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THOR

Commentary: Small can be beautiful, in the right hands

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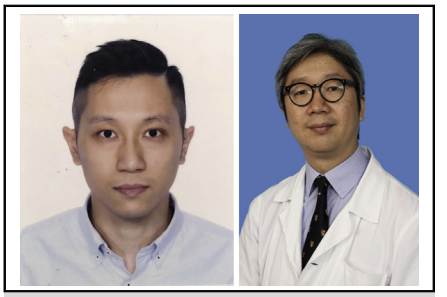

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CENTRAL MESSAGE

Cadaveric lobar lung transplant is often performed for very sick patients, which is reflected in the early outcomes. Mid- and long-term results, however, are comparable with standard lung transplant.

Matching appropriately sized donor lungs for patients of small stature who are listed for lung transplant (LTx) is challenging, which results in longer waitlist time and increased morbidity and mortality. This may be addressed by surgical down-sizing of the donor lung. Nonanatomical wedge resection, usually to the right middle lobe or lingula, can achieve a 10% to 15% down-sizing.[1] When size discrepancy is significant, cadaveric lobar lung transplantation (LLTx) may be considered. First reported by Bisson in 1994, cadaveric LLTx remains infrequently performed, and published reports are limited.[2]

In this issue of the *Journal*, the Toronto group reported one of the largest published series of cadaveric LLTx—between 2000 and 2017, they performed 75 LLTx procdures.[3] Pulmonary fibrosis was the most common diagnosis, and similar to previous reports, recipients of LLTx were more likely to be rapidly deteriorating and required bridging by mechanical ventilation or extracorporeal life support.[4-7]

When compared with standard LTx, their recipients of LLTx were more likely to have postoperative primary graft dysfunction grade 3 or extracorporeal membrane oxygenation and longer intensive care unit and hospital length of stay. Both 30- and 90-day mortality was greater in the LLTx group. In a subanalysis, in the modern era, the LLTx group 90-day mortality was no different from the standard LTx. Survival at 1, 3, and 5 years, and the development of chronic lung allograft dysfunction, was no different between LLTx and standard LTx.

Donor–recipient size matching methods include chest radiograph parameters, the ratio of donor and recipient heights, and the ratio of the predicted total lung capacity of the donor and the recipient (pTLC ratio).[8] In Toronto, nonanatomical downsizing is performed when the donor pTLC is up to 1 L more than the recipient pTLC, whereas when the donor pTLC exceeds by 1.0 L, they consider LLTx.

Intraoperative circulatory support was mandatory, to reduce reperfusion injury, because of the smaller vascular bed in LLTx. The Toronto group routinely performed a back-table lobectomy. This can be done by a separate surgeon in parallel with the recipient operation, thus reducing the ischemic time, and the view of the hilum is unobstructed. Technically, the dissection is more difficult because the blood vessels are empty. Alternatively, lobectomy can be performed after lung implantation. However, this means operating inside a small chest cavity, and following reperfusion, the lung parenchyma may be more edematous and prone to tearing.

A pooled analysis of 8 studies of LLTx showed an increased relative risk of 1-year mortality of 1.85 compared with standard LTx.[8] The Toronto results showed the gap between LLTx and standard LTx has decreased, despite a sicker cohort, most probably because of intraoperative extracorporeal membrane oxygenation, implementing ex vivo lung perfusion assessment, and growing experience. In the Toronto series, rapidly deteriorating status was not an

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independent risk factor for mortality. Interestingly, in a series from Leuven, when LLTx was performed on patients with stable cystic fibrosis, no difference in mortality was found between LLTx and standard LTx groups.[9]

Overall, the Toronto experience reaffirms that LLTx is an important option for patients of small stature who would otherwise languish on the waiting list, and recognizing the challenges involved, this should be performed by experienced centers.

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Commentary: Lobar lung transplantation: Trick or treat-(ment)

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CENTRAL MESSAGE

Deceased LLTX is a valuable tool to expand the possibilities of transplantation and to overcome the scarcity of small donor lungs.

In the paper "Deceased-Donor Lobar Lung Transplant: A Successful Strategy for Small-Sized Recipients," Campo-Cañaveral de la Cruz and colleagues[1] report about their institutional experience with lobar lung transplantation (LLTX) and suggest it as a valuable option to overcome especially the scarcity of small donor organs. In fact, although LLTX has been described already for many years,[2] it has never achieved a wide acceptance by the majority of transplant centers. For this reason, the authors of the current article deserve credit for bringing this important topic to our attention.

LLTX is a clearly much more challenging technique, compared with standard "whole" lung transplantation. To safely apply this technique, it requires both considerable

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