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EDITORIAL COMMENTARY

Burning bridges: Endovascular therapies for acute traumatic aortic transection

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See related article on pages 825-9.

Endovascular repair of acute aortic transection has often been viewed as a bridge to a more definitive open repair, particularly in younger patients. The less-invasive nature of endovascular aortic stent procedures has enabled acutely injured patients to undergo repair of their aorta while the remainder of their injuries are triaged. Concern regarding the durability of the aortic stent-grafts, along with potential for aortic dilation or growth in young patients, has prompted many surgeons to suggest a potential need for a definitive open surgical procedure after thoracic endovascular aortic repair (TEVAR) for traumatic rupture of the descending thoracic aorta, once patients have fully recovered from their injuries.¹

In this issue of the *Journal*, Canaud and colleagues² temper those concerns by providing 10-year follow-up data in patients who received TEVAR for acute traumatic transection. Convincing data show that TEVAR in the acute setting improves outcomes in traumatic aortic transection (TAT) patients.³ The current study is one of the first to evaluate the longer-term outcomes in this patient population. A total of 17 patients (4 women and 13 men, with an age range

of 18 to 78 years) were included in the study. The mean age of the patients was 45.8 ± 17 years, and all patients were alive at the 10-year mark. More importantly, no incidences of graft migration, collapse, reintervention, or secondary endoleak had occurred. The proximal seal zone showed mild dilation, of 3.3 ± 1.5 mm, over the study period. Interestingly, a significantly greater increase in proximal neck diameter was found in those patients age <30 years, compared with the older patients: $P = .0034$; 4 ± 1.2 mm versus 1.5 ± 1.7 mm. For the distal seal zone, a net 2.7 ± 1 mm increase occurred during the study period. This increase did not reach statistical significance for the patients age <30 years versus older patients ($P = .065$, 3.3 ± 1.6 mm vs 2.1 ± 1.6 mm).

This study helps answer several important questions surrounding the long-term management of TAT patients. Much of the long-term success in this study is predicated on excellent technical results at the time of the TEVAR procedure. As the authors appropriately note, minimal aortic stent oversizing (a maximum of 10%) helps prevent graft infolding. Furthermore, appropriately dealing with the highly angulated aortic arch by deploying the aortic stent-graft at a suitable anatomic landing zone helps achieve seal and conformability of the aortic stent-graft. Lack of graft apposition on the underside of the aortic arch is an undesirable result that affects the durability of repair. To put the results of this study in perspective, the current generation of aortic stent-grafts has improved conformability and deployment mechanics compared with the original devices used at the time of treatment, which makes the technical results achieved even more impressive.

A gradual increase in aortic diameter at the proximal and distal landing zones of the aortic stent is to be expected, consistent with the natural history of the aorta. Before this study, the question of whether this diameter increase would have a clinical impact in TEVAR patients treated for TAT

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was unanswered. Not surprisingly, the growth rate in patients age <30 years was greater, compared with patients age >30 years. However, no reinterventions or clinical sequelae were noted at 10-year follow-up. The stents are self-expanding, and being oversized 2-5 mm in diameter, can expand commensurately to the aorta. The follow-up question is: What happens when the aorta expands beyond the maximal size of the aortic stent? How long will this take? If it does, will an endoleak or graft migration occur? Will a reintervention be necessary? Future follow-up is needed on the patients in this and other studies to answer these questions.

With the understanding that aortic stent-grafts seem to be durable for 10 years, fewer screening computed tomography scans will be necessary. Switching from annual to biannual scans will decrease the total radiation dose in these patients. These new screening recommendations

need to be validated by other long-term studies, but will be well received by patients and screening physicians. In summary, TEVAR for TAT is no longer, by default, a bridge to an open procedure, and as this study shows, is a durable procedure. Longer-term studies will reveal the natural history of these treated patients in subsequent decades.

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