Attachment disorder in thoracoabdominal surgery

Steven L. Lansman, MD, PhD, and David Spielvogel, MD

From the Section of Cardiothoracic Surgery, Department of Surgery, Westchester Medical Center, Valhalla, NY. Disclosures: Authors have nothing to disclose with regard to commercial support.

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114W, Valhalla, NY 10595 (E-mail: Steven.Lansman@WMCHHealth.org).

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In psychology, interpersonal attachments may be too strong or not strong enough. In thoracoabdominal (TA) surgery, intercostal artery (ICA) reattachments perhaps help prevent paraplegia or may be unnecessary maneuvers that prolong operative time and represent a potential source for perioperative bleeding and late patch aneurysm formation.

Addressing this controversy, Dr Afifi's group¹ reports a meticulously conducted, 14-year study, based on 1096 descending and TA aneurysm repairs. Spinal cord ischemia occurred in 10%, immediately in 3% and delayed in 7%, with 47% of delayed paraplegia resolving by discharge. Intraoperative ICA treatment was documented as to whether they were not exposed, natively occluded, ligated, or reattached. A cumulative score was formulated on the basis of involved ICA treatments, which was correlated with motor evoked potential data and the occurrence of cord injury.

The key finding is that multivariable analysis demonstrated that the risk for paraplegia increased by 1.3 per T8-12 ICA artery ligated ($P < .041$). Although the central message concludes that reattachment of T8-12 ICAs is warranted whenever feasible, in this series ICA reattachment was performed in only 17.3%, 18.1%, and 15.6% of extent I, II, and III repairs, respectively. The authors reconfirm their earlier finding that spinal injury correlates with pump time, but document that ICA reattachment adds minimally to that time.

It remains an issue as to how to integrate these findings with Griep's² well-documented body of work in which 4600 ICA pairs were ligated from T3 to L5; despite no ICA reattachment, the spinal injury rate was only 1.2% so long as fewer than 8 pairs were ligated but increased to 15% if more pairs were ligated.³ This work gave rise to the theory that the number of ligated ICAs, rather than the level of ligated ICAs, engendered spinal injury and contributed to the development of the spinal collateral network model.²

Possibly, the difference between these 2 large experiences lies in different intraoperative ICA treatment. In Griep's technique, the segmental arteries were serially ligated before opening the aneurysm, preventing backbleeding or steal from the spinal cord, while gradually decreasing

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Central Message

Different intraoperative treatment of ICAs may explain different experiences with spinal injury in TA surgery between 2 large, experienced programs.

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segmental artery input and allowing the spinal collateral network to accommodate to each ligation.⁴ Of note, motor evoked potential loss was rare by this approach but occurred in 56% in the present series, suggesting that a significant ischemic event occurred in the majority of patients. Although 90% were reversed, perhaps the transient ischemic insult predisposed to spinal cord injury, and a more important aspect of altering operative tactics may involve intraoperative management of distal perfusion, hypothermia, and prevention of steal, rather than ICA attachment.

Although this careful report by a program distinguished for contributions minimizing spinal injury⁵ adds significantly to the debate regarding TA surgery, it does not settle the controversy regarding ICA reimplantation. Finally, the majority of patients risking TA rupture cannot tolerate open surgery, making endovascular treatment the future. But ICA reperfusion is moot in endovascular repairs, and thus focus needs to be maintained on methods of spinal cord protection that do not depend on segmental artery perfusion.

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