

Anesthetic management of scoliosis surgery in an adolescent with undiagnosed subclinical distal neuropathy interfering with neurophysiologic monitoring and neuromuscular blockade.

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Introduction: Scoliosis surgery is very common in the practice of a pediatric anesthesiologist. The goals of anesthesia are to provide hemodynamic stability while interfering as little as possible with neurophysiologic monitoring. We report a case of an undetected sub clinical distal neuropathy in a scoliosis patient, which interfered with neurophysiologic monitoring and neuromuscular blockage assessment.

Case report: A 14-year old boy with juvenile onset idiopathic scoliosis, without any known neurological problems, presented for posterior spinal fusion. Induction of anesthesia was achieved with fentanyl, propofol and rocuronium. Anesthetic maintenance was with infusions of propofol and remifentanyl and low dose isoflurane. There were no apparent anesthetic complications. During surgical exposure, neurophysiologists notified the surgeon that no somatosensory evoked potentials could be measured. While trying to assess motor evoked potential, it became apparent that there was also unusually prolonged muscle relaxation after an intubating dose of rocuronium. No train-of-four or tetanus could be obtained. Wake up test could not be performed due to persistent paralysis. The case was aborted prior to any instrumentation. The patient was admitted to PICU, where sedation was turned off and he began to shiver despite the absence of a train-of-four response. Neuromuscular blockade was reversed and he was extubated successfully when fully awake. Extensive medical and neurological workup was undertaken. While a diagnosis could not yet be determined, it appeared that the patient suffered from a severe peripheral demyelating process. He returned to the operating room eight days later for completion of T2-L4 posterior spinal instrumentation with a sural nerve and gastrocnemius biopsy. Anesthetic management was modified to suit this new situation, as a wake-up test was now thought likely during surgery in the absence of reliable neurophysiological monitoring. Muscle relaxants were eliminated. Induction was with lidocaine, propofol and fentanyl. Infusions of remifentanyl and midazolam with low dose isoflurane were used for maintenance. Baseline TOF assessments of ulnar, posterior tibial and facial nerves were obtained after induction and were abnormal. SEPS could not be obtained and only using extra long sweep times we could monitor MEP's. They were obtained with unusually delayed response, but were very well formed and remained unchanged during surgery. A wake-up test was not necessary. The procedure was completed without complications and the patient was extubated in the OR. Recovery was uneventful and he did not develop any new neurological deficits. Diagnosis of severe chronic distal neuropathy was made and confirmed by nerve and muscle biopsy.

Discussion: This case report demonstrates a potential failure of neurophysiologic monitoring during scoliosis surgery. It demonstrates how peripheral neuropathy can complicate the operative course when neurophysiological monitoring is essential to surgery. Preoperative neurophysiologic assessment would have uncovered this pathology had it been performed. TOF assessment prior to paralysis proved to be very useful and could have also been helpful if performed prior to muscle relaxant administration. Failure of MEP and SSEP monitoring can be partially mitigated by performance of a wake up test. Anesthesiologist caring for the scoliosis patient should be familiar with this procedure.

References:

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