

Is It Safe to Perform an Autologous Epidural Blood Patch on Patients with Underlying Spinal Stenosis or Lumbar Disc Disease? Case Report and Literature Review

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Abstract

The most common spinal pathology seen in the obstetric population is lumbar disc herniation. There is currently no literature documenting the safety of performing an epidural blood patch on obstetric patients with underlying spinal pathology. We present a case of a patient with known severe lumbar spinal stenosis with compressive radiculopathy who received a successful epidural blood patch without worsening her underlying neurologic symptoms. Epidural blood patches can be safely performed in this patient population. However, the anesthesiologist should be aware of the risk of potentially worsening preexisting neurological deficits. Thus, we advise caution prior to placing an epidural blood patch on these patients. The risks and benefits of the procedure should be carefully weighed and considered. It is important to have a thorough discussion with the patient regarding the risks of an epidural blood patch prior to performing the procedure.

Keywords

Epidural Blood Patch, Post-Dural Puncture Headache, Spinal Stenosis, Disc Herniation, Obstetrics

1. Introduction

Post-dural puncture headache (PDPH) is a common sequela seen from an unintended dural puncture [1]. It is believed to be secondary to low intracranial cerebrospinal fluid volume with subsequent traction on pain-sensitive structures in the cranium [2]. PDPH is described as a dull, throbbing headache that is posi-

tional—that is, it worsens within minutes of sitting or standing and improves within minutes of the patient lying down [3]. The epidural blood patch is considered the gold standard treatment for PDPH [4]. There is currently no literature as to whether epidural blood patches can be performed safely on patients with prior lumbar stenosis or disc herniation. We present a case of a patient with a history of symptomatic lumbar spinal stenosis who had a successful epidural blood patch performed without any worsening of her underlying radicular neuropathy. To the best of our knowledge, the topic of performing epidural blood patches in patients with prior spinal pathology is scarce in current medical literature.

2. Case Presentation

A 34-year-old G3P1011 presented to the University Hospital's obstetrics suite for induction of labor. Her current pregnancy had been complicated by migraines, chronic hypertension, non-insulin-dependent diabetes mellitus (NIDDM), and morbid obesity (BMI 52). In addition, the patient had a history of degenerative disk disease at the L4-L5 level and severe spinal stenosis at the level of L5-S1 with subsequent chronic lower back pain and compressive radiculopathy (Figure 1 and Figure 2). She described her pain as mostly in her lower back with

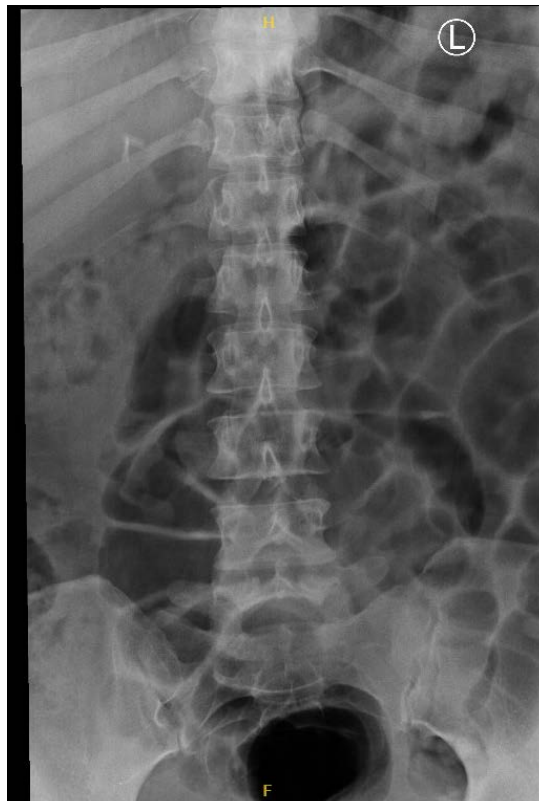


Figure 1. AP view of lumbar spine. There is disc narrowing at the L4-L5 level. Anterolisthesis of L5 on S1 noted. Severe narrowing of the spinal canal at the L5-S1 level appreciated.



Figure 2. Lateral view of the lumbar spine. There is disc narrowing at the L4-L5 level. Anterolisthesis of L5 on S1 noted. Severe narrowing of the spinal canal at the L5-S1 level appreciated.

occasional sharp, “shooting” pain radiating down her posterior left thigh and lower leg. She reported that her pain was not associated with muscle weakness and was not exacerbated during her current pregnancy. She was taking Gabapentin 800 mg three times a day as well as PRN NSAIDs with moderate control of her back pain. She had an outpatient appointment prior to her pregnancy for an MRI of her lumbar spine. However, the patient did not follow up with her appointment.

