

See Article page 388.

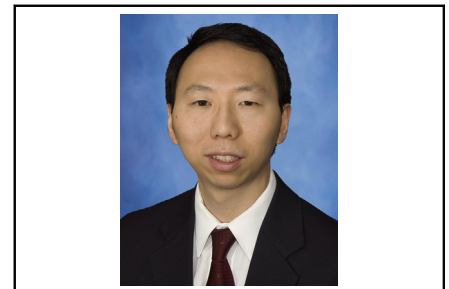


## Commentary: The matchmaker: Novel surgical procedures for graft size mismatch in living-donor lobar lung transplantation

Jules Lin, MD

In this brief research report, Nakajima and colleagues<sup>1</sup> demonstrate the successful use of novel living-donor lobar techniques, including native upper lobe-sparing and right-to-left inverted transplant for undersized grafts and single-lobe transplants for oversized grafts. The right-to-left lower lobe inverted technique is particularly novel, providing a graft that is 25% larger. However, the inverted technique is more complicated than the standard lobar technique, with the risk of pulmonary artery torsion and bronchopleural fistula with a stapled recipient left lower lobe bronchial stump. The authors provide important tips, including the use of a pericardial fat flap to buttress the bronchial stump, functional size matching using forced vital capacity, and 3D-CT volumetry for anatomical size matching.<sup>2</sup>

Despite the complexity of these lobar techniques, ischemic times were similar in the inverted and standard lobar groups. Although the duration of mechanical ventilation was relatively long at  $17 \pm 22$  days,  $13 \pm 10$  days, and  $25 \pm 20$  days for the standard, sparing/inverted, and single lobar groups with tracheostomy rates of 57.4%, 72.7%, and 54.5%, long-term pulmonary function, exercise capacity, and survival were similar to the standard living lobar group.<sup>3</sup> The 5-year survival in the current study was excellent, with 75.4% survival in the sparing/inverted group and 90.9% after single lobe transplantation. Bowdish and colleagues<sup>4</sup> also found comparable outcomes after living-donor and cadaveric lung transplants. Bronchial



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### CENTRAL MESSAGE

The authors demonstrate the art of matchmaking using living-donor lobar techniques, including native upper lobe-sparing, right-to-left inverted, and single lobe transplant to deal with size mismatch.

complications in the current study occurred in 4.5% in the sparing/inverted group, although the severity of these complications was unclear. Sugimoto and colleagues<sup>5</sup> found that airway complications after living-donor lobar transplants required significantly earlier treatment and had a greater impact on survival than after cadaveric transplant.

Since the first reports of successful living lobar transplantation by Starnes and colleagues in 1992,<sup>6</sup> the number of living donor transplants in the United States has substantially decreased, with none performed since 2013.<sup>7</sup> However, in Japan, where cultural beliefs have limited cadaveric donation even after laws were revised so families of brain-dead donors could make decisions on organ donation, the use of living lobar donors has grown. While most cadaveric donor size mismatches can be addressed with wedge resection, living lobar lung transplant can provide important technical teaching points when a cadaveric lobar lung transplant is needed due to extreme size mismatch, especially in smaller adults or with severe mediastinal shift.<sup>8</sup>

The authors should be congratulated on their excellent outcomes while moving techniques in lobar lung transplantation forward. However, there are important differences in the study population, with shorter ischemic times, the younger age of the recipients, and the primary lung diagnosis, making comparisons to cadaveric studies more difficult. Future studies should compare outcomes for patients undergoing right-to-left inverted and native upper lobe-sparing

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transplants for undersized grafts to standard living lobar donors with a predicted forced vital capacity <60%.

The authors continue to refine their techniques in living-donor lung transplants using novel native upper lobe-sparing, right-to-left inverted, and single lobar transplants to overcome issues with size mismatch successfully demonstrating the art of donor-recipient matchmaking.

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