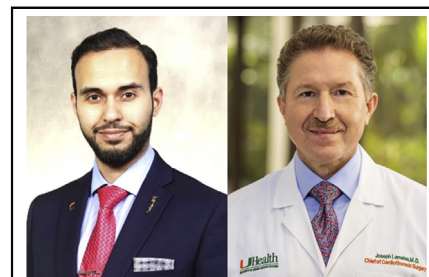


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Commentary: The mini-thoracotomy approach for descending aorta: Small, simple and safe!

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Since it was first performed by Dake and colleagues in a descending thoracic aortic aneurysm (DTA) repair,¹ thoracic endovascular aortic repair (TEVAR) has transformed aortic surgery and interventions. For almost 3 decades now, TEVAR has been increasingly used for traumatic aortic and aneurysmal lesions of the aortic arch and the descending aorta owing to trends toward lower mortality and/or morbidity.²⁻⁴ Despite a lack of relevant randomized clinical trials that provide high-quality evidence of the superiority of this approach to open repairs, the increased utilization of TEVAR has offered new hope for patients at high risk for traditional open aortic surgery. Still, to provide optimal results, alternative techniques should be explored. In this issue of *JTCVS Techniques*, Rhee and Kim⁵ report an impressive series of minimally invasive DTA repair via a lateral thoracotomy incision through the fifth intercostal space. Their outstanding results are thought-provoking in the current era of large-scale use of endovascular procedures.

In their case series of 9 patients, the authors aimed to perform a durable repair with only minimal surgical trauma. They performed 8- to 10-cm incision, sparing the latissimus dorsi and serratus anterior muscles, which allowed direct mid-DTA access for synthetic graft replacement.

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CENTRAL MESSAGE

The mini-descending aorta technique is presented as a safe minimally invasive approach for simple descending aorta repair, but stronger evidence is required before it can replace endovascular procedures.

Because the intercostal arteries are derived from the descending aorta, spinal cord perfusion can be compromised during endovascular DTA repair if the graft covers these arterial branches. Segmental artery reimplantation in thoracoabdominal aortic aneurysms may reduce the risk of spinal cord ischemia injury,⁶ but it is unclear whether this can be of benefit during simple DTA repair. Although neither intercostal reimplantation nor cerebrospinal fluid drainage was performed in this cohort of low-risk patients, it may be beneficial to explore the long-term results of this mini-descending approach compared with TEVAR.

Notably, patient selection was highly dependent on the length of the aneurysm. When implementing this technique, lesions extending >15 cm, and thus patients with connective tissue disease, were not considered to be candidates. A modification of this approach with transection of a rib may improve proximal exposure for extensive aneurysms⁷ or in conjunction with TEVAR in a single-stage procedure.⁴ These approaches may potentially have better outcomes than traditional open or two-stage TEVAR procedures, paving the way for ideal DTA management.

Of note, the authors used this approach with thoroscopic assistance. Although this produced outstanding outcomes, the scope might not be necessary to achieve these results. Lamelas and colleagues' experience with a minimally invasive approach in aortic valve replacement, double- or triple-valve procedures, and ascending aortic surgery have produced excellent outcomes in similar circumstances and

without a scope.⁸⁻¹⁰ Thus, further implementation of this approach without thoracoscopic assistance could decrease the learning curve challenge for adopting surgeons.

Finally, although this approach demonstrated promising results in highly selected patients, it will require careful long-term evaluation. Future studies demonstrating cost-effectiveness and long-term outcomes in representative patient populations will ultimately prove this new technique's advantages over traditional open and endovascular repair.

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References

1. Dake MD, Miller DC, Semba CP, Mitchell RS, Walker PJ, Liddell RP. Transluminal placement of endovascular stent-grafts for the treatment of descending thoracic aortic aneurysms. *N Engl J Med*. 1994;331:1729-34.
2. Lee HC, Joo HC, Lee SH, Lee S, Chang BC, Yoo KJ, et al. Endovascular repair versus open repair for isolated descending thoracic aortic aneurysm. *Yonsei Med J*. 2015;56:904-12.
3. Jones DW, Goodney PP, Nolan BW, Brooke BS, Fillinger MF, Powell RJ, et al. National trends in utilization, mortality, and survival after repair of type B aortic dissection in the Medicare population. *J Vasc Surg*. 2014;60:11-9.e1.
4. Corvera JS, Fehrenbacher JW. Total arch and descending thoracic aortic replacement by left thoracotomy. *Ann Thorac Surg*. 2012;93:1510-5; discussion 1515-6.
5. Rhee Y, Kim JB. Miniaccess open repair of descending thoracic aorta. *J Thorac Cardiovasc Surg Tech*. 2021;8:27-30.
6. Safi HJ, Miller CC III, Carr C, Iliopoulos DC, Dorsay DA, Baldwin JC. Importance of intercostal artery reattachment during thoracoabdominal aortic aneurysm repair. *J Vasc Surg*. 1998;27:58-66; discussion 66-8.
7. Chiesa R, Tshomba Y, Civilini E, Marone EM, Bertoglio L, Baccellieri D, et al. Open repair of descending thoracic aneurysms. *HSR Proc Intensive Care Cardiovasc Anesth*. 2010;2:177-90.
8. Lamelas J, Chen PC, Loor G, LaPietra A. Successful use of sternal-sparing minimally invasive surgery for proximal ascending aortic pathology. *Ann Thorac Surg*. 2018;106:742-8.
9. Elmahdy HM, Nascimento FO, Santana O, Lamelas J. Outcomes of minimally invasive triple valve surgery performed via a right anterior thoracotomy approach. *J Heart Valve Dis*. 2013;22:735-9.
10. Lamelas J. Minimally invasive concomitant aortic and mitral valve surgery: the "Miami Method." *Ann Cardiothorac Surg*. 2015;4:33-7.