

Spinal Anesthesia for Cesarean Section in a Patient with a Spinal Cord Stimulator

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Introduction

In this case, we illustrate successful spinal anesthesia for cesarean delivery in a parturient with an indwelling spinal cord stimulator placed secondary to her history of reflex sympathetic dystrophy (RSD). To our knowledge, there are no case reports demonstrating this. In the future, other anesthesia providers will be challenged by similar case scenarios as the use of intrathecal devices for management of chronic pain syndromes continues to grow.

Case Presentation

A 40-year-old gravida 1 presented for urgent cesarean section secondary to severe preeclampsia. The patient reported a 19-year-history of reflex sympathetic dystrophy (RSD) involving her left lower extremity. Her past RSD treatment course included oral medications, nerve injections, transcutaneous electrical nerve stimulation (TENS), and lumbar spinal cord stimulator placement in 1990 and revision in 2003. This device was known to be nonfunctional; her current RSD treatment regimen included only oral medications (gabapentin, cyclobenzaprine, and acetaminophen with codeine). Prior to presentation for labor and delivery, the patient presented to our facility requesting removal of the spinal cord stimulator. However, it had not yet been removed prior to presentation for cesarean delivery. Her medical history also included bipolar disorder, right ductal carcinoma of the breast status post lumpectomy, lymph node dissection, chemotherapy, and radiation.

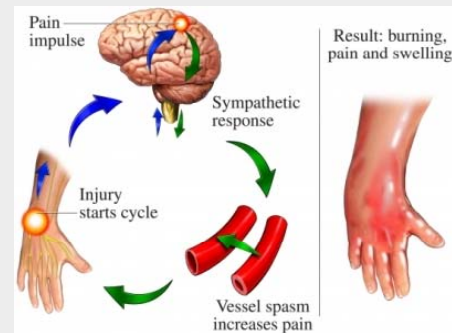
Physical examination revealed a height and weight of 66 inches and 106 kilograms, respectively. Her baseline vital signs were: blood pressure 172/90, heart rate 94, oxygen saturation 100%, and respiratory rate 18. Airway examination demonstrated a Mallampati IV classification with marginal mouth opening. Thyromental and hyomental distances were appropriate. Examination of her back revealed surgical scarring at ~L2/L3 level. Hematology and thromboelastography studies were within normal limits. Computed tomography of the spine performed one month earlier reported the presence of a pulse generator in the right gluteal soft tissues with its lead terminating in subcutaneous tissue ~1cm posterior to the L2 spinous process. There was no evidence of a lead or foreign body in the spinal canal.

In preparation for the procedure, large-bore peripheral intravenous access and invasive arterial monitoring was established on the patient's left upper extremity. Aspiration prophylaxis, antibiotics, and an appropriate preload were administered. In sterile fashion, a spinal was performed atraumatically using a Pencan 25gauge needle. The following were deposited in the intrathecal space: hyperbaric bupivacaine 10.5 mg, fentanyl 10mcg, duramorph 0.2 mg, and epinephrine 100mcg. No parasthesias were elicited. The patient was placed supine with left uterine displacement and 100% oxygen via facemask. A level of T3 was obtained. The cesarean delivery proceeded uneventfully. A healthy male infant was born (Apgars 91 and 95), and the patient tolerated the procedure very well.

Discussion

RSD is used to describe a wide group of conditions associated with burning pain in an extremity; dystrophic changes in skin, hair, nails, and joints; allodynia; and signs of autonomic dysfunction (see figure below that illustrates RSD). Treatment goals of this complex disorder include pain control and mobilization of the affected limb. Several modalities are often employed in the treatment of this chronic pain syndrome. Known therapies are individualized and usually include systemic agents (sympathetic blockers, calcium channel blockers, tricyclic antidepressants, anticonvulsants, and steroids), TENS, nerve blocks, physical therapy, psychosocial counseling, and surgical interventions (ie spinal cord stimulation).

Several factors were contributory in our decision to perform spinal anesthesia in this patient. Interviews with the patient and subsequent evaluation revealed the patient's spinal cord stimulator was offering no relief of her pain and therefore determined to be nonfunctional. This finding is consistent with a recent study that has demonstrated that the pain-alleviating effect of spinal cord stimulators in chronic RSD diminishes with time³. Additionally, the location of the patient's spinal cord stimulator was confirmed via CT scan. We also strongly considered findings on physical exam that were suggestive of a potentially difficult airway. Specifically, the patient was an obese parturient with visible edema. She demonstrated only marginal oral opening and a Mallampati IV classification. General anesthesia was not the first choice in this patient for several reasons. Her pregnant state and obesity greatly predisposed her to increased aspiration risk as well as potential difficulties with establishment and maintenance of adequate oxygenation and ventilation. All factors considered, the anesthetic plan included performance of spinal anesthesia in this patient was executed uneventfully.



The figure above illustrates the mechanisms involved in the RSD syndrome (2008 Nucleus Medical Art, Inc).

Conclusion

The use of spinal cord stimulators for treatment of chronic pain syndromes such as RSD is steadily increasing. Anesthesia providers should be familiar with considerations for providing safe neuraxial anesthesia in this growing patient population. The decision to perform neuraxial anesthesia after back surgery with or without instrumentation is not straightforward. There are no absolute statements to be made regarding the optimal anesthetic management. Each patient's case should be evaluated individually. All care providers should be in communication early with each other and the patient to ensure the most appropriate decision and the best patient outcome.

References

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The figure above illustrates an indwelling spinal cord stimulator similar to the device present in the patient of interest in this case report².