Commentary: Thoracic aortic surgery is all about the brain

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In this issue of the *Journal of Thoracic and Cardiovascular Surgery*, the International Registry of Acute Aortic Dissection Registry group report the neurologic outcomes of 648 patients who underwent thoracic endovascular aortic repair (TEVAR) for complicated acute type B aortic dissection between 1996 and 2021.1 The incidence of perioperative neurological events was 11.1% (stroke 4.6%, spinal cord ischemia 3.3%, transient ischemic attack 2.6%, and coma 1.0%). This translated into a higher rate of in-hospital mortality. Female sex and aortic rupture were identified as independent predictors of neurological event after TEVAR. Because women had a smaller body surface area than men (1.9 vs 2.1 m²) but had similar size stents implanted, the authors concluded that the relative stent oversize in women might have contributed to the increased risk of neurological complications.

This is one of the largest international multicenter series to date on neurological outcomes after TEVAR for acute type B aortic dissection. Regarding the “high” risk of neurological events, we agree with the authors that although the reported rate of neurological complications falls within the range of previously reported data, it is too high in the current era of advanced endovascular aortic therapy. The lack of homogeneity in the treatment and management in large multicenter databases might limit the interpretation of these results. We believe that the implementation of standardized TEVAR protocols for cerebral and spinal cord monitoring and protection play a critical role in operative outcomes. In fact, patients who had left subclavian arterial revascularization were excluded from this study. In addition, there are no data on left subclavian artery coverage, or the spinal cord protection strategy including blood pressure augmentation, spinal fluid drainage, and intraoperative neurologic monitoring. Although it is reasonable to assume that some neurological protective measures were taken in the participating aortic centers, it is safe to assume that they were not homogenous, which obscures the interpretation of the results.

Regarding aortic rupture as an independent risk factor for neurological events, this is somewhat expected because of the urgency of the procedure with limited time for planning and incorporation of all adjunct methods for neurological protection. This is also complicated by the labile hemodynamic state that contributes to cerebral, spinal, and global malperfusion.

Regarding female sex as an independent risk factor for neurological events, it is plausible, as the authors speculate, that stents might have been oversized in women. However, the issue might be much more nuanced. The authors report a higher rate of chronic obstructive pulmonary disease among women compared with men (29.4% vs

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Disclosures: The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Feb 23, 2022; revisions received Feb 23, 2022; accepted for publication Feb 24, 2022; available ahead of print March 3, 2022.

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J Thorac Cardiovasc Surg 2024;167:63-4

0022-5223/36.00

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https://doi.org/10.1016/j.jtcvs.2022.02.038
6.1%), which might be a confounding factor considering the known association of lung disease with worse outcomes after thoracic aortic surgery.\textsuperscript{2} In parallel, natural history and surgical outcomes data from ascending aortic aneurysms and dissections indicate worse outcomes at smaller aortic sizes in women, even when the treatment is adjusted for aortic size.\textsuperscript{2-4} We agree with the authors that stent–graft technology should be modified to consider sex differences in aorta, but more basic scientific studies are needed to identify the biomechanical differences between men and women.

References