OPTIMAL ARCH REPAIR IN ACUTE TYPE A AORTIC DISSECTION: STRIKING A BALANCE BETWEEN SAFETY AND EFFICACY

To the Editor:

With great interest we read the study by Elbatarny and colleagues,1 which analyzed hemiarch vs extended arch repair (EAR) in settings of acute type A aortic dissection (ATAD) repair. We congratulate their comprehensive analysis of national data to address optimal strategy for arch repair in ATAD. We have several questions to better understand their study.

DEFINITION OF EAR AND OUTCOME

In this study, use of the Ascyrus Medical Dissection Stent (AMDS) (Cryolife) was classified as EAR, which comprises 17% of the EAR cohort. This technique is technically similar to hemiarch repair except for AMDS insertion and anastomosis. Conversely, partial or total arch repair (TAR) requires reconstruction of supra-aortic vessels that usually requires longer cardiopulmonary bypass time or circulatory arrest time of the lower body. Another important aspect when discussing EAR is the rate of spinal cord ischemia (SCI). In a large meta-analysis,2 SCI was not negligible after TAR with elephant trunk procedures, with an incidence of 2.6% for ATAD. In the present study, there was a trend that EAR, which includes AMDS, showed a higher SCI rate (EAR, 3.8% vs hemiarch, 1.7%; P = .059). This is among the potential drawbacks of using frozen or classical elephant trunk technique because mortality after permanent SCI is significant. On the other hand, AMDS use for ATAD repair showed excellent results of SCI (0%) in a multicenter trial.3 We wonder if outcomes could be different regarding SCI if the authors did a subanalysis excluding the AMDS group from the EAR group or regrouping patients who received reconstruction of supra-aortic vessels and regrouping.

DISTAL ANASTOMOSIS

Among the challenges of EAR compared with ascending or hemiarch repair is deeper distal aortic anastomosis. Proximization of distal aortic anastomosis in EAR, instead of Zone 3 distal anastomosis, seems reproducible and safe in EAR for ATAD repair.4,5 Takagi and colleagues4 reported Zone 0 TAR using frozen elephant trunk technique with excellent outcomes. We reported simplified Zone 2 arch repair without elephant trunk insertion,5 which provides similar technique and cardiopulmonary bypass time with an endovascular option if necessary. In the EAR group, especially in patients who underwent TAR, it would be great to add information about the level of distal anastomosis to demonstrate the extent of repair in this group.

CANNULATION SITE

Arterial cannulation site is a crucial part of ATAD repair.6,7 A growing body of evidence suggests that axillary artery cannulation is superior to other cannulation strategies. Compared with femoral artery cannulation, the axillary artery is free from atherosclerosis, facilitating perfusion of the true lumen and easy transition to selective antegrade cerebral perfusion if necessary. It would be of interest to explore if cannulation site is similar between the hemiarch and EAR groups in this cohort. If the authors could comment on these points, it would add significant insights on their suggestive data.

Conflict of Interest Statement

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.

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TYPE A DISSECTION
Reply to the Editor:

We thank Gregory and colleagues for their interest in our study of hemiarch (HA) versus extended arch (EA) repair in acute type A dissection (ATAD) by the Canadian Thoracic Aortic Collaborative (CTAC).1,2 Their commentary highlights several important challenges when using retrospective data to understand this clinical question.

The definition of EA repair was the subject of significant debate among the co-authors. The surgical techniques varied considerably across the 9 centers and evolved over the 20-year study period. We hypothesized the following: (1) The risk of cerebral injury would increase with reconstruction of the supra-aortic vessels (partial/total arch repair at zones 1-3 ± frozen/conventional elephant trunk); (2) the risk of spinal cord injury (SCI) would increase with covered stents; and (3) improved resolution of malperfusion would occur with any distal stent. Each of these hypotheses would require different comparator groups, smaller numbers, and analytic challenges. Furthermore, the limitations of a retrospective database became apparent, with some variables such as the zone of distal anastomosis and method of arch vessel reconstruction inconsistently reported.

Ultimately, we decided to include any technique that involved more intervention on the distal aorta than an HA in the EA arm. This meant including patients with an HA and antegrade thoracic endovascular aortic repair or Ascyrus Medical Dissection Stent (AMDS) in the EA arm, with the rationale being that having a stent in the distal aorta would improve distal malperfusion. Nevertheless, both techniques do not require arch vessel reconstruction and as such may have lower rates of neurological injury.

Furthermore, the AMDS does not have any reported risk of SCI.3 In our series, eliminating the small number of patients with an AMDS from the EA arm did not change the overall SCI rate; however, we observed no new SCI events in any patient with the AMDS. However, the rate of stroke and permanent neurological injury was not different between the 2 groups. Patients may have had subtle neurological deficits that were not reported and would certainly have a higher incidence of lesions observed on cerebrovascular imaging than the clinical diagnostic rate for neurological events.2,5

Last, we agree that the cannulation site is critical to the conduct of ATAD repair. Although outside the scope of this study, we have previously studied the impact of cannulation strategy on ATAD outcomes in both the CTAC1 dataset and the International Registry of Aortic Dissection7 data. Interestingly, although our CTAC analysis found benefit of axillary cannulation with respect to mortality and stroke risk, International Registry of Aortic Dissection data demonstrated equivalent perioperative outcomes. Overall, it seems that aortic repair and cerebral protection strategies, restoration of malperfusion, and patient factors may more strongly impact outcomes than cannulation strategy.

In summary, the optimal arch repair strategy in ATAD remains controversial. Large multicenter data from organizations such as CTAC overcome some of the challenges associated with retrospective studies. Going forward, TITAN:HEADSTART (NCT03885635), the first randomized trial in ATAD, will aim to provide insight on the optimal arch repair strategy in ATAD by randomizing patients to EA versus HA and including core computed tomography laboratory follow-up.

Malak Elbatarny, MD
Munir Boodhwani, MD, MMSc
Michael W. A. Chu, MD, Med
Jehangir J. Appoo, MDCM
Maral Ouzounian, MD, PhD

“Division of Cardiovascular Surgery, Department of Surgery, Toronto General Hospital, University of Toronto, Toronto, Ontario, Canada
bUniversity of Ottawa Heart Institute, University of Ottawa, Ottawa, Ontario, Canada
cDivision of Cardiac Surgery, University of Western Ontario, London, Ontario, Canada
dLibin Cardiovascular Institute, University of Calgary, Calgary, Alberta, Canada

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