It is important to determine whether the aorta can be safely clamped in each patient and what type of calcification is related to critical cerebral infarction.² Nishi and colleagues³ reported that the aorta could be clamped safely when calcification was less than 75% of its circumference. However, cerebral infarction was encountered in less calcified cases. In those cases, calcification was not circumferentially distributed, but there was thick intima. By clamping such a portion, bulky emboli might have been generated and caused cerebral infarction. Special attention should be paid to a calcified aorta that looks double-layered on computed tomography scan (Figure 1). In this type, a soft atheroma may be included between 2 layers and pushed out by clamping the aorta, becoming a critical embolus.

Hideaki Nishimori, MD
Masaki Yamamoto, MD
Kazumasa Orihashi, MD
Department of Surgery II
School of Medicine
Kochi University
Nankoku, Kochi, Japan

References

1. Idrees J, Roselli EE, Raza S, Krishnaswamy A, Mick S, Kapadia S, et al. Aborted sternotomy due to unexpected porcelain aorta: does transcatheter aortic valve replacement offer an alternative choice? *J Thorac Cardiovasc Surg.* 2015;149:131-4.
2. LeMaire SA. Individualized treatment strategies for patients with aortic valve disease and porcelain aorta. *J Thorac Cardiovasc Surg.* 2015;149:134-6.
3. Nishi H, Mitsuno M, Ryomoto M, Miyamoto Y. Comprehensive approach for clamping severely calcified ascending aorta using computed tomography. *Interact Cardiovasc Thorac Surg.* 2010;10:18-21.

<http://dx.doi.org/10.1016/j.jtcvs.2015.05.041>

THE FROZEN ELEPHANT TRUNK

To the Editor:

Shesthra and colleagues¹ have reported their entire experience since 2001 with the elephant trunk (ET) and frozen elephant trunk (FET) procedures, for treatment of acute and chronic type A dissection and of aneurysm. Their results have led them to increasingly apply the FET technique to the management of these 3 conditions. In their discussion, however, the authors fail to acknowledge the 1-stage open technique using a conventional (unstented) polyester graft as another option for the treatment of extensive thoracic aortic disease. Although the 1-stage procedure has been used infrequently for the treatment of acute type A dissection, cumulative experience has created a body of evidence on use of this technique for the management of chronic type A dissection, chronic type B dissection with retrograde extension, and aneurysm.²⁻⁴

Our experience with the 1-stage technique now encompasses 118 patients, with follow-up extending to 14 years, and it includes 75 patients who have chronic type A or chronic type B dissection with antegrade extension, and 39 patients who have degenerative aneurysms. We have recently reported on our experience with this procedure for extensive chronic thoracic dissection in 68 patients, and we invite comparison with the experience of treating 51 patients who had chronic dissection and were treated with the FET, reported by Shesthra and colleagues.^{1,4}

The baseline characteristics of our patients did not differ appreciably from those of Shesthra and colleagues, including a high prevalence of previous thoracic aortic procedures (91% vs 69%, respectively). Hospital mortality for our series was 2.9%, versus 8% in the series of Shesthra and colleagues; Occurrence of reoperation for bleeding was 9% versus 20%; stroke was 1.5% versus 12%; and renal failure requiring dialysis was 7.5% versus 18%. The intraoperative transfusion requirements were comparable.

Of greater concern, however, is the non-negligible occurrence of important spinal cord ischemic injury (paraplegia, paraparesis) that has been reported with use of the FET. In reported single series and meta-analyses, it has ranged as high as 25%.^{5,6} In the series of Shesthra and colleagues,¹ the prevalence with the FET was 5%, and it was highest for the subset of patients with acute dissection (9%).¹ Such injury occurred with lower frequency in the chronic dissection (2%) and aneurysm (3%) groups. For the conventional ET procedure, in some of the largest reported series,⁷⁻¹¹ encompassing a total of >1300 patients, primarily with chronic dissection or aneurysm, the prevalence of this complication ranged from zero to 0.4%. The prevalence was also zero in patients with aneurysm or chronic dissection who had conventional ET repair, in the series of Shesthra and colleagues.¹

In our experience with the 1-stage technique in 118 patients with chronic dissection or aneurysm, most of whom had replacement of half or more of the descending thoracic aorta, spinal cord ischemic injury (paraplegia) occurred in 1 patient (0.8%). Thus, for patients with chronic dissection or aneurysm, the role of a procedure that has consistently resulted in a not-insignificant incidence of spinal cord ischemic injury, with the knowledge that patients with this devastating complication do poorly over the long term, must be seriously questioned. At least 2 other procedures, with comparable early mortality and other morbidity rates, can be performed with a near-zero occurrence rate of this complication. For patients with acute dissection, traditional repair, consisting of ascending aortic repair, or ascending repair and arch replacement, is additionally associated with a near-zero rate of spinal cord ischemic injury, and thus calls into question the role of the FET in this condition as well.

