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Is the Use of Intraoperative Neuromonitoring Justified During Lumbar Anterior Approach Surgery?

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To the Editor: I write to share a few concerns regarding the article titled “Is the Use of Intraoperative Neuromonitoring Justified During Lumbar Anterior Approach Surgery?”¹ in the April 2024 publication of the *International Journal of Spine Surgery*.

The authors present a multisite retrospective analysis of the effectiveness of intraoperative neuromonitoring (IONM) in 359 consecutive anterior approach total disc replacement and/or anterior lumbar interbody fusion (ALIF) surgeries.¹ Of these 359 surgeries, 3 cases with “aberrant” IONM results are presented, which the authors categorize as 1 false positive and 2 false negatives. Based upon these results and a literature review, the authors conclude that IONM does not provide any benefit for lumbar anterior approach surgery to treat symptomatic disc degeneration.¹

My concerns are that there is insufficient information on the IONM alerts to support their categorization, and somatosensory evoked potentials (SSEPs) cannot reliably detect a motor injury.

In the case categorized as a false positive, the authors describe the IONM alert as “changes in the IONM of the left lower extremity” but do not clarify whether the change was intermittent or sustained, how much the left SSEP changed compared to baseline, and whether it recovered.¹ The most likely reason for attenuation of the left lower extremity SSEP during an ALIF is leg ischemia due to retraction of the iliac vessels.^{2–5} In most cases when this occurs, the SSEPs recover when the retractor is removed. We cannot judge if transitory leg ischemia was the cause of SSEP changes in this case, as no detailed information is provided.

The second and third cases are categorized as false negatives because the patients experienced foot drop postoperatively, but there were no changes in the SSEPs or electromyography. However, SSEPs do not monitor motor function, and neither SSEPs nor EMG have

been shown to detect distraction neuropraxia motor injuries during ALIFs. SSEPs can only detect injury to the sensory pathway, serve as a surrogate for motor function, and may not detect a sensory deficit in one spinal nerve due to overlapping levels of innervation.⁶ Additionally, EMG is not reliable when neuromuscular blockade is used during ALIF surgery; the methods do not clarify whether neuromuscular blockade was utilized.

Not detecting a spinal nerve motor distraction injury while utilizing IONM modalities that cannot detect a spinal nerve motor distraction injury is not a false negative. The correct modality to detect spinal nerve distraction motor injuries is motor evoked potentials (MEPs). Currently, transcranial MEPs (which require a total intravenous anesthesia anesthetic regimen and a bite block) and transabdominal MEPs are the only options.^{7,8}

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