

Inadvertent Discogram During Epidural Steroid Injection: A Case Report

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The obligatory use of fluoroscopy for placement of epidural steroids is controversial. Proponents of the use of fluoroscopy cite studies that report up to 35% rates of inaccurate placement of epidural needles without the aid of fluoroscopic imaging. This case study

presents a situation in which a loss-of-resistance technique resulted in an inadvertent discogram.

Keywords: Discography, epidural steroid injection, interventional pain management.

Recently there has been debate over the necessity of fluoroscopic confirmation of placement of epidural steroids. Advocates of the use of fluoroscopy during epidural steroid injection (ESI) cite studies that report up to 35% of attempts fail to be in the epidural space.¹⁻³ What follows is a case report that shows that the loss-of-resistance technique can result in improper placement of the needle.

Case Summary

A 71-year-old woman was referred to the Department of Anesthesia and Pain Management in a rural critical access hospital for an epidural steroid injection (ESI). The patient's medical history included chronic low-back pain without radiculopathy. She described her back pain as a continuous, intense ache that she rated a 10 on a numeric rating scale from 0 to 10. She had 3 prior interlaminar ESIs that provided her with up to 4 months' relief. Her medical history also included hypertension, depression, hypothyroidism, noninsulin-dependent diabetes, sarcoidosis of the lung, and gout. Surgical history included a cervical laminectomy, sinus surgery, cholecystectomy, appendectomy, and hysterectomy. She was allergic to penicillin. Her medications included rosiglitazone and metformin, colchicine, lisinopril, venlafaxine, levothyroxine, glyburide, atorvastatin, trazodone, and conjugated estrogen. She also took oxycodone 5/325 mg, as needed, for pain.

The patient's magnetic resonance images revealed severe degenerative changes of her lumbar spine with moderate to severe compression of the thecal sac at the L3 to L4 vertebral interspace and L4 to L5 interspace. There was also moderate compression at the L2 to L3 interspace. At L5 to S1, there was a right-sided spondylitic change with severe facet joint arthritis that displaced the right S1 nerve posteriorly. The patient's condition had been diagnosed as spinal stenosis.

On physical examination, palpation was negative for pain over the midline lumbar spine or facet joints. Range of motion was normal at the hips, knees, and ankles, and muscle strength was normal and equal bilaterally in her

lower extremities. Straight leg raises were negative for pain bilaterally, limited only because of hamstring stiffness, and her reflexes were intact.

After discussing the procedure with and obtaining informed consent from the patient, she was taken to the postanesthetic care unit. The patient was positioned prone on the radiolucent pain table with a pillow under her pelvis to flex the lumbar spine. Fluoroscopic (OEC series 9800, General Electric Company, Milwaukee, Wisconsin) scout films were obtained to identify the L4 to L5 vertebral interspace. An indelible ink mark was then made on her skin at the proposed injection site. Her back was then prepared and draped in the usual sterile fashion with a 10% povidone-iodine solution. A 1% lidocaine skin wheal was raised over the L4 to L5 vertebral interspace and a 20-gauge Tuohy-Schliff epidural needle (B. Braun Medical, Inc, Bethlehem, Pennsylvania) was used for the ESI.

Anterior-posterior fluoroscopic guidance of the epidural needle was used in addition to a loss-of-resistance technique to identify epidural placement. On first evidence of loss of resistance, 1 mL of radiopaque contrast (Omnipaque 300, Amersham Health AS, Princeton, New Jersey) was injected through the epidural needle. The anterior-posterior view showed a flat, transverse spread of the contrast. The C-arm angle was changed to a lateral view that showed the tip of the epidural needle in the L4 to L5 disc with subsequent discogram (Figure). The needle was withdrawn under lateral fluoroscopic guidance until the needle tip was in the epidural space. This was confirmed with injection of another 1 mL of radiopaque contrast. At that point, after negative aspiration for blood and cerebral spinal fluid, 6 mg of betamethasone was injected with 2 mL of preservative-free lidocaine 1%, diluted to a final volume of 9 mL. The needle was removed intact and the patient tolerated the procedure well.

Postprocedure, the patient was escorted back to the outpatient surgery department where she denied any numbness or weakness in her legs. She indicated that she had a marked reduction in her pain and rated her post-

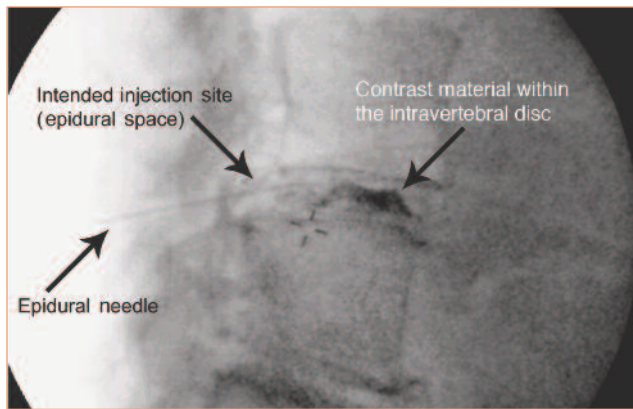


Figure. Discogram of the L4 to L5 Intervertebral Disc (lateral view)

This fluoroscopic image was taken on first loss of resistance during epidural steroid injection showing needle placement and radiopaque contrast in the intervertebral disc of L4 to L5.

procedural pain at a 3 on the 0 to 10 numeric rating scale. The outpatient surgery staff gave her discharge instructions and discharged her in satisfactory condition. On follow-up 1 week later, the patient reported excellent pain relief and denied getting a headache or any other complications from the procedure.

Discussion

Debate regarding the necessity of fluoroscopy for interventional pain management techniques still abounds despite clear evidence supporting its use.¹⁻⁷ Advocates of the use of fluoroscopy cite studies that claim a 15% to 35% inaccuracy rate in the placement of needles in the epidural space when fluoroscopy is not used.¹⁻³ Bartynski et al¹ found a 25.7% rate of inaccurate needle tip placement during lumbar ESI using a 20-gauge Tuohy needle. They argued that fluoroscopic imaging with an epidurogram is essential for confident identification of the lumbar epidural space. Liu et al⁴ reported that 8% of the time incorrect needle placement was noted when using a 20-gauge Tuohy needle with a loss-of-resistance technique and, therefore, concluded that fluoroscopy might be necessary to ensure correct needle tip positioning.⁴ Opponents of compulsory fluoroscopy argue that many facilities are not equipped with expensive fluoroscopy equipment and would be prohibited from offering the services. In addition, fluoroscopy exposes the staff and patients to radiation, with all of its inherent health risks.

The literature includes 3 reports of accidental disc entry. The first was a report on a complication from a transforaminal ESI.⁵ Finn and Case⁶ also reported inadvertent discogram during transforaminal ESI. These are cases in which there was proper needle placement, but because of disc bulging or herniation, the disc was located in the lateral epidural space in the path of needle entry.

The 1 report in the literature that presents disc entry from an interlaminar ESI claimed that lateral placement of the needle in a “safe triangle” consisting of dura medially, the spinal nerve root superiorly, and the pedicle inferiorly allowed the needle to pass without going through dura.⁷ This did not occur in the current case report, however. In this case, the needle was directed under fluoroscopic guidance in the midline of the spinal canal. The only possible relationship to the Huang and Kwa report⁷ would have been if the dural sac was displaced laterally within the spinal canal. This was not evident from her magnetic resonance image.

Disc puncture is not without risk. The most common complication is discitis secondary to infection. Planned discography includes preprocedural screening for infectious processes and antibiotics with strict adherence to sterile technique during the procedure. Intradiscal antibiotics are also advocated.⁸

The reason that loss of resistance in this case was obtained so late is unclear. The patient had 3 prior ESIs performed by the same practitioner, under fluoroscopy, at the same level, without complications. Given her age, it is not surprising that she did not develop a postdural puncture headache despite apparently having sustained 2 dural punctures (1 in the posterior dura and 1 in the anterior dura). In retrospect, she should have received, at a minimum, a dose of intravenous antibiotics before discharge.

This case study, while not the first to report inadvertent discogram during epidural steroid injection, reveals 1 instance in which relying on loss of resistance only would have resulted in inaccurate placement of the steroid. Many surgeons offer their patients ESIs before making a decision to operate. If this had been such a case, the patient may have gone on to surgery without a true trial of ESI's effectiveness.

Conclusion

Anesthesia providers must be aware of the potential for inaccurate placement of steroids without the aid of fluoroscopy in interventional pain management. This case study presents a situation that captured an errant needle placement with the use of fluoroscopy that would have otherwise gone unnoticed.

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