Commentary: A lethal disease begging for treatment consensus

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Malperfusion of celiac artery and hemopericardium with acute type A aortic dissection.

Central Message

The surgical repair of acute type A aortic dissection involves multiple technical steps performed on an emergency basis at high stakes. A standardized approach seems reasonable and appropriate.

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In this issue of the *Journal*, Leshnower and associates¹ presents results in 34 patients with acute type A aortic dissection with mesenteric malperfusion during a 14-year period. They originally proposed an approach of thoracic endovascular aortic repair (TEVAR)—first repair in 2014 in an attempt “to improve the dismal outcomes associated with this malperfusion syndrome” and stated that the goal of this paradigm was to expand the true lumen mechanically and increase inflow into the distal aorta.² Their current summary¹ again supports a TEVAR-first approach for these patients with a known risk of high mortality (55.8% in this series) and 100% mortality when associated with severe acidosis.³ This paradigm involves TEVAR followed by ascending aortic replacement after a variable delay. This innovative approach addresses a need to improve operative mortality and outcomes with this lethal disease.

Similar to other published experiences of treatment of type A aortic dissection, the patients are a diverse group with a variety of surgical treatments, including ascending aorta with or without arch followed by laparotomy, axillary-bifemoral bypass followed by ascending aorta with or without arch replacement, ascending aorta with or without arch replacement with antegrade TEVAR, and TEVAR-first approach followed by delayed ascending aorta with or without arch replacement. Treatment was based on surgeon preference and varied with time. Because there are multiple technical steps that must be orchestrated in the surgical treatment of an acute type A aortic dissection (Table 1), and these operations are often performed at late hours or on weekends (because of delay in diagnosis or transfer between hospitals), a standardized approach seems reasonable, safe, and appropriate.

The patients in the TEVAR-first group were in stable condition at the time of presentation, and contraindications to this strategy included hemodynamic instability, cardiac tamponade, respiratory compromise,

hemopericardium, intractable chest pain, evolving stroke, coronary malperfusion, and severe aortic insufficiency. These exclusion criteria are precisely the reasons that aortic surgery is typically *not* delayed, because 50% of patients die within the first 48 hours.⁴ The TEVAR-first group was thus in more stable condition on presentation and (except for 1 patient who died waiting) were likely selected to survive, introducing inherent bias. Leshnower and associates¹ suggest that delay in ascending aorta replacement in the TEVAR-first group as a bridge to decision tool is justified. This may save the resources needed for aortic replacement and postoperative care; however, information such as the time from symptom onset and lactate levels could also inform decisions. The mortality of this group was 30% (3/10); however, 3 patients did not survive until ascending aortic repair, making the actual mortality 46% (6/13), which was not significantly different from the other groups, given the small number in each.

Leshnower and associates¹ recommend axillary-bifemoral bypass followed by ascending replacement for patients in unstable condition. They note that this provides antegrade and retrograde flow in the aorta (and presumably to the abdominal viscera through a false lumen that may be dynamic). One might argue, why not just cannulate the femoral artery for bypass and expeditiously perform ascending replacement with deep hypothermic circulatory

TABLE 1. Multiple potential technical steps in emergency surgery for acute type A aortic dissection repair

Technical step	Options
Cannulation	Axillary, femoral, innominate, arch, or ascending aorta; percutaneous or open
Crossclamp	Yes or no
Cerebral protection	Yes or no; retrograde or antegrade
Temperature during circulatory arrest	18°C-25°C
Resumption of flow after DHCA	Antegrade or retrograde
Hemiarch	Yes or no
Elephant trunk	Yes or no
TEVAR first	Yes or no
Antegrade TEVAR	Yes or no
Root replacement	Yes or no
Aortic valve replacement	Yes or no
Choice of suture material, use of adjuncts for hemostasis, graft material	

DHCA, Deep hypothermic circulatory arrest; TEVAR, thoracic endovascular aortic repair.

arrest (protective for abdominal viscera), which will reestablish the true lumen? Percutaneous fenestration in a hybrid room (or open fenestration) may then be performed if malperfusion persists. In addition, perfusion through the

native aorta *and* the axillary-bifemoral route after cardiopulmonary bypass, as proposed by Leshnower and associates,¹ may introduce more intimal reentry tears as suggested by David.⁵

No standardization exists, and there are no guidelines regarding many of the technical steps of surgical repair of acute type A aortic dissection. A safe approach for any cardiac surgeon to get the patient out of the operating room alive has been described.⁶ Many questions regarding the best care for these patients are again raised by the current series of Leshnower and associates,¹ and they will remain unanswered without a randomized trial.

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