Commentary: Acute type A aortic dissection and mesenteric malperfusion syndrome: Still a long way to go

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For patients experiencing an acute type A aortic dissection (ATAAD), mesenteric malperfusion syndrome (mesMPS), thankfully, is a rare entity. In the International Registry of Acute Dissection, only 3.8% of more than 1800 patients presenting with ATAAD developed this dreaded complication.¹ Patients at greater risk for mesMPS include those of older age whose intimal tear begins in the root. Those with chronic kidney disease and previous open-heart surgery are also more prone to develop mesenteric ischemia. Patients incurring mesMPS also have a significantly greater incidence of multiorgan malperfusion with a particular predilection for brain and spinal cord involvement. Not surprisingly, the hospital mortality associated with ATAAD and mesMPS was greater than 60% in this very large registry. What is extremely disappointing is that nearly one third of those diagnosed with this most lethal form of malperfusion were treated “medically.” Less than 5% survived without some form of intervention. For those undergoing surgical and/or endovascular procedures to relieve the malperfusion, the results were better, a mortality of 41.7%, but not great. Fortunately, for the patients triaged to Ann Arbor with ATAAD and mesMPS, Yang and colleagues² continue to tweak an alternative strategy that may be beginning to positively impact the outcomes for the unfortunate few presenting with this devastating complication.

For decades, the Michigan group has espoused the benefits of a strategy using endovascular techniques to, hopefully, resolve malperfusion syndromes before primary aortic repair. In this issue of the *Journal*, the authors report results on 82 patients presenting with mesMPS and ATAAD, comparing outcomes and highlighting lessons learned between the first and second decades of their experience.² The most important development in this latest report is that for those surviving the trip to the interventional radiology (IR) suite, the risk of aortic rupture while awaiting definitive aortic repair has been reduced from 21% (first decade) to 0% (second). The authors ascribe this improved success to more meticulous hemodynamic management

Acute type A dissection with malperfusion.

Central Message

Acute type A dissection and mesenteric malperfusion remain a lethal combination. Endovascular reestablishment of mesenteric perfusion before aortic repair is a strategy with improving outcomes.

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after the IR procedure as well as a reduction in the time allotted to resolve their metabolic derangements before surgery (7 days, first decade vs 4 days, second decade).

Their other key finding was that for those 47 who survived the initial hit of mesMPS and went on to aortic repair, their operative mortality was similar (2.1%) to those having ATAAD repair without any malperfusion syndrome at all (7.3%). Kudos to the authors and the consultants who put in untold hours toiling through complex resuscitations and laparotomies trying to salvage desperately ill patients. However, is this staged approach to ATAAD and mesMPS truly driving down the overall mortality for this condition when compared with a more traditional aortic repair-first strategy?^{3,4}

The scourge of preventable aortic rupture has always been the Achilles heel of the IR-first algorithm. The authors have demonstrated that attention to detail can substantially reduce the incidence of this event and, when successful resolution of the mesMPS occurs, the patients do very, very well. However, with the endovascular first approach, the authors were not able to reduce the absolute number or percentage of patients dying from organ failure and/or bowel necrosis. In the first decade, 10 of 52 (19.3%) died of organ failure, whereas in the more experienced decade, 10/30 (33%) experienced a similar fate. Total mortality between the decades (21/52, 40.3% first decade vs 10/30, 33.3% second decade) was also not significantly improved despite the elimination of fatal aortic rupture. On multivariable

analysis, patients presenting with stroke (odd ratio [OR] 23), a lactate >6 (OR 13.5), or those found to have bowel necrosis at laparotomy (OR 7) were particularly difficult to salvage. Is there a way to reduce the impact of bowel ischemia while improving mesenteric circulation and avoiding catastrophic aortic rupture?

Those examining the data within the German Registry for Acute Aortic Dissection Type A (GERAADA) suggest that perhaps this complex cohort would be best served with a frozen elephant trunk type of aortic repair.⁵ Although this technique may not address mesMPS secondary to superior mesenteric artery thrombosis or embolus (only 3 cases in the Michigan experience), a majority of dynamic downstream aortic obstruction would be relieved and the risk of aortic rupture eliminated. Others have put forth a pathway of primary laparotomy and superior mesenteric artery revascularization followed immediately by aortic repair.⁶ A second-look laparotomy at the end of the aortic reconstruction identified bowel in need of resection. An aggressive approach for sure, but their results (OM 20%) certainly were not worse than any of the other techniques previously described.

What is clear is that despite these heroic efforts, we still have a long way to go to reduce the overall mortality

associated with ATAAD and mesMPS. Irrespective of your surgical philosophy, the current spectrum of treatment algorithms leads to similar results. Earlier detection and prompt restoration of mesenteric blood flow are the only pathways that will lead to a significant improvement in outcome for these unfortunate few.

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