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Commentary: Preparing for the worst, expecting the worst can make it better

T. Brett Reece, MD, and Muhammad Aftab, MD

Surgeons always have to be thinking a step ahead. Sometimes that next step is the progression of an operation, but other times the next step may be an operation to address further aortic degeneration. In this issue of the *Journal*, our colleagues from the Texas Heart Institute present an impressive series of patients who underwent a reverse elephant trunk procedure for descending and thoracoabdominal repairs.¹ Their cohort comprises 94 patients considered to have more urgent indications distal but either less aggressive arch aneurysms or other markers suggesting that the proximal aorta would degenerate. The reverse elephant trunk can be pulled proximally under circulatory arrest to move the suture line proximally, avoiding the need to sew to the previous suture line or native tissue. Outcomes were impressive, with both the primary descending aortic procedures and the subsequent proximal aortic repairs. The authors believe this to be a good approach to facilitate proximal repair.

I applaud the forward-thinking approach that the reverse elephant trunk represents. Before the introduction of frozen elephant trunk, this approach allowed a more secure and reachable graft to graft anastomosis for the arch to previous repair connection. The depth of the anastomosis can be both intimidating and fraught with potential complications. This approach also could avoid potential recurrent laryngeal nerve manipulation, reducing subsequent swallowing issues.

Ideas like this have led to the zone 2 approaches for arch replacement using frozen elephant trunk. By moving the anastomosis anteriorly, even simple aortic surgeons like

CENTRAL MESSAGE

Patients with aortopathy at any level are at significant risk of further degeneration; therefore, the initial operation should consider facilitation of subsequent repairs.

myself can make extensive arch replacement more facile. Owing to the systemic vasculopathy present in many of these patients, all approaches must include planning for the next step. Zone 2 arch replacements need to leave a landing zone for a thoracic endovascular aortic repair for extension. The Penn group has used this zone 2 approach with subsequent arch completion for single-branch thoracic endovascular aortic repair.² This is feasible only with the addition of an ample landing zone for the stent distal to the carotid revascularization. Open bi-iliac repairs are another good example. Traditionally, the graft is supposed to have a short body with longer limbs. Unfortunately, in many patients, the short body did not provide an adequate landing zone for branched or physician-modified stents, ruling out the endovascular approach. Traditional approaches and teaching might not make that next step feasible, so the approach will need to evolve with technology.

Essentially, aortic surgeons need to pay particular attention to the next step for patients. By understanding the potential for further degeneration and the treatments available for that particular anatomy, the surgeon can address both the issues at hand and provide a platform for the future, as this study demonstrates. Being prepared for future problems can transform them into smaller problems than they would have been otherwise.

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Commentary: Reverse elephant trunk procedure—staged by intention

Roland Assi, MD, MMS, and Arnar Geirsson, MD

In this issue of the *Journal*, Coselli and colleagues¹ update their 23-year experience with the staged reversed elephant trunk (RET) technique for complex thoracic aortic disease. Stage 1 consisted of thoracoabdominal aortic replacement (in general, extent I or II), leaving some invaginated length of the proximal graft to facilitate stage 2 proximal thoracic aortic replacement. This staged approach was offered to patients who needed their symptomatic distal thoracic aorta disease addressed before their proximal aortic disease and patients who were thought to be at risk for proximal operation in the future.

The reported surgical outcomes (morbidity and mortality) are good, supporting the concept of the RET technique as a viable option for the management of complex thoracic aortic disease. However, the high attrition rate after stage 1 operation is worth noting. For all patients who were considered for the staged approach, 10% did not survive stage 1, 38% died before making it to stage 2, 20% were still alive at follow-up without ever undergoing stage 2, and 3% were lost to follow-up. Of all patients who were intended to have the staged operation, only 29% completed stage 2. In fact, patients were more likely to die after stage 1 operation than to undergo stage 2.

Roland Assi, MD, MMS, and Arnar Geirsson, MD

CENTRAL MESSAGE

Reverse elephant trunk operation is a challenging but appropriate procedure for complex aortic pathology in selective cases with acceptable outcomes performed at a high-volume aortic center.

It is well known that thoracic aortic disease is one of the most challenging conditions that both patients and cardiovascular surgeons face. Recovery from a thoracoabdominal aortic operation is long and rarely without complications. We advocate for the consideration of the use of endovascular techniques whenever technically sound to decrease the extent and burden of the open operations. Even for patients who are deemed not suitable for endovascular repair, a staged hybrid approach is often possible with decreased morbidity compared with the open approach. In our opinion, the importance of enrolling all patients with thoracic aortic disease into an aortic surveillance clinic cannot be overemphasized. This is particularly important for high-volume centers that receive patients from all around the country and the world. The aortic surveillance clinic can help guide patients through their recovery process, organize and schedule their care and surveillance imaging, prepare for staged operations, and maintain a comprehensive research database.

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