

from achalasia, such patients can even be considered for partial fundoplication if they have reflux and likely have a different survival trajectory compared with the other categories. Such differences should be taken into account in evaluating this patient population.

On the same note, we need to acknowledge the selection bias that is introduced by the transplant selection process. The patients reported were well selected and do not represent the general patient with aperistalsis. This is evident from the interesting finding that most patients in this series did not have severe acid reflux.

Overall, these results are encouraging and add to our understanding of esophageal dysfunction in the context of pulmonary transplantation. However, these findings should not mean carte blanche in offering transplantation to all

aperistaltic patients because the nuances can significantly alter the outcomes.

References

1. Orens JB, Estenne M, Arcasoy S, Conte JV, Corris P, Egan JJ, et al; Pulmonary Scientific Council of the International Society for Heart and Lung Transplantation. International guidelines for the selection of lung transplant candidates: 2006 update—a consensus report from the pulmonary scientific council of the International Society for Heart and Lung Transplantation. *J Heart Lung Transplant.* 2006;25:745-55.
2. Fisichella PM, Jalilvand A. The role of impaired esophageal and gastric motility in end stage lung diseases and after lung transplantation. *J Surg Res.* 2014;186:201-6.
3. Miele CH, Schwab K, Saggari R, Duffy E, Elashoff D, Tseng CH, et al. Lung transplant outcomes in systemic sclerosis with significant esophageal dysfunction: a comprehensive single-center experience. *Ann Am Thorac Soc.* 2016;13:793-802.
4. Masuda T, Mittal Sk, Csucska M, Kovacs B, Walia R, Huang JL, et al. Esophageal aperistalsis and lung transplant: recovery of peristalsis after transplant is associated with improved long-term outcomes. *J Thorac Cardiovasc Surg.* 2020;160:1613-26.

THOR

See Article page 1613.



Commentary: The return of peristalsis after lung transplant in patients with an aperistaltic esophagus—is it possible?

Chi-Fu Jeffrey Yang, MD



Chi-Fu Jeffrey Yang, MD

Lung transplant candidates who have preoperative esophageal dysmotility are at an increased risk of having repetitive aspiration events that, after transplant, could lead to graft injury, bronchiolitis obliterans syndrome, and restrictive allograft syndrome.¹ However, the short- and long-term outcomes of patients with esophageal aperistalsis who undergo lung transplant are largely unknown. How often do these patients have return of peristalsis after transplant? Do they have worse survival compared with patients with normal peristalsis? Should lung transplant

CENTRAL MESSAGE

Carefully selected patients diagnosed with an aperistaltic esophagus before lung transplant can have improved esophageal motility and reasonable long-term survival after transplant.

From the Department of Cardiothoracic Surgery, Stanford University Medical Center, Stanford, Calif.

Disclosures: Author has nothing to disclose with regard to commercial support. Received for publication March 8, 2020; accepted for publication March 9, 2020; available ahead of print March 19, 2020.

Address for reprints: Chi-Fu Jeffrey Yang, MD, Falk Cardiovascular Research Center, 300 Pasteur Drive, Stanford, CA 94305 (E-mail: cjyang@post.harvard.edu).

J Thorac Cardiovasc Surg 2020;160:1630-1
0022-5223/\$36.00

Copyright © 2020 by The American Association for Thoracic Surgery
<https://doi.org/10.1016/j.jtcvs.2020.03.009>

candidates with esophageal aperistalsis undergo lung transplantation?

In this issue of the *Journal*, Masuda and colleagues² begin to answer these questions by reporting their experience at a single institution over 3 years (2013-2016). The authors compared the outcomes of 31 lung transplant recipients who had aperistalsis with those of 115 lung transplant

recipients with normal esophageal motility. All patients were evaluated pretransplant by high-resolution manometry. To control for confounding, the authors performed propensity score matching, resulting in 2 groups well matched for 13 baseline characteristics, including type of underlying lung disease, lung allocation score, type of lung transplant, mean pulmonary artery pressure, and graft ischemic time. In the aperistalsis group, after lung transplant, 65% (19/29) of patients had improved esophageal motility, and approximately half of these patients (10/19) had what was determined to be effective esophageal motility (defined as >60% effective contractile vigor). In the normal peristalsis group, after transplant, 86% continued to have effective esophageal motility, and 14% had marginal esophageal motility.

As expected, the aperistalsis group had significantly worse 1-, 3-, and 5-year post-lung transplant survival when compared with the normal peristalsis group. However, in patients who had recovery of peristalsis, the 1-, 3-, and 5-year post-transplant survival rates were 89.5%, 65.0%, and 48.8%, respectively, which were similar to the 1-, 3-, and 5-year post-transplant survival rates of the normal peristalsis group (90.3%, 73.4%, and 58.8%, respectively), whereas the nonimproved peristalsis group had significantly lower survival (80.0%, 36.0%, and 0%, respectively).

The authors should be congratulated for performing a well-done, impactful study that provides much needed data on the clinical course of lung transplant recipients who have preoperative aperistalsis. Although some high-volume centers offer transplant to lung transplant candidates with aperistalsis on a case-by-case basis, in general, aperistalsis has been considered a relative contraindication to transplant. Skepticism persists about aperistaltic patients having return of function after lung transplant given the likelihood of vagal nerve injury associated with the procedure. However, data on post-transplant esophageal motility are sparse, and this study demonstrates that improvements

in esophageal motility can occur in patients diagnosed preoperatively with aperistalsis. It is important to note that in this study, certain subgroups of patients with aperistalsis had particularly poor outcomes. For example, among the 5 patients with systemic sclerosis in the aperistalsis group, 4 had no improvement in esophageal motility, and presumably this subgroup had worse survival than the other patients with esophageal aperistalsis (although the authors did not formally evaluate this). The authors did note that the 1 patient who had improved esophageal motility after lung transplant is still alive after 5 years post-transplant.

In the future, it will be important to develop and validate accurate clinical prediction models to help surgeons determine which lung transplant candidates who have aperistalsis are most likely to have improvement of esophageal motility after transplant. To do so will most likely require the collaboration of multiple high-volume centers to generate the sample sizes and granularity of data required to develop these models. It would also be helpful if the United Network for Organ Sharing database could start collecting data on preoperative and postoperative esophageal manometry, pH monitoring, gastric emptying, type of postoperative enteral access used, and type of antireflux procedure used post-transplant (eg, early fundoplication, Roux-en-y bypass). In the meantime, the data from this study suggest that aperistalsis should not be considered an absolute contraindication to transplant and that carefully selected lung transplant candidates who have aperistalsis diagnosed preoperatively can have improved esophageal motility after transplant and reasonable short-term and long-term outcomes.

References

1. Wood RK. Esophageal dysmotility, gastro-esophageal reflux disease, and lung transplantation: what is the evidence? *Curr Gastroenterol Rep*. 2015;17:48.
2. Masuda T, Mittal SK, Csucska M, Kovacs B, Walia R, Huang JL, et al. Esophageal aperistalsis and lung transplant: recovery of peristalsis after transplant is associated with improved long-term outcomes. *J Thorac Cardiovasc Surg*. 2020;160:1613-26.