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Commentary: How to avoid vascular kinking in implanting a contralateral lung graft

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Implantation of a contralateral lung graft is a rare surgery but is not new. The French group reported a pulmonary bi-partitioning technique for 7 patients in 1997.¹ In this procedure, the donor's left lung was divided into a left upper lobe graft and a left lower lobe graft. The left upper lobe graft was inverted and implanted into the recipient's right chest cavity, and then the left lower lobe graft was implanted into the left chest cavity. In 2001, the same group reported successful right single lung transplantation using a donor left lung graft for a patient with a history of previous left pneumonectomy.²

Our group reported successful single and bilateral living-donor lobar lung transplantation using a right-to-left inversion technique when donor grafts were too small.³ We simulated this procedure using 3-dimensional models produced by a 3-dimensional printer. In 15 patients receiving right-to-left inverted living-donor lobar lung transplantation, no complications occurred in the bronchial and vascular anastomoses. No operative mortality occurred, and all the patients were discharged to home. The 3-year survival was 92.3%.⁴

Implanting a contralateral lung graft is technically challenging. When a contralateral donor lung graft is placed in the recipient chest cavity after a 180° rotation around its superior-inferior axis from its anatomic position, the anatomic posterior aspect of the donor lung becomes anterior in the recipient's chest. As a result, the donor's

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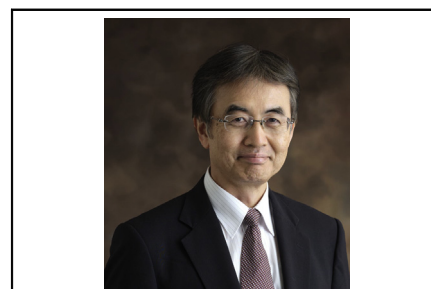
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CENTRAL MESSAGE

Avoiding vascular kinking is most important in implanting a contralateral lung graft, because the pulmonary arteries of the donor and the recipient are on opposite sides of the bronchus.

pulmonary artery is posterior to the donor's bronchus and the recipient's artery is anterior to the recipient's bronchus. Therefore, how to avoid vascular kinking is a critical issue in performing contralateral donor lung implantation.

In this issue of the *Journal*, Chida and colleagues⁵ report a precise technique of implanting the donor's right lung graft into the recipient's left chest cavity. The sequence of the anastomosis that they describe is unique, in that the pulmonary artery anastomosis was performed first. Stay sutures were placed on both the recipient and donor bronchi and then pulled to create a space for pulmonary artery anastomosis behind the bronchi. The recipient pulmonary artery was left a bit longer and was incised in an oblique fashion. The end-to-end anastomosis was performed without difficulty, and then the bronchial anastomosis was performed, followed by the left atrial anastomosis. Postoperative 3-dimensional computed tomography angiography showed good patency and no kinking of the pulmonary artery and vein.

Chida and colleagues are to be congratulated for developing this new surgical technique. An advantage of the pulmonary artery–first technique that they describe is the ease of pulmonary artery anastomosis. A potential disadvantage is the possibility of vascular kinking after the lung is inflated. To avoid this kinking, the pulmonary artery is trimmed to an appropriate length by estimating the position after reventilation.

Considering that the bronchus is a rigid structure that mainly determines the position of the implanted lung graft,

we prefer to anastomose the bronchus first. The pulmonary arteries are left long both in the recipient and the donor so that they can be trimmed to the appropriate lengths once the graft is fixed in its position.

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