During her admission, the Obstetrics team consulted Anesthesia for placement of a labor epidural for pain control. A L3-L4 level was carefully selected. Placement of the epidural catheter at a lower level was avoided given the patient’s history of disc disease and spinal stenosis. However, the initial few attempts by the on-call anesthesia resident were unsuccessful due to difficulty identifying the midline of the patient’s back. The on-call anesthesia attending was then called for assistance in placing the epidural catheter. During the attending’s first attempt, the attending reported a questionable loss of resistance. A

CSF leak was noted after using the epidural needle stylet to clear tissue residue that had accumulated in the Tuohy needle. The decision was then made to place an intrathecal catheter. A 19-gauge catheter was inserted through the Tuohy needle for continuous intrathecal infusion for labor analgesia management. The needle was subsequently removed, and the catheter was secured in place. A continuous intrathecal catheter pump was set at 1 mL/hour with satisfactory labor analgesia. At no point during the procedure did the patient report worsening of her radicular pain.

The labor course lasted 14 hours. The epidural catheter was capped immediately after vaginal delivery and removed 2 hours later in accordance with our hospital's "no catheter in the recovery suite" policy.

The patient started complaining of headache and tension in the back of her neck 12 hours after spontaneous vaginal delivery. The pain was associated with positional changes—she stated that her headache worsened when she sat up in bed and improved when she laid down. She did not report any other neurological symptoms such as dizziness, blurry vision, tinnitus, or nausea and vomiting. She described her headache as frontal, persistent, and rated it as an 8 out of 10 on the VAS pain scale. The diagnosis of post-dural puncture headache (PDPH) was then made. The patient was recommended bed rest, no straining or heavy lifting, adequate hydration, and caffeine intake for the next 24 hours. However, the conservative measures did not improve her headache. The anesthesia team was then consulted by the Obstetrics service to evaluate the patient for possible placement of an epidural blood patch. The procedure was explained in detail to the patient as well as its risks and benefits. The patient consented for placement of an epidural blood patch. As part of the evaluation, a focused history and physical exam was performed. On physical exam, the patient did not have any focal weakness or sensory loss to her lower extremities. Her reflexes were intact. She denied any bowel or bladder incontinence. She described intermittent pain radiating from her lower back through her left posterior thigh down to the plantar aspect of her left foot. She reported that her underlying radicular pain had not worsened with initial placement of the epidural catheter and remained stable. Based on these findings, as well as a normal platelet count and coagulation parameters, the patient was deemed a candidate for an epidural blood patch.

Given the patient's BMI, her history of low back pain from disc disease and spinal stenosis, along with multiple epidural attempts at placing the catheter, the epidural blood patch procedure was done in the Obstetrics Unit operation room as opposed to performing it at bedside or in the labor recovery room for uncomplicated cases. The patient was accompanied by two Obstetric nurses to the operating room. Once in the room, the patient had standard ASA monitors applied and her vital signs were fully monitored during the length of the procedure. After fully examining the patient's back, we decided to perform the blood patch at the same level (L3-L4) that the original intrathecal catheter was located. A 3.5-inch (9 cm) epidural Tuohy needle was used, the epidural space was identi-

fied, and a 19 Gauge soft tip epidural catheter was threaded through the needle. 20 mL of the patient's own blood was obtained from a right forearm peripheral IV in a sterile fashion and was injected via the Tuohy epidural needle. The full 20 mL the patient's own blood was injected into the epidural space. The patient complained of "tensing" and "tightness" of her lower back but denied any radicular pain down her left leg. Patient reported an immediate improvement of headache after the blood was injected into her epidural space. She was then transferred to the post-anesthesia care unit (PACU) for observation and monitoring, where she remained for one hour. A post-procedure evaluation performed by the anesthesia resident demonstrated that the patient had complete relief of her headache and neck tension. She also reported that her lower back "tightness" she experienced during the procedure had resolved. Her left leg radicular pain had remained stable throughout the procedure and afterwards.

After the observation period, the patient was discharged home by the Obstetrics team.

