Landing in zone 0: Is ascending thoracic endovascular aortic repair ready for takeoff?

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Thoracic endovascular aortic repair (TEVAR) has been rapidly embraced by the surgical community for the treatment of various acute and chronic distal aortic arch and descending thoracic aortic pathologies. If one pays attention to the details of a sufficient landing zone length and of respecting several anatomic details, results have been very encouraging.¹ As a consequence, the enthusiasm has continued when it comes to the possibility of exploring the treatment of even more proximally located disease processes involving the ascending aorta and finally the aortic root.

The first report in the literature of endovascular treatment of acute type A aortic dissection is now more than a decade old, but the progress in the meantime has been slow. This slowness becomes even more striking when one compares the stagnating development of ascending TEVAR with the rapid development of transcatheter aortic valve implantation technology.^{2,3}

To be able to understand why the current experience of ascending TEVAR is still limited to case series, one has to understand the fundamental differences between and therefore diametrically opposed requirements in technology when it comes to ascending TEVAR: the primary entry tear is nearly always in proximity to the sinotubular junction and therefore is close to the coronary offspring; there is no classical landing zone, because nearly each and every type A aortic dissection has a retrograde component at least into the noncoronary sinus (so a sealing zone is the maximum achievable); and undersizing instead of oversizing is needed because the dissecting process causes an acute ascending aortic diameter increase as great as 32%.⁴ Finally, the only component of the aortic root unaffected by dissection remains the aortic annulus. The marriage of transcatheter aortic valve implantation and TEVAR technology is thus the logical next step in the ability to provide a broader solution for a broader group of patients so that we are better able to address the unique requirements with which the underlying disease processes confront us.^{5,6}

This brings us to the value of the study of Roselli and colleagues⁷ in this issue of the *Journal*, which highlights that

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Central Message

Ascending TEVAR in its current form is not yet ready for broader takeoff, but results of landing at different zone 0 levels can be anticipated from underlying pathology with this new classification.

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success is dependent on the landing level in the proximal thoracic aorta. In other words, success depends on the underlying disease processes, which affect different proximal aortic segments to different extents, with acute type A aortic dissection being the most complex.

Summarizing, it is desirable and likely that this report will be another stimulus for the aortic community from both the physician and the industry sided to push toward better underlying disease-oriented solutions for a complex but ultimately soluble pathophysiologic challenge.

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