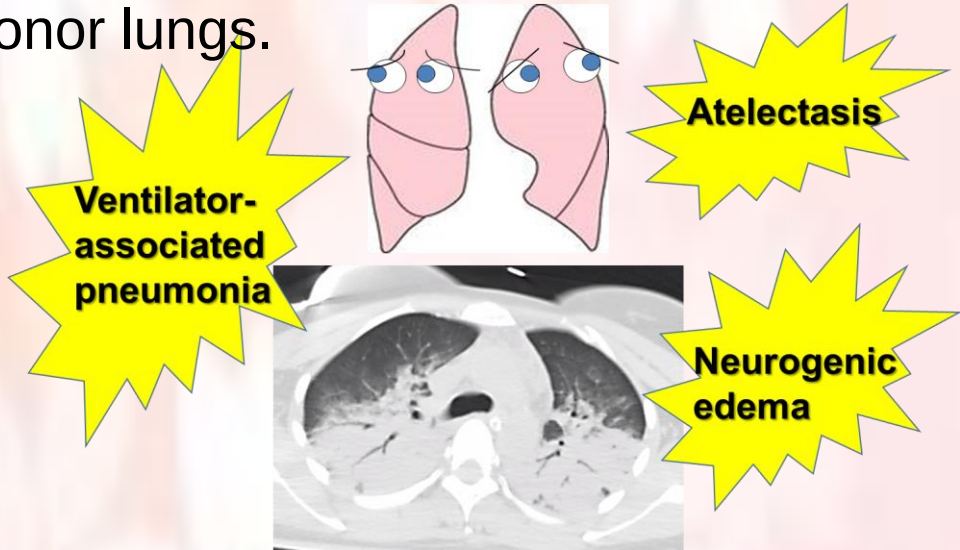


Background

- Prolonged mechanical ventilation can impair brain-dead donor lungs.
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- Because subjects mechanically ventilated for more than 5 days are generally considered as marginal and declined as donors for lung transplantation (LTx), the outcomes of LTx from these donors remains unknown.

Objective

To compare the outcomes of LTx from donors mechanically ventilated for a short term (<5 days) and those mechanically ventilated for a long term (≥5 days), and investigating the feasibility of LTx from donors mechanically ventilated for a prolonged period

Methods

We retrospectively investigated the data of 31 patients who underwent LTx from donors mechanically ventilated for a short term (<5 days; ST group) and those of 50 patients who underwent LTx from donors mechanically ventilated for a long term (≥5 days; LT group).

Results

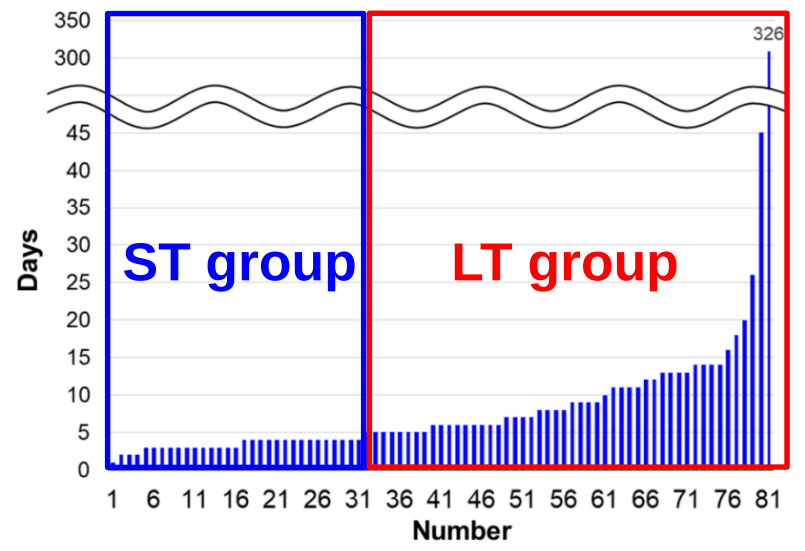
- Median duration of mechanical ventilation of the lung donors was 3 (range, 1-4) days in the ST group and 8.5 (range, 5-326) days in the LT group ($p<0.0001$).
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- Despite the prolonged ventilation in the LT group, the lung donor score and the donor characteristics of the LT group were similar to those of the ST group.

