



Case Report

Severe hypotension with loss of motor evoked potentials during cervical surgery prompting immediate cardiovascular resuscitation

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ABSTRACT

Background: Intraoperative neuromonitoring (IONM) is a well-established adjunct to spinal surgery to ensure safety of the neural elements. IONM has extremely high sensitivity and specificity for impending neurologic damage. In very rare instances, hypoperfusion of the cord may lead to a loss of IONM modalities that may be reversed if blood pressure issues responsible for the drop out of potentials are immediately addressed.

Case Description: The authors describe a case in which IONM documented hypoperfusion of the cord intraoperatively due to hypotension. Recognition of this problem and reversal of the hypotension resulted in normalization of postoperative function.

Conclusion: The use of IONM allowed for quick recognition of an impending neurological insult during spinal deformity surgery. Prompt response to signaling changes allowed for the correction of hypotension and favorable neurologic outcome.

Keywords: Hypotension, Multimodal neuromonitoring, Neurosurgery, Spinal deformity surgery, Spine

INTRODUCTION

Intraoperative neuromonitoring (IONM) is a well-established adjunct to spinal surgery.^[2] When combined with clinical analysis, IONM has sensitivity and specificity for an impending neurologic event of nearly 100%.^[4,7,9] Here, we present a clinical case demonstrating the safety value of such real-time data, preventing potentially catastrophic neurologic injury secondary to hypotension/cardiovascular collapse.

CASE REPORT

An elderly female presented with a trauma-induced, unstable Type 2 odontoid fracture. The patient on presentation was found to have a traumatic aortic dissection emergently treated with endovascular stenting. Next, she underwent a posterior C1-C2 instrumented fusion. Manual reduction of the fracture with Mayfield pinning was performed prior to incision. The

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C1-C2 fusion was performed with C1 lateral-mass and C2 pars screws. The fusion was performed without significant changes on electromyography, somatosensory evoked potential, and transcranial motor evoked potential (tcMEP) monitoring.

Post instrumentation IONM changes

Post-instrumentation, during decortication for bone grafting and fusion, a routine tcMEP showed a complete loss of right lower extremity MEP. An immediate check of the blood pressure was performed; it could not be obtained. The repeat tcMEP now showed loss of bilateral lower extremity signals. A repeat check of the blood pressure, again, showed no data. At this point, the lack of MEP was attributed to hypoperfusion of the Artery of Adamkiewicz secondary to global hypoperfusion. Immediate resuscitation was initiated with vasopressors and a repeat blood pressure increased to 60 mmHg systolic/20 mmHg diastolic. The wound was emergently closed and the patient was flipped supine. A cardiac code was called and the blood pressure returned to normal, along with bilateral lower extremity tcMEP. The patient was intact on the immediate post-operative examination. The etiology of the patient's blood pressure loss, responsible for the drop-out of MEP, was never clear.

DISCUSSION

Neuromonitoring signal changes may commonly occur (28%) during deformity surgery.^[1,3,6,8] With immediate recognition of IONM changes, and appropriate resuscitative efforts, the overall rate of new neurological deficits is low.^[3,5,10,11]

Here, the patient's neurologic insult occurred due to global hypoperfusion, which lead to transient ischemia of the cord. The etiology of the hypoperfusion in this case remains unclear, as the patient did not exhibit electrocardiogram changes during or after the case.

In this case, the most critical maneuver was recognition of MEP changes and the total loss of perfusion (loss of blood pressure), instituting vasopressors, closing, turning the patient supine, and providing cardiac resuscitation.

CONCLUSION

The use of IONM during spinal deformity surgery allowed for prompt recognition of loss of MEP and blood pressure allowing for immediate cardiac resuscitation and reversal of the impending neurological injury.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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