Commentary: Location, location, location

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Two decades ago, the primary approach to acute aortic dissection was simple: open ascending aortic replacement for type A; and optimal medical management for type B. We accepted this conservative stance, because the main goal was early survival.¹

Continuing advances in cardiovascular surgery, however, have led to significant improvements in the early outcomes of acute repair—both in total arch replacement (TAR) for type A and thoracic endovascular aortic repair for type B. In addition, growing emphasis has been given to reducing late complications after dissection.² Much focus has also been placed on identifying risk factors for late complications, such as larger total diameter, larger false-lumen diameter, tear location in the lesser curve of the arch, size of the tear, and number of tears.³⁻⁵

In their report in this issue of the *Journal*, Heo and colleagues⁶ have added to our understanding about the risk factors for late aneurysmal degeneration after aortic dissection. In their study, Heo and colleagues⁶ included only patients who underwent transverse TAR after acute type A aortic dissection, survived for follow-up, and had sufficient imaging for analysis. A thorough radiographic analysis was performed with parameters that were reasonable. Specifically, 40 patients met the criteria for evaluation, and the aorta was divided into 3 levels (upper descending, lower descending, and abdominal) in which tear locations and sizes were recorded. Interestingly, only intimal tears larger than 3 mm located in the upper descending thoracic aorta (zone 1) and number of visceral vessels arising from the false lumen were significant risk factors associated with late aortic dilatation.

As acknowledged by Heo and colleagues,⁶ the main limitation was the small cohort size. Despite this, some observations warrant mention:

1. Repaired type A dissection exhibits similar behavior to type B dissection with regard to natural history. Many previous reports on the late complications of repaired type A dissection included all repair types, ascending and hemiarch repair as well as TAR, and it is well recog-

Descending dissection flap with proximal tear during open repair.

Central Message

When it comes to tears in aortic dissection, location remains the key variable.

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nized that a significant risk for distal transverse arch and proximal descending thoracic aneurysm formation is increased when less extensive repairs are performed. Heo and colleagues⁶ included only TAR procedures, eliminating the unrepaired arch as an issue. When repaired type A dissection included the transverse arch, the natural history appeared to be similar to that of acute type B aortic dissection.

2. When performing TAR for acute type A aortic dissection, frozen elephant trunk (FET) should be considered. Heo and colleagues⁶ reported no difference between TAR and TAR with FET in terms of late reintervention—and no difference in complete thrombosis of the false lumen at any level. They did, however, report 27% (7/26) distal endoleaks when TAR was performed without FET, which resulted in tears in zone 1 (the proximal descending thoracic aorta.) As would be expected, these were likely suture holes that occurred in the distal arch anastomosis. Despite this, Heo and colleagues⁶ recommended TAR with FET only when tears were identified in the proximal descending thoracic aorta at initial type A repair. Taking this one step further, performing the TAR with FET does not require more technical expertise than TAR alone, because the anastomoses are the same, but does provide a platform, the stent graft, to facilitate future endovascular interventions, if required. For those concerned with the increased risk of paraplegia with TAR and FET, the staged zone 2 repair may be considered.⁷

3. Tear location is important. Heo and colleagues⁶ corroborate others' work analyzing tear size and location and their relationships to late complications. It can be speculated that the larger tears located in the proximal descending thoracic aorta lead to increased pressures in the false channel—especially when there are no outflow fenestrations.⁸ It remains unknown how the increased pressures affect the integrity of the dissected aortic wall, leading to aneurysmal degeneration.

Accepting that this report is limited by its small cohort size, it still corroborates others' work analyzing risk factors for late complications after acute aortic dissection. In summary, when talking about tears in aortic dissection, it is all about *location, location, location*.

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