Table 1. Donor characteristics

Variables	Short-term group (n=31)	Long-term group (n=50)	p-Value
Age (years)	47.2±14.1	42.3±15.8	0.16
Gender, Male/Female	16/15	31/19	0.37
BMI (kg/m ²)	23.0±5.4	23.2±5.5	0.87
Smoking history, yes	16 (51.6%)	27 (54.0%)	1.00
Cause of death			
Intracranial bleeding	19 (61.3%)	28 (56.0%)	0.82
Hypoxic brain injury	4 (12.9%)	11 (22.0%)	0.39
Traumatic brain injury	6 (19.4%)	8 (16.0%)	0.77
Cerebro-vascular accident	2 (6.5%)	2 (4.0%)	0.63
Other	0	1 (2.0%)	1.00
Chest CT assessment	18 (58.1%)	36 (72.0%)	0.23
PaO ₂ /FiO ₂	414.1±99.6	434.0±117.6	0.44
Lung donor score	6.2±2.9	5.7±3.1	0.52
Age score	1.2±1.2	0.8±1.1	0.16
Smoking history score	0.4±0.6	0.3±0.6	0.41
Chest X-ray score	1.4±0.9	1.3±1.0	0.95
Secretions score	1.0±0.5	1.3±0.5	0.021
PaO ₂ /FiO ₂ score	2.2±2.2	2.0±2.3	0.66
EVLP use	0	1 (2.0%)	1.00

- The recipients were clinically similar in the two groups.

Table 2. Recipient characteristics

Variables	Short-term group (n=31)	Long-term group (n=50)	p-Value
Age at LTx (years)	40.3±13.7	37.5±15.1	0.42
Gender, Male/Female	13/18	25/25	0.50
Diagnosis			
IP	11 (35.5%)	14 (28.0%)	0.62
PH	5 (16.1%)	9 (18.0%)	1.00
Pulmonary GVHD	3 (9.7%)	8 (16.0%)	0.52
Bronchiectasis	1 (3.2%)	6 (12.0%)	0.24
Emphysema	2 (6.5%)	5 (10.0%)	0.70
LAM	4 (12.9%)	4 (8.0%)	0.47
Other diseases	5 (16.1%)	4 (8.0%)	0.29
BMI (kg/m ²)	18.6±4.8	19.2±3.9	0.60
LAS	38.6±5.5	38.4±6.7	0.59
Waiting time (days)	721.1±497.3	835.6±747.3	0.46
Double LTx	22 (71.0%)	38 (76.0%)	0.61
CPB use	24 (77.4%)	36 (72.0%)	0.79
Total ischemic time (min)	479.1±118.7	515.1±131.0	0.22

- There was no significant difference in the incidence of primary graft dysfunction in the two groups.

