

Cauda Equina Syndrome After Epidural Steroid Injection with Multifocal Enhancement on MRI: A Case Report

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Abstract

Case Diagnosis

Cauda equina syndrome after epidural steroid injection

Case Description

A 77-year-old man presented with chronic right lower back pain, which radiated down his right leg and was accompanied by numbness and tingling. He had undergone a lumbar epidural steroid injection (ESI) a few years prior with significant benefit and was scheduled for another at this visit. Immediately following the procedure, the patient endorsed increased pressure and discomfort in his lower back. Vital signs remained stable throughout the process, and the patient left the surgical center, walking independently. Within one hour, the patient lost all strength in both legs, bowel and bladder function, and sensation from his hips down. He called 911 and was brought to the hospital. An MRI performed eleven hours after the procedure found epidural and neural foraminal enhancement at L5-S1 and multifocal enhancement of the cauda equina. The patient gradually returned to motor and sensory function over the next 24 hours.

Discussions

Various nonsurgical treatment options are available for radicular low-back pain, including ESIs, NSAIDs, and physical therapy. Cauda equina syndrome is a rare complication of epidural anesthesia which has been reported in the literature. This case is unique because the supportive findings of multifocal enhancement of the cauda equina were seen on MRI. Such MRI findings in patients caused by ESI are not currently prevalent in the literature.

Conclusions

This case illustrates the necessity of a clinical examination and the importance of continued attention for evaluating neurological pathologies following epidural injections. Fortunately, as seen with this patient, symptoms of cauda equina after an ESI typically improve within 24-48 hours. Counseling, careful observation, and proper medical care can provide the patient confidence in obtaining complete recovery within a short period.

Keywords: cauda equina syndrome, epidural steroid injection, multifocal enhancement

Objective/Introduction

Lumbosacral radiculopathy is one of the most common disorders that neurologists evaluate, with a prevalence of 3 % to 5 % spread evenly across men and women. [1] There are various nonsurgical treatment options for radicular low-back pain, including epidural steroid injection (ESI), nonsteroidal anti-inflammatory drugs, and physical therapy. [2] ESI is an elective procedure that is a commonly used treatment method for lumbosacral radiculopathy. Cauda equina

syndrome is a rare complication of epidural anesthesia which have been reported in the literature. [3] This case report describes cauda equina syndrome that is likely caused by ESI with dexamethasone and preservative-free normal saline with supportive MRI findings of multifocal enhancement of the cauda equina. Such MRI findings in cases caused by ESI have not been found in the literature in the past.

Clinical Features

A 77-year-old man presented to the clinic with more than twenty years of right more excellent than left lower back pain which radiated down the right leg and was accompanied by numbness and tingling.

The patient's pain would radiate down the right more than left buttock, was worse with sitting, and better with rest. He denied any bowel or bladder changes. He endorsed mild benefits from ibuprofen.

The patient had had a lumbar ESI a few years before this visit with significant benefit for a year, and the patient was scheduled for lumbar ESI with dexamethasone. The patient had an allergy to sulfa. He was a non-smoker, was not taking nonsteroidal anti-inflammatory

medications within a week of the procedure and was not taking antiplatelet or anticoagulant drugs. He had a past medical history of benign prostatic hypertrophy, gout, and hypertension.

Intervention and Outcome:

In the fluoroscopy room, the patient was under monitored anesthesia care. The patient was placed in the prone position, the skin was cleansed with Chlorhexidine, and three milliliters of 1 % lidocaine was injected subcutaneously at the L5-S1 level. A 17-gauge Touhy needle was inserted into the L5-S1 interspace under fluoroscopic guidance until the loss of resistance through the ligamentum flavum with normal saline occurred. No spontaneous return of fluid through the needle occurred. The epidural space was confirmed by the spread of 0.5 ml of Isovue contrast dye, and a 5 ml solution consisting of 20 mg of dexamethasone and 3 ml of 0.9 % preservative-free normal saline was slowly introduced into the epidural space.

Initially, the patient complained of lower back pressure and discomfort. Vital signs remained stable throughout the procedure, and the patient was taken to the recovery room and left the surgical center walking on his power. Within one hour, the patient lost all motor strength in both legs, lost bowel and bladder function, and lost sensation from the hips and distal down both legs such that he needed to call 911 to bring him to the hospital. MRI of the lumbar spine performed eleven hours after the procedure found epidural and neural foraminal enhancement at L5-S1 and multifocal enhancement of the cauda equina. The patient gradually returned to motor and sensory function over the next twenty-four hours. MRI of the lumbar spine performed eleven hours after the procedure resulted in the following findings and impressions:

Findings

There is contrast enhancement within the epidural space and neural foramina at L4-5 and L5-S1. There are focally enhancing nerve roots seen at the level of L3 and L4 and probably at the inferior margin of

Conclusion

The cauda equina is a bundle of nerves comprising the second through fifth lumbar, coccygeal, and sacral nerves. Generally, it starts at the L1-L2 disc space, where the spinal cord ends at the conus medullaris. Cauda equina innervates the pelvic organs and lower limbs. Cauda equina syndrome refers to symptoms that occur when these nerves are damaged. These symptoms include [1] pain, numbness, or tingling in the lower back and spreading down one or both legs, [2] weakness of legs and feet, [3] loss of bowel and bladder control and [4] loss of sexual sensation.[3,4] Transient cauda equina syndrome has been reported as a rare complication of ESI with local anesthetics³. One possible etiology of such injury is neurotoxicity caused by the possible injection of high doses of local anesthetics into the

L1. There are five lumbar vertebral segments. The lumbar spine shows anatomic alignment with preservation of vertebral body heights. The marrow signal is heterogeneous. Multilevel intervertebral disc space narrowing is most pronounced at L4-5, and. Disc desiccation is noted. The distal spinal cord is regular in motion and morphology, and the conus medullaris terminates at L1.

On axial images:

At L1-2, the posterior disc margin, thecal sac, neural foramina, and facet joints appear normal.

At L2-3, a diffuse disc bulge is noted. There is effacement of the ventral thecal sac. The thecal sac measures 10 mm in midline AP dimension. The neural foramina are maintained.

At L3-4, a mild disc bulge is noted. The thecal sac and neural foramina are maintained.

At L4-5, there is left greater than right facet hypertrophy and thickening of the ligamentum flavum. A disc bulge is noted, which is eccentric to the left. There is moderate left neural foraminal narrowing and mild right neural foraminal narrowing. Epidural and left neural foraminal enhancement is noted.

At L5-S1, bilateral facet disease is noted. A disc bulge is indicated, which is central to the left. There is moderate left neural foraminal narrowing and mild right neural foraminal narrowing.

There is epidural and foraminal enhancement.

Impression

Epidural and neural foraminal enhancement at L5-S1 and multifocal enhancement of the cauda equina, as described above.

Multilevel degenerative disease as above without central spinal stenosis.”

subarachnoid space.[5] This case is novel in that no local anesthetics were used, and MRI imaging shows multifocal enhancement of the cauda equina that helps confirm this clinical syndrome. As seen with our patient, such symptoms after an ESI improve within 24-48 hours. Counseling, careful observation, and proper medical care can provide the patient confidence in obtaining complete recovery within a short period. This case illustrates the necessity of a clinical examination and the importance of continued attention for evaluating neurological pathologies following epidural injections.

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Appendix: MRI demonstrating multifocal enhancement:



