Letters to the Editor

Management of spinal cord perfusion pressure to minimize intermediate-delayed paraplegia: Critical role of central venous pressure

To the Editor:

I read with great interest the recent article by Etz and colleagues¹ detailing their extensive experience in thoracoabdominal aortic aneurysm repair (858 cases: 1990-2006). The authors have clearly demonstrated the significant relationship between relative hypotension (mean arterial pressure 80% of preoperative baseline) and the risk of perioperative spinal cord ischemia ($P = .027$). Furthermore, they also detected a significant association between an elevated postoperative central venous pressure and the risk of spinal cord ischemia ($P = .03$).

The following questions arise as a consequence of this fascinating study:

1. Should we define spinal cord perfusion pressure as follows: (mean arterial pressure – central venous pressure) – cerebrospinal fluid pressure?

On the basis of the data presented by the authors and our current understanding of spinal cord physiology, this definition makes sense. Traditionally, central venous pressure has been omitted, because it has generally not been considered clinically significant in this setting.

2. If this definition is acceptable, does it suggest a more rational approach to the optimization of spinal cord perfusion pressure by manipulation of each parameter?

3. What central venous pressure would the authors suggest as a goal during corrective management for intermediate-delayed paraplegia?

4. What pharmacologic management would the authors suggest or consider optimal to increase mean arterial pressure and lower central venous pressure?

I congratulate the authors again on their important contribution. I look forward to their comments about this aspect of paraplegia management after thoracoabdominal aortic aneurysm repair.

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Reference

1. Etz CD, Luehr M, Kari FA, Bodian CA, Smego D, Plestis KA, et al. Paraplegia after extensive thoracoabdominal aortic aneurysm repair: does critical spinal cord ischemia occur postoperatively? *J Thorac Cardiovasc Surg.* 2008;135:324-30.

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Reply to the Editor:

We thank Dr Augoustides for his interest and questions.

It seems to us indisputable that ADEQUATE spinal cord perfusion during the first 24 hours postoperatively is critical for the prevention of intermediate delayed paraplegia after thoracic and thoracoabdominal aortic aneurysm repair. Our study made the relatively new observation that a normal blood pressure, if below a patient's preoperative level, can be a risk factor for intermediate delayed paraplegia. This buttresses the argument, which has been made for some time, that higher-than-normal arterial pressures may be necessary for adequate perfusion in the immediate postoperative period for patients after resection of descending thoracic and thoracoabdominal aneurysms to prevent paraplegia because antecedent pressure in many of these patients has been higher than normal. The current observation—linking the required pressure to the patient's presenting blood pressure—now suggests that target arterial pressures during the early postoperative period should be individualized.

Similarly, it has been known for some time that cerebrospinal fluid (CSF) pressure is an important component of spinal cord perfusion pressure (SCPP), and that CSF drainage helps to prevent spinal cord injury. What is relatively new is the

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