She was instructed by the anesthesia team upon discharge to hydrate well, avoid straining or heavy lifting, and to drink caffeine. A follow-up call by the anesthesia team the following day demonstrated complete resolution of the patient's headache. She reported that her lower back pain and radiculopathy were still present but unchanged as from before her admission. Informed consent was then obtained from the patient over the phone to report and present her case.

3. Discussion

Although lumbar spinal stenosis and lumbar disc herniation is commonly encountered in the geriatric population, affecting approximately 47.2% of people between the ages of 60 and 69 [5], it is increasingly becoming recognized as a problem seen within the obstetric population as well. Lumbar disc herniation with radiculopathy is estimated to affect 1 out of 10,000 obstetric patients that complain of low back pain [6]. It is the most common spinal pathology seen during pregnancy [7]. The anesthesiologist should take this into consideration prior to performing neuraxial anesthesia, especially in patients with symptomatic spinal stenosis (*i.e.* radiculopathy), which is indicative of neural root compression. Whether patients with lumbar spinal pathology have a more difficult placement of neuraxial anesthesia and a higher incidence of accidental dural puncture has not been fully studied, although a prior retrospective review by Hebl *et al.* (2010) indicates that this is not the case [8].

Preexisting spinal stenosis with radiculopathy is not considered an absolute contraindication to placement of an EBP. However, many anesthesiologists would be hesitant to perform an EBP on a patient with a narrowed spinal canal because of potentially worsening underlying nerve root compression. Many mechanisms have been postulated for this potential risk after neuraxial anesthesia or EBP placement. However, the precise mechanism remains unclear. One of the postulated mechanisms relates to increased epidural pressure. Injection of

any fluid into the epidural space will increase epidural pressure. In patients with lumbar stenosis, where the epidural space compliance is low, the pressures in the epidural space can be transmitted to the subarachnoid space and cause the subarachnoid pressure to rise. In patients who already have compressed nerve roots, this increase in intrathecal pressure can lead to further compression and potential ischemia of the vascular and neural structures of the spinal canal [9]. A prior case report by Hooten *et al.* (2008) documents an instance of a patient with a history of congenital lumbar spinal stenosis developing acute back pain with radicular symptoms after an attempted epidural blood patch for PDPH. In this case, a similar mechanism was postulated for the patient's symptoms [10]. Regardless of the mechanism, patients with underlying spinal stenosis could potentially be at increased risk for further nerve compression with increased epidural pressure [8] [11] [12] [13]. Therefore, it is imperative to approach the patient with caution and assess the risks versus benefits prior to performing an EBP for a PDPH.

Although there is much literature addressing neurological sequela after neuraxial anesthesia in patients with underlying spinal pathology, the literature on neurologic complications after EBP in this population is limited. A large retrospective study conducted by Hebl *et al.* (2010) demonstrated that patients with underlying spinal stenosis or lumbar disc disease were at an increased risk of developing worsening neurological deficits as compared to the general population when receiving neuraxial anesthesia [8]. Another retrospective study conducted in Sweden from 1990 to 1999 also concluded that patients with preexisting spinal pathology that receive neuraxial anesthesia are also at higher risk for neurologic complications [11]. The second ASRA Practice Advisory on Neurologic Complications Associated with Regional Anesthesia and Pain Medicine released in 2015 recommended, as a Class II recommendation, to consider the risk-to-benefit ratio of performing neuraxial anesthesia on patients with known spinal stenosis. If these patients do receive neuraxial anesthesia, increased perioperative vigilance and monitoring for symptoms concerning for neural compromise should be implemented [12]. We believe that these results and recommendations could apply to performing an EBP on patients with known spinal stenosis based on the similar underlying pathophysiology (*i.e.* increasing epidural pressure on already compressed neural roots). However, more research needs to be conducted on the safety of performing EBP in the obstetric population with underlying spinal canal pathology such as spinal stenosis and spinal disc herniation.

4. Summary

In summary, we present the case of an obstetric patient with symptomatic spinal canal stenosis who had an epidural blood patch placed safely without worsening of her underlying radicular back pain. Based on existing literature on the neurologic sequelae of neuraxial anesthesia in patients with spinal stenosis and extra-

polating that data to the EBP procedure, we believe that a blood patch can be safely performed on patients with underlying spinal pathology. However, these patients could be at higher risk of worsening preexisting neurological deficits and thus caution should be had prior to placing a blood patch. It is imperative for the anesthesiologist to weigh the risks and benefits of the procedure and to have a thorough discussion with the patient specifically regarding neurologic complications during and after the placement of an epidural blood patch.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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