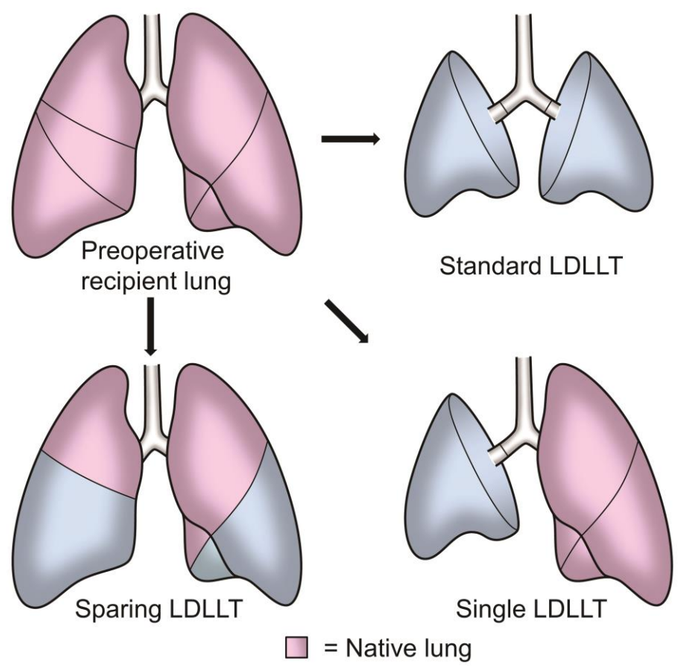
Native Lung Complications after Living-donor Lobar Lung Transplantation

Katsutaka Mineura, MD,[a] Toyofumi F. Chen-Yoshikawa, MD, PhD,[a,b] Satona Tanaka, MD, PhD,[a] Yoshito Yamada, MD, PhD,[a] Yojiro Yutaka, MD, PhD,[a] Daisuke Nakajima, MD, PhD,[a] Akihiro Ohsumi, MD, PhD,[a] Masatsugu Hamaji, MD, PhD,[a] Toshi Menju, MD, PhD,[a] and Hiroshi Date, MD, PhD[a]

[a]Department of Thoracic Surgery, Kyoto University Graduate School of Medicine, Kyoto, Japan; and
[b]Department of Thoracic Surgery, Nagoya University Graduate School of Medicine, Nagoya, Japan.

BACKGROUND

Living-donor lobar lung transplantation (LDLLT) is essential for critically ill patients in situations of severe donor shortage. To overcome difficulty in size matching, we proposed native lung-sparing procedures, including single-lobe transplantation for recipients with an oversized graft and native upper lobe-sparing transplantation for those with undersized grafts with favorable outcomes [1-4].



OBJECTIVE

As in single cadaveric lung transplantation (CLT), spared native lungs may become sources of complications after native lung-sparing LDLLT; however, there is a paucity of information regarding native lung complications (NLCs) after LDLLT.
This study aimed to assess the clinical features, management, and long-term outcomes of NLCs after LDLLT and investigate the effect of NLCs on survival among LDLLT recipients and the difference in NLCs between LDLLT and CLT.

METHODS

Our prospectively maintained database and clinical records were reviewed for the period February 2005 – March 2019 to identify and compare NLCs among recipients who underwent native lung-sparing LDLLT (n=21) with those among recipients who underwent single CLT (n=61).

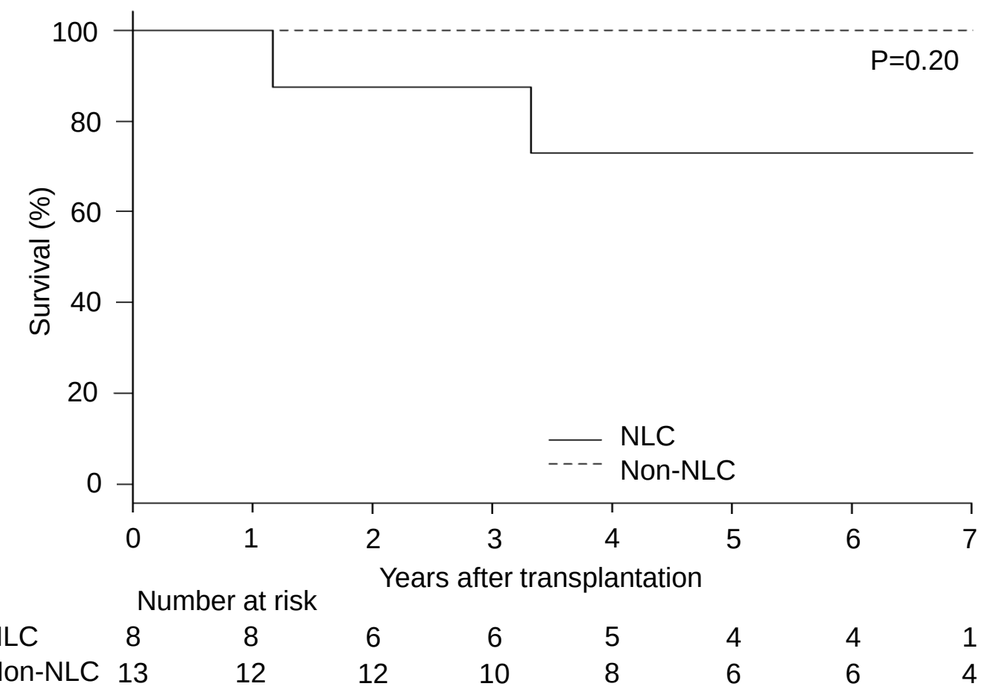
RESULTS

Recipients with NLCs after Native Lung-sparing LDLLT

Case	Age[a] /Sex	Indication for LT	Procedure of LDLLT	NLC	Onset[b] (days)	Treatment	Follow-up[c] (years)	Survival (cause of death)
1	41/F	Pulmonary Cx after HSCT	Right single	**Infection**	1385	Pneumonectomy	11.3	Alive
2	61/M	Interstitial lung disease	Right upper lobe-sparing	**Infection**	166	Medical treatment with hospitalization	3.3	Dead (CLAD)
				Pneumothorax	665	Chest drainage		
3	12/M	Pulmonary Cx after HSCT	Right single	**Pneumothorax**	1655	Chest drainage	7.0	Alive
4	56/M	Interstitial lung disease	Bilateral upper lobe-sparing	**Pneumothorax (right)**	393	Chest drainage	6.5	Alive
				Pneumothorax (left)	782	Follow-up with hospitalization		
5	21/M	Pulmonary hypertension	Bilateral upper lobe-sparing	**Organizing pneumonia**	1314	Medical treatment with hospitalization	6.2	Alive
6	59/M	Interstitial lung disease	Right upper lobe-sparing	**Pneumothorax**	1776	Follow-up without hospitalization	5.1	Alive
7	63/M	Interstitial lung disease	Right upper lobe-sparing	**Pulmonary embolism**	240	Medical treatment with hospitalization	1.2	Dead (CLAD)
				Organizing pneumonia	324	Medical treatment with hospitalization		
8	6/M	Pulmonary hypertension	Right single	**PTLD**	174	Lobectomy	2.0	Alive

[a]Age at lung transplantation [b]Onset of native lung complication after lung transplantation [c]Follow-up period after lung transplantation

Actuarial Survival after Transplantation of Native Lung-sparing LDLLT Recipients with NLCs and Those without NLCs



Comparison of NLCs after Native Lung-sparing LDLLT and Those after Single CLT

	NLCs after LDLLT (N=11)	NLCs after CLT (N=32)	P value
Details			
Pneumothorax	5(45%)	16(50%)	1
Infection	2(18%)	10(31%)	0.70
Required treatment			
Hospitalization	10(91%)	24(75%)	0.41
Surgery	2(18%)	13(41%)	0.28
Fatal	0(0.0%)	2(6.3%)	1
Onset[a] (days)	**665(166-1776)**	181.5(8-1795)	**0.014**

[a]Onset of native lung complication after lung transplantation

NLC, native lung complication; LDLLT, living-donor lobar lung transplantation; CLT, cadaveric lung transplantation; LT, lung transplantation; F, female; M, male; Cx, complication; HSCT, hematopoietic stem cell transplantation; CLAD, chronic lung allograft disfunction; PTLD, post-transplant lymphoproliferative disorder.

CONCLUSIONS

- NLCs after native lung-sparing LDLLT had favorable outcomes.
- Therefore, native lung-sparing LDLLT is a useful treatment option for severely ill patients who cannot wait for CLT.
- However, it is important to consider that NLCs may occur later in LDLLT than in CLT.

REFERENCES

1. Date et al.: Outcome of living-donor lobar lung transplantation using a single donor. J Thorac Cardiovasc Surg 2012.
2. Aoyama et al.: Sparing Native Upper Lobes in Living-Donor Lobar Lung Transplantation: Five Cases From a Single Center. Am J Transplant 2015.
3. Date et al.: Outcomes of various transplant procedures (single, sparing, inverted) in living-donor lobar lung transplantation. J Thorac Cardiovasc Surg 2017.
4. Takahagi et al.: Native upper lobe-sparing living-donor lobar lung transplantation maximizes respiratory function of the donor graft. J Heart Lung Transplant 2019.

None of the authors has a financial relationship with a commercial entity that has an interest in the subject of the presented manuscript or other conflicts of interest to disclose.