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## Commentary: Go with your gut: Evolving approaches in the treatment of type A dissection with visceral malperfusion

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Acute type A dissection (ATAD) and visceral malperfusion syndrome represents among the most challenging and lethal surgical conditions.<sup>1-5</sup> Preventza and colleagues<sup>6</sup> describe such a patient where the thoracic endovascular aortic repair (TEVAR)-provisional extension to induce complete attachment technique was successfully used as a first-line strategy before central aortic repair.

Three critical questions persist in the treatment of patients with ATAD and visceral malperfusion: (1) Which patients benefit from a visceral-first strategy?, (2) What is the optimal technique for resolution of visceral malperfusion? and, (3) What should be the timing of proximal aortic repair following resolution of visceral malperfusion?

### PATIENT SELECTION

Those with subclinical radiographic visceral malperfusion alone should be treated with immediate proximal aortic repair. These patients may benefit from arch intervention (eg, antegrade TEVAR, bare-metal arch stent, or hybrid arch stent-graft) to improve distal perfusion, although the optimal strategy remains unclear.<sup>7-12</sup> Patients with advanced visceral malperfusion syndrome with clinical or



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### CENTRAL MESSAGE

The TEVAR-PETTICOAT technique as a first-line approach before proximal aortic repair is a promising concept in the treatment of type A dissection with visceral malperfusion syndrome.

biochemical evidence of liver or bowel necrosis and concomitant hemodynamic stability (no aortic rupture or tamponade) are the subgroup of patients for whom a visceral-first strategy can be beneficial.

### ENDOVASCULAR REPERFUSION

Two main strategies exist to re-perfuse the visceral aortic branches, namely endovascular fenestration and a TEVAR-first technique. Endovascular fenestration involves percutaneous mechanical fenestration of the septum and often necessitates adjunctive procedures, including aortic stenting, branch vessel thrombolysis, or suction thromboembolectomy to address the static components of malperfusion.<sup>13,14</sup> Patients with dynamic malperfusion could be treated with a proximal TEVAR with or without distal bare metal stents to re-expand the true lumen across the visceral segment of the aorta.<sup>6,15,16</sup> Leshnowar and colleagues<sup>15</sup> reported 13 patients treated with a TEVAR-first approach in the setting of ATAD and visceral malperfusion syndrome, 2 of whom required distal extension of the covered stent with bare-metal stents to achieve resolution of malperfusion.

In our opinion, a TEVAR-first approach, with distal bare-metal stents if necessary (as in this report) is likely the most reproducible and accessible method of endovascular visceral reperfusion. If a component of static malperfusion exists, further branch vessel intervention may be necessary. Regardless of approach, careful assessment by invasive hemodynamic measurements or angiography must be

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performed to ensure visceral reperfusion. A proportion of patients with late presentation will die of organ ischemia despite successful endovascular reperfusion.

### TIMING OF SURGERY

In both the Michigan and Emory experiences, a proportion of patients (13% and 7.7%, respectively), died of aortic rupture while awaiting open aortic repair.<sup>14,15</sup> This mortality must be included when reporting the outcomes of a visceral-first strategy. Proximal aortic surgery should likely be undertaken as soon as metabolic homeostasis permits. Some patients will require a delay longer than 24 to 48 hours, including those with ongoing multiorgan failure/refractory shock, bowel necrosis, or acute respiratory distress syndrome.

### CONCLUSIONS

Treatment for patients with ATAD and mesenteric malperfusion syndrome must be individualized with consideration given to the full armamentarium of endovascular and open surgical techniques. The use of TEVAR with provisional extension as a first-line approach is a promising concept in the management of carefully selected patients presenting with this challenging condition.

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