Surgery for extensive, chronic aortic dissection: What about the elephant (trunks) in the room?

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Central Message

One-stage repair of chronic aortic dissection provides reliable results. Availability of less-invasive alternative techniques mandates thorough evaluation to determine what is best for each patient.

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In this issue of the *Journal*, Kouchoukos and colleagues¹ present their latest update on perioperative outcomes and long-term follow-up of patients with chronic, extensive aortic dissection who undergo 1-stage replacement of aneurysmal aorta through a bilateral “clamshell” thoracotomy. During a 21-year period, the senior author replaced the ascending aorta, arch, and varying lengths of the descending thoracic aorta in patients under deep hypothermic circulatory arrest, mostly patients who had previously undergone surgery for an acute type A dissection. The distal extent of descending thoracic aorta repair was dictated by an aortic diameter of 4.5 cm or less. All patients with larger aortas were relegated to 2-stage, open reconstruction. Despite the herculean efforts required to complete these operations successfully, the results were outstanding. Operative mortality (OM) was 2.5%, with a gratifyingly low incidence (1.2%) of both spinal cord injury and stroke. Durability was also reassuring, with a 93% actuarial freedom from reoperation for aneurysmal growth of the contiguous distal aorta at 10 years. Morbidity, however, was not insignificant. The incidence of temporary neurologic dysfunction was 14%, and significant ventilator support was necessary for nearly half of the 80 patients. Tracheostomy was ultimately required in 15% of cases, and substantial blood transfusions were required to obtain hemostasis. The mean hospital stay was 20.5 days. Without question, this operation works. Is this approach too aggressive, however, for the less than 30% of patients in need of downstream surgery after surviving acute type A repair?² When surgery is necessary, how far distally should we proceed? Finally, is there any role for such an operation in an era of possible 1-stage endovascular repair (elephant 1)? Should anyone undergo a traditional 2-stage repair (elephant 2)?

Contemporary experiences with a frozen elephant trunk (FET) technique for extensive chronic dissection show its promise as a less invasive alternative to open 1-stage repair. In an earlier experience with 89 patients undergoing total arch and FET repair of chronic type A dissection, Sun and colleagues³ reported an OM of only 1.1%. The mean age

of these patients was quite young, however, and none had a descending thoracic aorta segment longer than 5 cm. A cohort of patients more representative of that seen in that in the report of Kouchoukos and colleagues¹ tells a more cautionary tale.⁴ In 509 patients undergoing FET through a sternotomy and with antegrade cerebral perfusion, the OM was 15.9%. When looking more closely at the 160 patients with either chronic type A or B dissections, the OM was 16.9% with a significant incidence of both spinal cord injury (7.5%) and permanent neurologic deficit (7.7%). Of the entire cohort, 26.5% had significant respiratory insufficiency develop, although the need for tracheostomy after this less-invasive alternative was not reported.

For those choosing a 2-stage technique, the outcomes are unfortunately more similar to that seen with FET than to that seen with the clamshell 1-stage repair. Etz and colleagues⁵ reported on 139 patients who completed both stages. The OM for those completing stage 2 was 7.5%, in addition to the 6% OM seen for stage 1. Spinal cord injury occurred in 2% and permanent neurologic deficit in 7% of those undergoing both operations. The need for tracheostomy was surprisingly low after stage 2 (4.1%) but was offset by a higher than expected 13% incidence after the first-stage sternotomy. One further consideration is that for the 18 patients who did not come for their planned stage 2 surgery, 16 died within a mean of 5.4 months.

It is clear that patients who need surgery for extensive, chronic aortic dissection incur substantial risk regardless of technique chosen. The future is promising for a less-invasive option that may markedly reduce the need for additional operations. We should not, however, ignore the more invasive, but perhaps more reliable, elephant (trunk) being made to sit quietly in the corner. Patients should be given the option that is judged to have the best opportunity for success on the basis of their comorbidities and aortic anatomy.

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