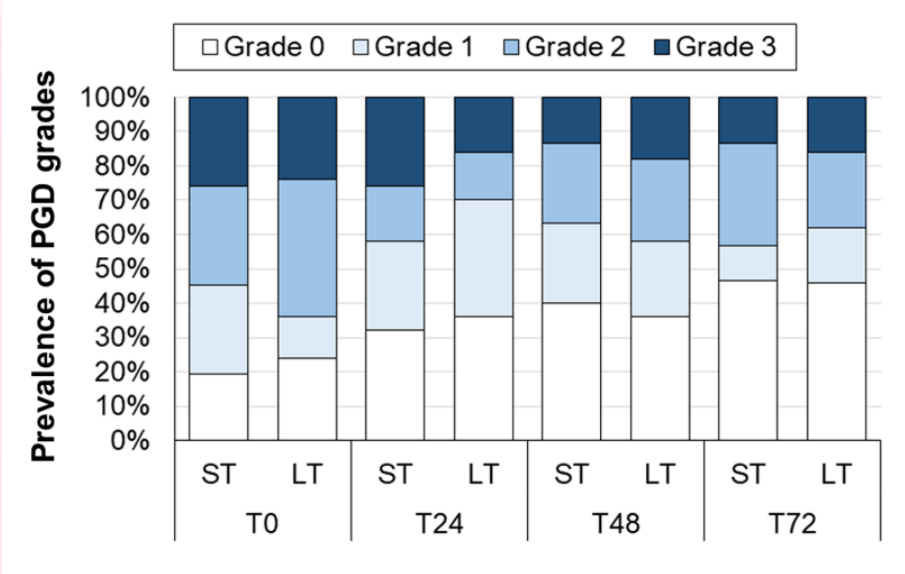
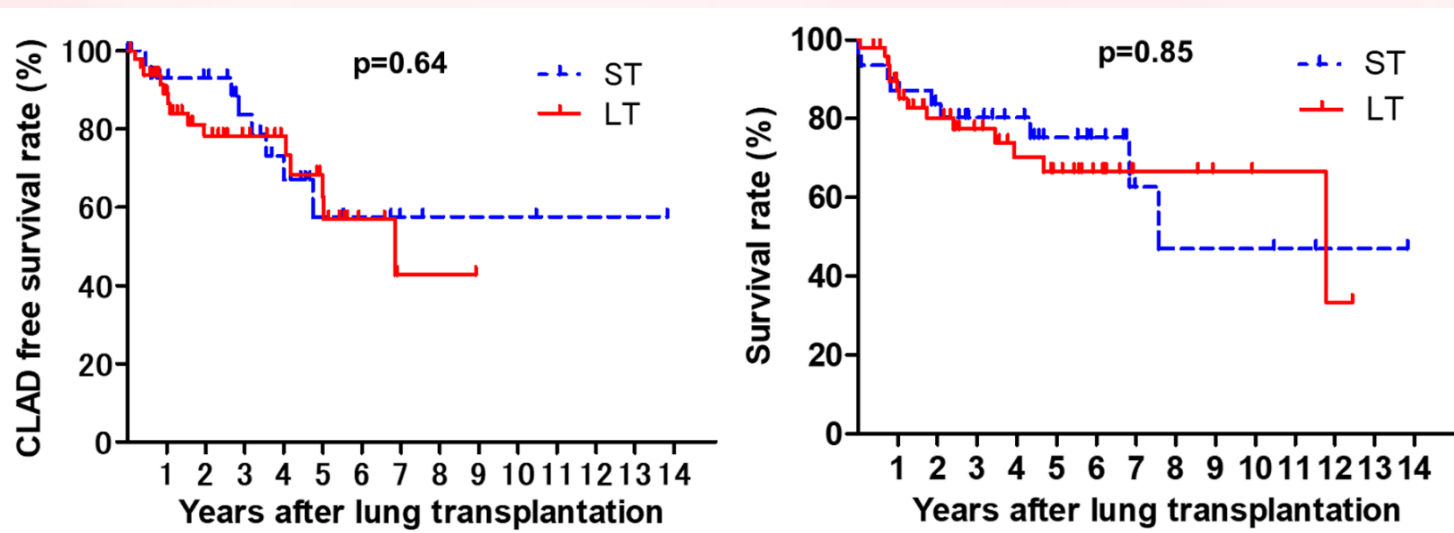


Table 3. Postoperative results

Variables	Short-term group (n=31)	Long-term group (n=50)	p-Value
ECMO	3 (9.7%)	2 (4.0%)	0.37
Acute rejection episodes	0.55±0.80	0.36±0.66	0.26
AMR	3 (9.7%)	2 (4.0%)	0.37
Pneumonia≤30 days	9 (29.0%)	21 (42.0%)	0.34
Bronchial complication per anastomosis	3/53 (5.7%)	10/88 (11.4%)	0.37
30-day mortality	1 (3.2%)	1 (2.0%)	1.00

- The CLAD-free survival rate and the overall survival rate in the LT group were comparable to those in the ST group.



Discussion

- Our results suggest that inclusion of donors ventilated for more than 5 days could contribute to expansion of the donor pool for LTx.
- Also, our results indicate that a prolonged duration of mechanical ventilation is only relevant information for assessing the donor lungs, and not a contraindication per se to donation, and that the utilization of the donor lungs should be based on a comprehensive assessment of the donor lung condition, e.g., by evaluation of the donor lung score.
- In this study, the prolonged ventilation in the donors could be attributed to the organ donation system and social background in Japan.

Conclusions

LTx from donors who had received mechanical ventilation for more than 5 days provided favorable results, and could be a feasible strategy to alleviate donor organ shortage.

Relevant Financial Relationship Disclosure Statement

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