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Commentary: The devil is in the details

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CENTRAL MESSAGE

Repair of Crawford extent II thoracoabdominal aortic aneurysm is complex and necessitates the use of multiple adjuncts to mitigate surgical risk.

The surgical management of thoracoabdominal aortic aneurysm (TAAA) remains a high-stakes endeavor for both surgeon and patient; this includes the technical aspects of this complex procedure and the risk of life-altering postoperative complications or death, respectively. In recent years, significant strides have been made toward improving outcomes of hybrid and total endovascular repair; the former being an off-label application, and the latter being restricted to the purview of clinical trials as part of physician-sponsored investigational device exemptions. The Crawford classification system defines an extent II TAAA repair as one that extends from the region of the left subclavian artery to the aortic bifurcation and may additionally encompass the iliac arteries; it remains the most challenging and greatest-risk repair of all forms of TAAA.^{1,2} In this issue of *JTCVS Techniques*, the talented and experienced aortic group from the Department of Cardiac Surgery, St Bartholomew's Hospital, London, United Kingdom, describe their step-by-step approach to the open repair of Crawford extent II TAAA with appropriate detail and well-chosen images.³ Importantly, in addition to the specific technicalities with regards to replacing the entire thoracoabdominal aorta with Dacron graft, they provide

a detailed description regarding their use of several surgical adjuncts to mitigate operative risk, including left heart bypass, cerebral spinal fluid drainage, motor-evoked potential monitoring, as well as visceral and renal perfusion. In an extensive and complex operative procedure, such as the in situ replacement of an extent II TAAA, the devil is in the details. Herein, the authors provide clear, concise, and eminently useful descriptions of their approach. Consequently, for those surgeons desiring to pursue such procedures, this manuscript serves a noteworthy contribution to the literature.

It is important to understand that with regards to the spectrum of adjuncts that may be considered for use in extent II TAAA repair, there is substantial variation in how they are regarded. For example, the use of cerebral spinal fluid drainage is well established, in widespread use, and recommended by current aortic guidelines.^{4,5} In contrast, the use of adjuncts such as motor-evoked potential monitoring and visceral perfusion is less established, with the related literature being less dogmatic and without formal recommendation. Consequently, in establishing or evolving a surgical program, detailed descriptions, enhanced by photos and illustrations, such as the authors provide, serve as an essential reference.

A key to providing excellent results to patients undergoing complex, high-risk cardiovascular procedures is the establishment of a surgical program with a dedicated team. The inclusion of committed anesthesiologists, nurses, perfusionists, cardiologists, radiologists, and critical care specialists—who are devoted to perfecting the

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many nuances in the management of these patients—is irreplaceable. Many successful programs make selections among the various options for surgical adjuncts to protect the brain, spinal cord, viscera, and kidneys; they set a course establishing proficiency by following evolutionary, rather than revolutionary, alterations to their overall approach by refining techniques as reliable information becomes available. For the foreseeable future, the continued refinement of protective adjuncts is an area for which maintaining our open operative skills remains crucial.

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