

The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.



**REPLY: THERE IS NO
SUBSTITUTION FOR A
SURGEON'S EYES, BUT
SOMETIMES SHE**



MIGHT NEED GLASSES

To the Editor:

Success in lung transplantation involves a collaborative effort among surgeons, anesthesiologists, perfusionists, and operating room staff. The expertise and different perspectives of these specialties working together ultimately benefits patients. We appreciate the letter from Kumar and colleagues¹ discussing the influence of cardiac anesthesiologists and, in particular, the use of transesophageal echocardiography (TEE) in lung transplantation for the assessment of pulmonary artery (PA) anastomoses, determined to be a class IIb indication by the American Society of Echocardiography.^{1,2} Although we agree that having flow, pressure, and velocity measurements through the PA is helpful, velocity and pressure gradients are influenced by loading conditions, irregular rhythms, or tachycardia often present during the dynamic conditions that occur during lung transplantation in anesthetized patients. More crucial is to follow key surgical principles during PA anastomosis. First, the surgeon must keep the donor PA short to prevent kinking following closure of the patient's chest.³ Keeping the donor PA long makes the anastomosis easy, but upon closing the chest, the PA may become redundant and kink. We utilize a cooling jacket during implantation that not only keeps the donor lung cool, but also props the lung up toward the hilum, allowing for a shorter donor PA length. Another guide can be the distance between the first branch of the donor PA and the PA anastomosis because a long distance may indicate that the donor PA was kept too long. It is our belief that length is more important than diameter of the PA and it is important not to conflate kinking due to a long PA with size mismatch or stricturing during size correction. Second, to avoid twisting, a surgeon should identify the location of the first PA branch on the left and

the truncus branch on the right to properly align the donor to recipient PA. Third, to prevent narrowing the diameter of the anastomosis, care is needed when tying the PA suture. Maintaining these basic surgical principles should ensure the success of the PA anastomosis. When visually inspecting the PA anastomosis, a surgeon should be able to identify issues with narrowing, twisting, and kinking of the PA. The development of hemodynamic instability, significant pulmonary hypertension, unexplained hypoxia or acidosis, or diminished capnography tracing after lung transplantation may suggest PA stenosis, which is when TEE can be determinant.⁴ The PA luminal diameter is load independent, but instead of recommending a minimal cutoff, other authors have considered normal a lumen measuring at least 75% of the proximal PA, which accounts for patient size.^{5,6} Finally, the difference in gradient between the proximal and distal PA pressures to differentiate between PA anastomosis stenosis and increased pulmonary hypertension can be determined without TEE by the surgeon advancing a pulmonary catheter through the anastomosis.⁷ Therefore, although TEE can be used as a supplement to a surgeon's eyes when there is concern, it should not always be a requirement, especially because the left pulmonary anastomoses are often situated outside of the view of the TEE probe, in which case epicardial echocardiography can be more helpful.^{5,8,9}

Sahar A. Saddoughi, MD, PhD^a

Jacobo Moreno Garijo, MD, MSc, EDA^b

Jonathan C. Yeung, MD, PhD, FRCSC^a

^aToronto Lung Transplant Program

Toronto General Hospital

Toronto, Ontario, Canada

^bDepartment of Anesthesia and Pain Management

Toronto General Hospital

Toronto, Ontario, Canada

References

1. Kumar N, Flores AS, Hussain N, Ganapathi AM, Whitson BA, Essandoh MK, et al. Ensuring pulmonary artery patency in donor-recipient size mismatch: a collaborative challenge. *J Thorac Cardiovasc Surg Tech.* 2022;15:206-7.
2. Cheitlin MD, Armstrong WF, Aurigemma GP, Beller GA, Bierman FZ, Davis JL, et al. ACC/AHA/ASE 2003 guideline update for the clinical application of echocardiography: summary article. A report of the American College of Cardiology/American Heart Association task force on practice guidelines. *J Am Soc Echocardiogr.* 2003;16:1091-110.
3. Boasquevisque CHR, Yildirim E, Waddel TK, Keshavjee S. Surgical techniques: lung transplant and lung volume reduction. *Proc Am Thorac Soc.* 2009;6:66-78.
4. Tan Z, Roscoe A, Rubino A. Transesophageal echocardiography in heart and lung transplantation. *J Cardiothorac Vasc Anesth.* 2019;33:1548-58.
5. Michel-Cherqui M, Brusset A, Liu N, Raffin L, Schlumberger S, Ceddaha A, et al. Intraoperative transesophageal echocardiographic assessment of vascular anastomoses in lung transplantation. A report on 18 cases. *Chest.* 1997;111:1229-35.
6. Leibowitz DW, Smith CR, Michler RE, Ginsburg M, Schulman LL, McGregor CC, et al. Incidence of pulmonary vein complications after lung transplantation: a prospective transesophageal echocardiographic study. *J Am Coll Cardiol.* 1994;24:671-5.

Copyright © 2021 The Author(s). Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

7. Despotis GJ, Karanikolas M, Triantafillou AN, Pond CG, Kirvassilis GV, Patterson GA, et al. Pressure gradient across the pulmonary artery anastomosis during lung transplantation. *Ann Thorac Surg.* 1995;60:630-4.
8. Serra E, Feltracco P, Barbieri A, Forti A, Ori C. Transesophageal echocardiography during lung transplantation. *Transplant Proc.* 2007;39:1981-2.
9. Felten ML, Michel-Cherqui M, Sage E, Fischler M. Transesophageal and contact ultrasound echographic assessments of pulmonary vessels in bilateral lung transplantation. *Ann Thorac Surg.* 2012;93:1094-100.

<https://doi.org/10.1016/j.xjtc.2021.08.012>