Commentary: New SPIDER graft spins a large web

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Central Message

This well-designed feasibility study nicely presents the results of the updated SPIDER graft for thoracoabdominal aortic aneurysm repair, with modification in implantation technique.

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In this issue of the *Journal*, Wipper and colleagues¹ have presented the results of a well-designed feasibility study evaluating the SPIDER graft as follow-up to their original study² from earlier this year in the *European Journal of Vascular and Endovascular Surgery*. The current study nicely presents the results of using an updated version of the SPIDER graft, along with a larger sample size, in their porcine model.² In addition, they report modifications in implantation technique, as well as tissue perfusion data, to support their findings. Wipper and colleagues¹ compare results of animals that received the new SPIDER graft with those of a control open aortic repair group as well as with those of another SPIDER group that underwent lumbar artery reimplantation.

Aside from death, neurologic and spinal cord injury remain the most devastating complications encountered during these procedures. Advances in thoracoabdominal aneurysm repair have been incremental, with adjuncts such as lumbar drainage, arterial reimplantation, and hybrid procedures with staged thoracic endovascular aortic repair and open abdominal repair leading to reduced spinal cord injury.³ The current SPIDER system integrates the staged repair into a single abdominal operation. The avoidance of a thoracotomy and extracorporeal circulatory support has the potential to reduce kidney and lung complications. The lack of time for spinal adaptation, however, may prove a crucial shortcoming that meticulous reimplantation may not be able to overcome.

In this study, the open aortic repair group was used for comparison with the SPIDER graft groups. One advantage of an open approach is the option to reimplant portions of the segmental spinal blood supply; in this study, however, the vessels were oversewn in the open repair group. This raises the question of whether Wipper and colleagues¹ provide a “fair” comparison between groups when assessing spinal perfusion. There might have been

less of a difference had the vessels been reimplanted in the open repair group. Furthermore, spinal drainage is commonly used to decrease the risk of injury during open and endovascular thoracoabdominal aneurysm repair. Hayatsu⁴ and colleagues have used spinal drainage in a porcine model previously; however, the study of Wipper and colleagues¹ omitted this widely used adjunct. Finally, it must be considered that the anatomy of the porcine spinal blood supply is markedly different from that of humans. The segmental thoracic and lumbar arteries are relatively small and often originate as a single branch from the aorta.⁵ It will be important to see these results borne out when translated to first in human studies.

This is an exciting time in translational research as we bridge the gap between open surgery and endovascular repairs. As technology catches up with the imagination of cardiac surgeons, there will be many options for less-invasive approaches to surgical treatment of thoracoabdominal aneurysms. The SPIDER graft represents an important incremental advance, and we congratulate Wipper and colleagues¹ on this work.

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