

Inadequate Epidural Analgesia in a Parturient with Scoliosis Treated using the 60° Head-up Position and Additional Administration of Epidural Saline with a Local Anesthetic: A Case Report

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Introduction

Scoliosis is defined as lateral curvature of the spine. This condition is found in 2% of the population worldwide with a two-fold higher prevalence in women than in men [1]. The challenges faced by anesthesiologists in providing neuraxial analgesia for parturients with scoliosis are inability to identify the epidural space, multiple attempts before catheter insertion, long insertion time, patchy or inadequate analgesia, high likelihood of dural puncture, and low potential for the successful treatment of post-dural puncture headache. Here, we present a parturient with scoliosis, which had an unsatisfactory block with epidural analgesia that was successfully managed using the 60° head-up position and additional administration of epidural saline with a local anesthetic.

Case Report

A 32-year-old nulliparous woman (weight, 62 kg) was admitted at 39 weeks and 5 days of gestation following spontaneous rupture of membranes. She requested for labor analgesia. After reviewing her medical records, scoliosis since adolescence without surgical correction was noted. We assessed the location, nature, and extent of vertebral involvement by reviewing her radiographic image (Figure 1). There was no coexisting cardiopulmonary or musculoskeletal disease.

Following aseptic preparation and injection of 2% lidocaine 80 mg (4 mL) subcutaneously, an 18-gauge Tuohy needle (Portex™ Epidural Minipack System 1, Smiths Medical, Hythe, Kent, UK) was inserted with the patient in the left lateral position. Several attempts were made to enter the epidural space at L3-4 or L2-3 using either the median or para-median approach; however, these approaches proved technically difficult owing to deviation of the midline of the spinous process by palpation. Moreover, accidental dural puncture at the intervertebral space of L3-4 with clear cerebrospinal fluid flow from the Tuohy needle was noted during epidural placement. Finally, a 22-gauge epidural catheter with three lateral eyes was successfully inserted into the L1-2 epidural space using the loss-of-resistance-to-air technique. The catheter was placed twelve centimeters in depth from skin.

Following injection of 2% lidocaine 40 mg (2 mL) without epinephrine through the epidural catheter as a test dose, she was returned to the supine position. Labor epidural analgesia was initiated with an initial loading dose of 8 mL of a combination of ropivacaine (1.6 mg/mL [0.16%]) and fentanyl (1 mcg/mL), followed by a continuous or background infusion rate of 2 mL/hour and a demand dose of 6 mL. The lockout interval was 15 minutes. There were no significant alterations in her vital signs subsequently.



Figure 1: Posterior-anterior radiograph of the chest and thoracolumbar spine.

Thirty minutes after epidural infusion, however, she complained of mild chest tightness and paresthesia accompanied with dyspnea, dizziness, and nausea. She could still feel labor pain. We considered an epidural inadequate for labor pain with suspected symptomatic high block or extension of the cephalad sensory block into the mid-thoracic segments rather than the lumbar segments. This condition might be probably due to relatively high epidural insertion site and her scoliosis-related anatomical changes. We did some efforts and tried to improve the analgesic efficacy by withdrawing the epidural catheter for two centimeters first. However, her labor pain and chest discomfort did not improve. We then injected 20 mL of 0.9% saline through the epidural catheter and placed her in the 60° head-up position under the impression of relatively high epidural block. Her discomfort gradually resolved with satisfactory analgesia in minutes. A healthy baby was then born through normal spontaneous delivery 7 hours after the initiation of epidural analgesia. There were no maternal or fetal complications noted.

Discussion

Epidural analgesia is a popular method of pain relief for labor. To facilitate neuraxial placement in uncorrected scoliosis patients, Ko and Leffert [2] recommended that the needle be oriented toward the convexity of the curve where the interlaminar spaces are generally large. Radiographic images in patients with scoliosis may facilitate understanding their vertebral anomalies and allowing regional techniques to be successfully performed. McLeod et al. [3] reported that ultrasonography might help to estimate the depth and location of the epidural space and facilitate insertion of epidural catheters in patients with scoliosis.

However, not all epidurals function effectively throughout labor. Troubleshooting and management options for failed blocks or suboptimal labor epidural analgesia are extremely important. Epidural catheter manipulation is a potential management option. Campbell and Tran [4] reported that withdrawing the epidural catheter a few centimeters reduces failed epidural blocks which was not effective in our case. Placement of another epidural catheter at the level of the unblocked dermatome [5] or replacing the epidural catheter might help too. However, there are still problems such as difficult technique due to anatomic anomaly, possible local anesthetic toxicity, and prolonged time to establish a block, and subsequent block reliability and quality with the epidural [6]. In the present case, we tried withdrawing the epidural catheter for several centimeters but there was still patchy block at the level of the unblocked dermatomes. We thereafter administered a large volume of epidural saline along with local anesthetic at a low concentration and placed the patient in the 60°

head-up position to overcome the problem. The simple maneuver was effective and proved to be no other complications.

Conclusion

In our case report, we demonstrated that a large volume of a local anesthetic at a low concentration and then the 60° head-up position are effective for excessive cephalad or poor caudal spread of a local anesthetic in lumbar epidural block in a parturient with scoliosis.

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