The future is now: An endovascular option for type A aortic dissection

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The broad use of endovascular technology to treat descending thoracic aortic pathology has led to interest in applying these technologies to the ascending aorta, with particular emphasis on ascending type A aortic dissection (ATAD). There are several remaining technical challenges that warrant consideration. These include the close proximity between the aortic root, ascending aorta, and aortic arch; the intricate spatial relationships between vital structures of the aortic root; and available device dimensions are currently not designed for the ascending aorta. Published studies on endovascular approaches to the ascending aorta have been limited by relatively small sample size and heterogeneous aortic pathologies.¹⁻³

In this study, Nienaber and colleagues⁴ report a multi-institutional, international experience with thoracic endovascular aortic repair (TEVAR) for ATAD. During a 7-year span, they treated 12 patients with ascending TEVAR for ATAD, using a variety of stent graft devices. Six patients had an acute presentation, and 6 patients had a subacute time course before intervention. There was a single operative mortality due to wire-related left ventricular perforation. Otherwise, they achieved procedural success with entry tear exclusion in all remaining cases, and no type I endoleaks were seen during follow-up. Importantly, only 1 minor neurologic event was observed, and there was not a single incidence of stroke. These are excellent results in a patient population with significant comorbid burden of disease, and the study authors should be congratulated.

There are several clinical features of the patient population that are noteworthy. This was an elderly patient cohort, with average age greater than 80 years. Furthermore, all patients had either significant chronic lung disease, coronary disease, or renal dysfunction, and all were symptomatic at presentation. No patient, however, had evidence of aortic insufficiency or distal malperfusion. Most of the patients had a DeBakey type II dissection,

Illustration of transapical deployment of an endograft for acute type A dissection

Central Message

Endovascular technology will be applicable for treatment of acute type A aortic dissection in the future.

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which likely explains the fact that there were no distal malperfusion events. Further work is needed to identify the suitability of this strategy in patients who present with severe aortic regurgitation or neurologic sequelae from malperfusion.

This study demonstrates the feasibility of applying TEVAR technology to ascending aortic dissection (Figure 1). The authors also highlight that there is currently an unmet need for a suitable treatment strategy in a large number of patients with ATAD. Approximately 15% of patients with ATAD are deemed too high risk for conventional open surgical repair, and medical management of these patients has dismal outcomes with greater than 60% in-hospital mortality.⁵ This population of patients may stand to benefit significantly from TEVAR technology. Furthermore, in a recent report by the International Registry of Acute Aortic Dissection, surgical mortality remains at approximately 20%.⁵ Although these results have improved over the last 2 decades, we must constantly and critically examine our results and strive to improve outcomes, particularly in patients who present with unstable hemodynamics, contained rupture, or malperfusion. Additional studies with larger sample sizes are needed to identify which patients most stand to benefit from the TEVAR approach.

Technological advancements in cardiothoracic surgery require both new design technology as well as enhancements in existing technology. There has been successful

FIGURE 1. Illustration of transapical deployment of an endograft for acute type A dissection.

use of a Zenith device specifically designed for the ascending aorta, but more work needs to be done.⁶ It is

imperative that the cardiothoracic surgical community embraces innovation and works jointly with the endovascular technology industry to manufacture disease-specific devices intended for use in the ascending aorta. It is equally important to adopt a multidisciplinary effort, where the concept of an aortic team mirrors the heart team approach currently utilized so successfully in many institutions in the management of structural heart disease. TEVAR should be viewed as a complementary treatment platform to open repair in selected high-risk patients, and not necessarily as a complete replacement to open surgery. Nienaber and colleagues⁴ are to be commended for pushing the envelope forward in the management of this highly lethal disease process.

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