Commentary: Extension of the Petticoat Junction into the abdominal aorta

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Disclosures: Authors have nothing to disclose with regard to commercial support.

Received for publication July 21, 2019; revisions received July 21, 2019; accepted for publication July 22, 2019.

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J Thorac Cardiovasc Surg 2019;158:1019-20

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2019.07.052>

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Central Message

Procedures to enhance aortic remodeling in the setting of an acute aortic dissection have been described. The authors have extended techniques in the chronic setting and include the abdominal aorta.

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The optimal approach to chronic residual aortic dissection with subsequent aneurysmal growth after repair of a proximal aortic dissection remains unclear and has resulted in the development of preemptive procedures to promote false lumen thrombosis and aortic remodeling, that is, the frozen elephant trunk. An approach to promote aortic remodeling in the descending aorta for isolated acute Stanford Type B dissections appeared favorable or noninferior in the Investigation of Stent Grafts in Patients With Type B Aortic Dissections (INSTEAD)¹ and Acute Dissection Stentgraft OR Best Medical Treatment (ADSORB)² trials, and early results of the Provisional Extension To Induce Complete Attachment (PETTICOAT) trial also suggested the benefit of a bare metal stent (BMS) in the distal thoracic aorta.³ On the basis of these findings, the combined, extended approach of covered stent grafts in the thoracic aorta and BMS in the abdominal aorta in the setting of an acute type A dissection has been proposed.⁴

Huang and colleagues⁵ present their experience with 62 patients with chronic type A or DeBakey type 1 dissections who had a thoracic endovascular aortic repair (TEVAR) alone or in combination with a BMS in the abdominal aorta. Approximately one-quarter of patients died or were lost to follow-up at 1 year, but the authors had a progressive improvement in outcomes as they gained experience. Their results were not entirely surprising, with remodeling of the thoracic aorta and expansion of the true lumen. The slow rate of thrombosis of the thoracic false lumen in the BMS group was likely due to the purposeful undersizing of the covered stent graft. The expansion of the true lumen of the abdominal portion in the BMS group was also to be expected. There was no significant difference (or appreciable change) in false lumen reduction between the BMS and non-BMS groups, reflecting the chronicity of the dissections and the resultant stiffness of the septum.

This study had a statistically significant increase in the true lumen diameter and volume, as well as false lumen

thrombosis in the abdominal aorta that continued at 12 months, in a unique subset of patients who had previously undergone repair of DeBakey type 1 aortic dissections who had residual dissections in their arch or descending thoracic aortas. This is in contrast to other studies looking at isolated Stanford type B aortic dissections that did not show a significant benefit in true lumen expansion and false lumen thrombosis over TEVAR alone at 12 months.⁶ Long-term follow-up will be necessary to determine the full benefits of the “Petticoat” procedure for patients with type 1 and DeBakey type 3 aortic dissections. The patients with residual patent false lumens may need additional adjunctive interventions to prevent further aneurysm formation. One advantage of the “Petticoat” procedure is to maintain options for visceral or renal canalization in the future when further intervention is indicated. Options for distal aortic or iliac stent grafting and false lumen embolization have been reported and remain options for patients with persistent or multiple distal entry tears.

The “Petticoat” procedure as described by Huang and colleagues⁵ gives an additional option for treatment of complicated residual DeBakey type 1 dissections. We would add a cautionary note; 7 of the patients treated carried the diagnosis of Marfan syndrome, generally considered a contraindication for TEVAR. The authors remark that one of the mechanisms for aortic remodeling after

TEVAR is the radial force propagation, something that one would like to avoid in patients with connective tissue disorders. Although the proximal landing zone was in a graft (ie, arch or frozen elephant trunk), the distal landing zone of the BMS is in native tissue. There did not appear to be any complications associated with this technique in this subgroup of patients, but at only 1 year, the jury is still out.

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