Commentary: Management of mesenteric malperfusion syndrome in patients with type A aortic dissection: An unsettled issue

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Acute type A aortic dissection (ATAAD) represents a life-threatening disorder of the cardiovascular system. Aortic rupture and cardiac tamponade are the most common cause of death.¹ Emergency surgery on the ascending aorta, with or without partial or total arch replacement, in most cases represents the only effective therapeutic option. Among all patients with ATAAD, those presenting with concomitant dissection-related severe malperfusion and consequent organ failure (malperfusion syndrome [MPS]) have a significantly increased mortality.²⁻⁷ In particular, mesenteric MPS has been reported to have a very poor prognosis, with an in-hospital mortality ranging from 60% to 75%. The optimal management of patients with ATAAD who have MPS remains an unsettled issue. With advancements in the endovascular treatment of aortic pathology, however, we have more choices to treat mesenteric MPS percutaneously before central aortic repair, and this strategy appears to be associated with improved outcomes.^{6,7}

In this issue of the *Journal*, Yang and colleagues⁸ present their decades-long work in trying to determine a better method to treat these patients at very high risk. From 1996 to 2017, they found 82 patients with ATAAD and mesenteric MPS, and they treated all of them with upfront interventional therapy before open aortic repair, in the hopes of resolving the visceral ischemia and its sequelae. To achieve endovascular reperfusion, a total of 113 fenestrations, 119 aortic stents, and 45 branch vessel stents were performed, together with a small number of branch vessel thrombolysis (n = 3) and suction embolectomy (n = 1) procedures. The operative mortality for the 82 patients with mesenteric MPS was significantly higher than that for those without mesenteric MPS (39% vs 7.5%; $P < .001$); for those who underwent both endovascular revascularization and open aortic repair, however, in-hospital mortality and major postoperative complications

were not significantly different from those of patients who had no mesenteric MPS (2.1% vs 7.7%; $P = .23$), suggesting that the impact of this complication could potentially be eliminated if promptly and successfully treated. Another important finding of Yang and colleagues⁸ is represented by the recognition of stroke, bowel necrosis at laparotomy, and elevated serum lactate (≥ 6 mmol/L) as independent predictors of death from organ failure after resolution of malperfusion. This is further important information that can guide us in selecting which patient would benefit the most from a staged approach. Moreover, the long-term survival for patients with mesenteric MPS surviving to hospital discharge was similar to those without MPS, and mesenteric MPS at admission was no longer a risk factor after patients were successfully treated with endovascular fenestration or stenting and recovered from MPS (hazard ratio = 0.8; 95% confidence interval, 0.4-1.4; $P = .37$).

Traditionally, the surgical community has emphasized the importance of emergency surgery, with the identification and resection of the primary tear and the replacement of the ascending or aortic arch to restore true-lumen perfusion. Given the presence of distal reentry tears, persistence of false-lumen flow, and potential for branch vessel involvement, however, the restoration of proximal true-lumen inflow may not consistently address the problem

Central Message

The modern treatment for type A aortic dissection requires careful planning, a wide range of expertise, and a multidisciplinary approach. Specialized aortic centers might be the solution.

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of distal malperfusion. With the progress of endovascular techniques, some centers have implemented a strategy of central aortic operation after percutaneous end-organ blood flow restoration in patients presenting with significant mesenteric MPS.^{6,7} The results from the study of Yang and colleagues⁸ support once more the current idea that the treatment of patients with ATAAD should be based on their clinical presentation, rather than just focusing on repairing the ascending aorta in the quickest possible way. There is an increasing body of evidence suggesting worse operative mortality and both short- and long-term outcomes in patients with concomitant MPS (and particularly mesenteric MPS), so our practice should consider a more careful evaluation of the patients to stratify their risk, allow better decision making, and tailor the surgical strategies on the basis of the predicted individual risk. Endovascular treatment of the malperfusion, when performed as a staged procedure with open central aortic repair, appears to improve both short- and long-term outcomes. In patients with clinically significant mesenteric malperfusion at presentation, it certainly seems reasonable to start the surgical treatment with an endovascular reversal of the malperfusion, followed by central aortic repair⁷ if the patient is in clinically stable condition and there is no evidence of cardiac tamponade or aortic rupture. In this setting, the hybrid operating room assumes an important role, permitting the precise diagnosis of downstream malperfusion sites and allowing surgical or endovascular treatment without delay and at small risk to the patient. We believe that this is the way forward, and once again we endorse the crucial role of dedicated specialized aortic centers in the modern treatment of acute aortic syndromes.⁹ As already demonstrated by other studies,¹⁰ such centers

provide better care for patients with ATAAD and have significantly improved outcomes in treating these very complex diseases.

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