Total arch for type A dissection?

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There's too much confusion, I can't get no relief.

—Jimi Hendrix, “All Along the Watchtower”

I'm like Mr Hendrix in “All Along the Watchtower.” The appropriate approach to acute DeBakey type I dissection repair is quite confusing, and the literature guiding which type of surgery is best certainly doesn't give me any relief. In this issue of the *Journal of Thoracic and Cardiovascular Surgery*, Omura and colleagues¹ attempt to assuage Little Jimi's (and the cardiothoracic surgeon's) plight by presenting their data on acute DeBakey type I dissection repaired with either total arch replacement (TAR) or nontotal arch replacement (non-TAR). They attempt to clarify whether the extent of arch replacement affects early or late outcomes with respect to perioperative morbidity and mortality and the need for late reintervention. Long-term survival is also analyzed. Is there still “too much confusion” after we read this article?

Omura and colleagues¹ are to be congratulated for excellent short- and long-term outcomes in a high-risk cohort of patients. The in-hospital mortality was 12.5%, and the rate of new neurologic deficits was 7%. There was no difference in either of these parameters regardless of whether a patient underwent TAR, despite the significant selection bias against the non-TAR group (significantly more preoperative shock, need for preoperative cardiopulmonary resuscitation, older age). The results are even more impressive when considering that nearly half of the 197 patients analyzed underwent TAR with a mean antegrade cerebral perfusion time of 124 minutes. The actuarial 10-year survival was approximately 80% for all patients, and the freedom from reoperation was approximately 87% for the entire cohort. Again, there was no significant difference in survival or need for reintervention regardless of the surgical approach. The effectiveness of aggressive TAR repair becomes obfuscated, however, when one dives more deeply into the details of the data and tries to extrapolate these results into meaningful real-world practice for the surgeon confronted with the task of dissection repair. The 3 most important questions unfortunately are still left unanswered:

(1) Which patients should undergo TAR? (2) Does TAR actually reduce the need for late aortic reintervention? (3) Do patients who undergo TAR live longer?

Omura and colleagues¹ recommend TAR for 4 specific groups of patients: those with an enlarged aortic arch (not defined), severe dissection involving the supra-aortic orifices, younger patients, and those with connective tissue disorders (CTD). As a high-volume aortic center, this group was able to perform complex TAR repair without any increase in perioperative mortality or neurologic injury. The data supporting these recommendations are clouded, however, by the decision to exclude from analysis 8 patients with CTDs and to include distal aortic growth (along with distal reintervention) in their calculations of freedom from distal aortic events. Seven of the 8 excluded patients with CTDs underwent TAR. Five of these 8 went on to need additional surgery on the residual aorta. When one repeats univariate analysis by including these patients, the advantage of TAR in preventing distal aortic events is lost. Furthermore, when one analyzes the non-TAR group for downstream surgery after type I repair, we find that a majority of these reoperations were actually on the distal arch. Only 1 late reoperation in the non-TAR group was needed distal to the left subclavian artery. Given that only 15%

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Central Message

Total arch for type A dissection is not recommended for a majority of patients undergoing emergent dissection repair.

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of patients after type I repair go on to need additional surgery for their residual dissections,² it is difficult to recommend complicated TAR for acute type I dissection on the basis of these biases. Could we make better use of these data by taking advantage of their excellent computed tomographic imaging program to analyze the diameter of the arch at the time of the index procedure to define better the patients to whom we should offer TAR? Should we pool data on those with known CTDs undergoing type I repairs to see whether their long-term survival and freedom from reoperation are truly improved with complex TAR repair?

One critical piece of information provided by Omura and colleagues¹ that may be as valuable as what type of surgery is needed is the impact of long-term follow-up imaging. Omura and colleagues¹ took ownership of these cases after surgery and should be commended for showing us that this level of commitment can largely eliminate the nearly 15% incidence of fatal late aortic rupture as a cause of death.³ They were able to identify and act on problems before rupture ensued. To their credit, none of the patients needing second procedures on the aorta died of their reoperations.

We clearly, however, have much work to do. Large database analysis of contemporary type I dissection repair still shows a soberingly high mortality of 20% in all comers.⁴ Common sense dictates that this mortality, and the neurologic injury rate, would be even higher if we tried to apply TAR more aggressively, especially in those centers less

experienced in complex arch surgery (which is actually where most patients with type I dissection actually undergo surgery). Perhaps innovative approaches such as the frozen elephant trunk approach to acute type I dissection will prove efficacious in significantly reducing the need for complex late aortic reintervention. Time will tell. Before we can expect any relief from the literature in providing more patient-specific guidelines for the appropriate type of surgery for acute type I dissection, however, we will need to eliminate the confusion generated by selection bias. We have to dive deep into the data to make certain we don't convince ourselves of the necessity for complexity when a keep it simple approach that provides excellent short-and long-term outcomes seems to suffice.

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