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Commentary: I saw the SINE

Asvin M. Ganapathi, MD, and John Bozinovski, MD

One of the greatest advancements in thoracic aortic surgery was the development of thoracic endovascular aortic repair (TEVAR) to treat aneurysms, ruptures, and dissections of the descending thoracic aorta. First performed in 1992,¹ TEVAR offered a quicker, minimally invasive alternative to an operation with a large incision and increased morbidity. The possibilities have been transformative from the treatment of aortic transections to the ability to offer repair to patients that are poor operative candidates. However, as with any technology, over time there have been unexpected sequela of TEVAR that have arisen, including aortic stiffening and subsequent de novo hypertension² as well as the more recently described stent graft–induced new entry (SINE), which was first described by Dong and colleagues³ in 2010.

In this issue of *JTCVS Techniques*, Wada and colleagues⁴ describe a case of SINE following treatment of a type I aortic dissection treated with an extended total arch replacement using a frozen elephant trunk (FET). Following a positive initial outcome, the patient developed a distal SINE that the authors explained as secondary to a remodeling mismatch, which required treatment with subsequent TEVAR delivered in a retrograde fashion. The report is important, as it highlights oversizing the stent graft relative to the true lumen as a risk factor for SINE (Hughes and colleagues)⁵ and offers the remodeling mismatch concept about the pathology of SINE. In addition, it describes the importance of the potential for “spring back” and the relationship with distal SINE when the stent graft is placed across the aortic arch,³ as occurs in FET.

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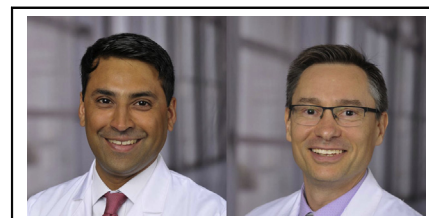
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Asvin M. Ganapathi, MD (left), and John Bozinovski, MD (right)

CENTRAL MESSAGE

Stent graft–induced new entry tear with frozen elephant trunk procedures is not well defined, and further understanding will be important, given its use for type I aortic dissections.

While the immediate intent of treatment of type I dissections is to save the patient’s life, it has become well recognized that there are downstream effects of the residual dissection,⁶ which has led to a greater enthusiasm more recently for the use of FET in this setting. Consequently, there has been focus on development of devices such as the Frozenix graft (Japan Lifeline Co, Ltd, Tokyo, Japan) to accomplish this goal. Furthermore, the use of FET technique has spurred the HEADSTART (Hemiarch vs Extended Arch in Type 1 Aortic Dissection) trial to examine the impact of stented-extended total arch replacement in a randomized fashion in type I dissections.⁷ As a result, with an increased enthusiasm and use of the FET technique, it is important for our community to consider ways to improve on the results of FET while doing our best to minimize distal SINE. Perhaps most importantly is to better define what the incidence of distal SINE with FET is and whether the risk factors are similar to that of traditional TEVAR or whether other risk factors are present. In addition, one area of potential impact is the design of stent graft prostheses that are less rigid and more conformable to help prevent the potential drawbacks of “spring back.” Furthermore, consideration should be given to more definitive stent grafting at the time of dissection, particularly in the setting of a hybrid operating room.

As the treatment for acute type I aortic dissections continues to evolve and the long-term nature of this pathology is better understood, the role of FET will likely continue to grow. Accordingly, we as a community must continue to pay attention to potential unintended consequences such as SINE and how to best prevent them.

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