Fenestrated thoracic endovascular aortic repair for zone 2 lesions: Not just basic blocking and tackling

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In this issue of the *Journal*, Canaud and colleagues¹ present the results of their 3-year experience with using a homemade fenestrated stent graft to repair zone 2 aortic lesions. Canaud and colleagues¹ modified a commercially available stent graft on the basis of preoperative computed tomographic images to create a fenestration that would allow perfusion to the left subclavian artery (LSA) after deployment. Technical success was achieved in 100% of the study population. Not surprisingly, 12.5% of the patients required reintervention for endoleaks within a mean follow-up of 13 months. An additional patient with an endoleak is currently being observed. One patient had a stroke. Pretty good stuff, but is this a procedure ready for more widespread application?

Canaud and colleagues¹ are to be commended for enrolling a very limited number of patients in an institutional review board–approved protocol. Although one could argue that the results would have been cleaner with the exclusion of those without true zone 2 pathology (9 acute, complicated type B dissections), 100% technical success and no mortality is enviable. There are significant nuances about the planning and execution of this procedure, however, that go beyond basic thoracic endovascular aortic repair blocking and tackling.

Most importantly, Canaud and colleagues¹ themselves introduced significant modifications to a commercially available device. They withdrew the stent graft from its sheath and utilized cautery to create the fenestration at the predetermined location of the LSA. They then reinforced the fenestration by hand sewing a nitinol wire around the opening, in the hope that this would improve sealing the fenestration to the native aortic wall. The stent graft was then returned to the sheath for deployment and placed into the arch after an undisclosed number of repositionings, rotations, and angiograms to assure proper orientation of the fenestration. A number of patients required placement of a second device into the LSA to avoid a type III endoleak.

As Canaud and colleagues¹ appropriately highlighted in their discussion, there are some major technical questions that can only be answered with rigorous follow-up of this

Blocking and tackling.

Central Message

Homemade modifications of commercially available stent grafts are not ready for widespread adoption and should undergo rigorous comparison with commercially available devices in randomized trials.

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study cohort. What is the impact of the fenestration on the ring stability of the stent graft? What is the stability of the extra nitinol reinforcement? Will this modification increase the potential for branch stent collapse or breakage that could introduce significant late type III endoleaks? Will fabric durability be affected by the imperfect use of handheld cautery to create the fenestration? What negative events are brought on by the need for additional manipulation of a large device within a diseased aortic arch? Will any of our industry sponsors go along with this (we already know the answer), and what will our colleagues in the legal profession (on both sides of the field) think of this modified, homemade device?

Clearly, LSA coverage during thoracic endovascular aortic repair is less than desirable, and guidelines exist to help us decide when and how we might consider subclavian revascularization during endovascular aortic repair.² A carotid-to-subclavian bypass or translocation and “simple” thoracic endovascular aortic repair is not totally endovascular but it does get the job done in what is supposed to be a “high-risk” population (remember the Seahawks throwing the ball on the goal line two Super Bowls ago?). Premanufactured fenestrated stent grafts already exist, with a myriad of great vessel configurations that fit an overwhelming majority of arch anatomy.³ This homemade approach is clearly not ready for widespread adoption and should undergo rigorous comparison with these commercially available devices in a randomized trial.

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