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Commentary: Transoesophageal stimulation for spinal chord monitoring: Catchy but still experimental!

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Yamanaka and colleagues¹ present a bipolar transesophageal thoracic spinal cord stimulation method that elicits motor-evoked potentials without direct cervical alpha motor neuron stimulation.

Among the earliest and most important studies on the preservation of a normal spinal cord function during surgery on the descending and/or thoracoabdominal aorta came out of Japan as early as 1960.² Later, Griep's Collateral Network Concept makes an important contribution to our understanding of spinal cord ischemia.³ As a matter of fact, the authors have already published on that topic and the main new aspect of the present work is that the stimulation may be applied through a transesophageal approach. Although the authors demonstrated that this type of approach may be safe in a canine experimental setting, some concerns subsist.

A simpler but reproducible method to monitor spinal cord integrity is welcome for the whole operative team (ie, anaesthesiologists, cardiac surgeons, and perfusionists) dealing with open surgery and/or thoracic endovascular graft in the most exposed part of the thoracic aorta for spinal cord ischemia.

In the experimental setting described here, the transesophageal electrodes are placed through fluoroscopy very precisely at the level of predefined vertebral bodies. The practicability of this method has been demonstrated in

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Bipolar transesophageal spinal cord stimulation may represent a technical advance to optimize monitoring of spinal cord function, but the advantages have yet to be demonstrated in humans.

this experimental work, but in clinical settings a substantial number of patients may be monitored with transesophageal echocardiography as well to continuously assess left ventricle and right ventricle heart function and the filling of the heart; this is of particular importance during support with partial cardiopulmonary bypass.

A potential caveat: The risk of dislocation of the transesophageal electrode may be high in cases of significant aortic kinking and lateral displacement of the esophagus. This potential difficulty may have been underestimated in the present canine experiment because the anatomy of the healthy animals was most probably straight.

The main advantages reported by the authors are that this method needs less stimulation (fewer volts) than a transcranial stimulation and that changes may be observed earlier. Although the first advantage seems not really important to my mind and the second one seems theoretically interesting, but in any case, the surgical team needs time to decide what to do in case of relevant changes when working on the thoracoabdominal aorta. The slightly quicker recovery of the potentials compared with what has been observed using transcranial stimulation is a rather discrete improvement.

The authors have to be congratulated for the perseverance with their work, but the routine clinical application has yet to be established. Among the major limitations is probably the potential interactions with the transesophageal electrocardiogram probe, which is used in the large majority of patients undergoing major thoracic aortic surgery. Another

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drawback may be the repetitive repositioning of the electrodes during the operation.

Finally, a last concern remains open because delayed paraplegia and paraparesis that occurs after anesthesia may appear in up to 30% to 50% of all cases. Because transesophageal stimulation is most probably not an option in awake patients, additional work and recommendation are needed on the role of prolonged monitoring in light of the increasing trend of delayed spinal cord ischemia.

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