Author has nothing to disclose with regard to commercial support.

Nicholas T. Kouchoukos, MD
Department of Cardiothoracic Surgery
Cardiac, Thoracic & Vascular Surgery Inc
St. Louis, Mo

References

- Shrestha M, Beckmann E, Krueger H, Fleissner F, Kaufeld T, Koigeldiyev N, et al. The elephant trunk is freezing: the Hannover experience. *J Thorac Cardiovasc Surg.* 2015;149:1286-93.
- Minale C, Splittgerber FH, Wendt G, Messmer BJ. One-stage intrathoracic repair of extended aortic aneurysms. *J Card Surg.* 1994;9:604-13.
- Sun XG, Zhang L, Yu CT, Qian XY, Chang Q. One-stage repair of extensive aortic aneurysms: mid-term results with total or subtotal aortic replacement. *Interact Cardiovasc Thorac Surg.* 2014;18:278-82.
- Kouchoukos NT, Kulik A, Castner C. Clinical outcomes and fate of the distal aorta following one-stage repair of extensive chronic thoracic aortic dissection. *J Thorac Cardiovasc Surg.* 2013;146:1086-91.
- Cao P, DeRango P, Czerny M, Evangelista A, Fattori R, Nienaber C, et al. Systematic review of clinical outcomes in hybrid procedures for aortic arch dissections and other arch diseases. *J Thorac Cardiovasc Surg.* 2012;144:1286-300.
- Leontyev S, Borger MA, Etz CD, Moz M, Seeburger J, Bakhtiari F, et al. Experience with the conventional and frozen elephant trunk techniques: a single-centre study. *Eur J Cardiothorac Surg.* 2013;44:1076-82.
- Schepens MA, Dossche KM, Morshuis WJ, van den Barselaar PJ, Heijmen RH, Vermeulen FE. The elephant trunk technique: operative results in 100 consecutive patients. *Eur J Cardiothorac Surg.* 2002;21:276-81.
- Safi HJ, Miller CC III, Estera AL, Huynh TT, Porat EE, Allen BS, et al. Staged repair of extensive aortic aneurysms: long-term experience with the elephant trunk technique. *Ann Surg.* 2004;240:677-85.
- LeMairé SA, Carter SA, Coselli JS. The elephant trunk technique for staged repair of complex aneurysms of the entire thoracic aorta. *Ann Thorac Surg.* 2006;81:1561-9.
- Etz CD, Plestis KA, Kari FA, Luehr M, Bodian CA, Spielvogel D, et al. Staged repair of thoracic and thoracoabdominal aortic aneurysms using the elephant trunk technique: a consecutive series of 215 first stage and 120 complete repairs. *Eur J Cardiothorac Surg.* 2008;24:605-15.
- Svensson LG, Rushing GD, Valenzuela ES, Rafael AE, Batizy LH, Blackstone EH, et al. Modifications, classification, and outcomes of elephant-trunk procedures. *Ann Thorac Surg.* 2013;96:548-58.

<http://dx.doi.org/10.1016/j.jtcvs.2015.06.052>

Notice of Correction

Re: Liu H-H, Chien T-M, Chen Y-F. Are there really differences between acute aortic dissections in Eastern and Western populations [letter]? *J Thorac Cardiovasc Surg.* 2015;149:1680-1.

In the above-referenced letter to the Editor, 4 of the references in the reference section were numbered incorrectly. Current reference 8 should be reference 9, current reference 9 should be reference 10, current reference 10 should be reference 13, and current reference 13 should be reference 8. The correct reference section is reprinted on the next page.

As a result of the reference numbering error, cited reference numbers in text were incorrect in 2 sentences. On page 1680, right column, the corrected sentence should read, “In contrast, higher incidences were reported from IRAD (70.3%),¹¹ Japan (78.2 %),⁴ and Taiwan (83.1%).⁶” On page 1680, right column, the corrected sentence should read, “Fifth, the authors reported a lower in-hospital mortality in patients with TA-AAD repair (5.3%) compared with that of IRAD (23.6%).¹¹”

The following reference citations should be corrected in Table 1. In the “<40 y” row, the correct reference citation for “7/133 (5.3)” is 8. In the “Chest pain” row, the correct reference citation for “1453/1873 (77.6)” is 13. In the “Back pain” row, the correct reference citation for “39/133 (29.3)” is 8 and the correct reference citation for “774/1873 (41.3)” is 13. In the “IMH” row, the correct reference citation for “64/1808 (3.5)” is 15. The corrected table is reprinted on the next page.