Endovascular repair of the aortic arch: To see the future, we need to look beyond

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The frequency of reports citing the use of endovascular techniques to treat the aortic arch is increasing.¹ There are at present several endovascular treatment options for aortic arch lesions. Techniques of hybrid arch repair, chimney grafts, and branched stent grafts have all been described for patients with aortic arch disease. Currently, there is no Food and Drug Administration–approved off-the-shelf device for aortic arch repair, although significant progress is being made.

In this issue of the *Journal*, D'Onofrio and colleagues² report endovascular treatment of an aortic arch aneurysm with a modular single-branched stent graft in combination with left common carotid and left subclavian artery debranching. The outcomes at 6 months were excellent. Before we can see the future of aortic arch repair, however, we need to look beyond.

The initial benefit of endovascular repair has been to put pressure on open aortic arch surgeons to improve the outcomes of this challenging procedure. Those writing favorably about endovascular arch repair, commonly referring to a review by Moon and associates,³ appear to overstate the chief risks associated with open aortic arch surgery. The upper limit of the mortality range reported by Moon and associates³ (16.5%) does not reflect contemporary outcomes, because the data were collected between 1978 and 1997, and the upper limit of the reported stroke rate range (18.0%) stems from a subgroup of 30 patients undergoing isolated ascending aortic repairs. The data of Preventza and colleagues,⁴ who report an overall mortality of 12.5% and a stroke rate of 6.6%, may more accurately reflect contemporary outcomes.

The most appealing endovascular option is the use of custom-made branched devices (with 2 branches), allowing anatomic repair while precluding the need for left common carotid revascularization. The combined multicenter world experience, consisting of 38 branched arch devices, was first reported in 2014 by Haulon and coworkers.⁵ A 16% stroke rate and a 15.8% technical failure rate were reported. One important advantage of the single-branched stent graft is the simplicity of the procedure relative to multibranched stent grafts, which by decreasing the need for manipulation

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Central Message

Single-branched stent grafts offer a new option for endovascular aortic repair of the aortic arch.

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in the arch lowers the associated risk of microembolic stroke.

The main concern regarding this modern modular single branched stent-graft is its similarity to a previous modular single-branched device reported on by Chuter and colleagues⁶ 15 years ago. At that time, the modular endovascular approach was eventually abandoned. Close examination of the design of this new stent graft suggests that the overlap between the 2 modules cannot even satisfy the 5-cm recommendation made for the descending thoracic aorta. Considering the hostile environs of the ascending aorta such as its high pulsatility, mobility, and curvature, the durability and specifically the resistance to component separation of this modular approach will have to be proved.

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