The Sacral Hiatus Approach for Drainage of Anterior Lumbo-Sacral Epidural Abscesses

A Case Report and Technical Note

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Summary

Lumbosacral epidural abscesses are managed either conservatively with IV antibiotics or with open surgery, particularly in the presence of acute neurological symptoms. Their location makes it difficult for image-guided interventional approaches either for biopsy or evacuation. We report the sacral hiatus and canal as a corridor for image-guided minimally invasive abscess of lumbosacral epidural abscess for aspiration. A 56-year-old man presented to the emergency department complaining of six weeks of worsening low back pain. MRI of the patient's lumbosacral spine showed osteomyelitis involving his L5, S1 vertebrae, L5-S1 discitis, as well as an anterior epidural abscess extending from L4-5 disc space to the S2 vertebral level. Blood cultures grew out gram-positive cocci. For drainage, a 5-French micropuncture kit was utilized to access the hiatus. Under fluoroscopic guidance a microwire was then advanced along the sacral canal. An 18-gauge needle curved to approximate the contours of the sacral canal was then advanced over the guidewire. Once anatomic access was established 2 ml of thick purulent material was aspirated. The patient tolerated the procedure well, and no focal nerve root symptoms were noted following the procedure. Image-guided aspiration of lumbosacral epidural abscesses can thus be carried out in a safe and effective manner using a sacral hiatus approach.

Introduction

Spinal epidural abscesses are serious infections managed usually with prolonged intravenous antibiotics with or without surgical drain-

age. While successful percutaneous drainage has been reported at higher levels, the circumferential bony anatomy of the lumbosacral area makes percutaneous drainage here technically difficult. We report on the use of the sacral hiatus and sacral canal as a corridor to access these abscesses for image guided percutaneous drainage. Our case along with a previous report demonstrates the safety and feasibility of this corridor for the same ¹.

Case Report and Technical Note

A 56-year-old man presented to the emergency department at our institution complaining of progressing low back pain over six weeks with acute worsening. He denied any recent fever, chills, weakness, numbness or incontinence. He had a medical history of IV heroin abuse and hepatitis C. On physical examination he was in mild respiratory distress but was neurologically intact. He was afebrile at the time of evaluation. Pertinent laboratory findings included a white cell count of 11,000/mm³, a CRP>20, and an ESR of 90. MRI evaluation of his lumbar spine showed an anterior epidural abscess extending from his L4-5 disc space to L2 spanning a length of 4.8 cm, with significant spinal canal compromise (Figure 1 A-C). On subsequent work up the patient was found to have blood cultures growing MSSA, vegetations on his tricuspid valve and infective pulmonary emboli. Interventional radiology was consulted for needle aspiration of the lumbosacral abscess. After considering various approaches, a decision was made to perform needle aspiration through the sacral hiatus. The patient was placed prone on a fluoroscopy ta-

Figure 1 A) Sagittal T2W MRI. B) Sagittal T1W MRI with Gadolinium contrast demonstrating the rostrocaudal extent of the abscess centered on the L5-S1 disc and thecal compression. C) Axial T1W MRI with Gadolinium contrast at the level of the L5-S1 disc, showing anterior compression of the thecal sac by a contrast enhancing collection.

ble and a 5-French micropuncture kit was utilized to access the hiatus under fluoroscopic guidance. A microwire was then advanced along the sacral canal. An 18-gauge needle curved to approximate the contours of the sacral canal was then advanced over the guidewire (Figure 2 A-C). Once anatomic access was established 2 ml of thick purulent material was aspirated (Figure 3). The entire procedure was carried out with local anesthesia and conscious sedation. The patient tolerated the procedure well, and no focal nerve root symptoms were noted following the procedure and the patient

remained neurologically intact. Pus obtained from the procedure was sent to the laboratory for evaluation and grew out MSSA. The patient ultimately underwent open surgical drainage of the abscess to remove multiloculated collections and inflammatory phlegmon.

Discussion

Lumbosacral epidural abscesses cause significant morbidity and mortality and most often seen between the ages of 30 and 60 years²⁻⁶.

Figure 2 Intraprocedural lateral (A,B) and antero-posterior (C) projection fluoroscopic images showing the position of the needle in the sacral canal. A) The needle can be seen halfway in the sacral canal while obtaining access. B,C) The needle positioned within the abscess.

Figure 3 Figure showing pus aspirated within tubing (arrow).

Reihaus et al. in a meta-analysis of 915 cases found the most common risk factors to be diabetes mellitus, followed by trauma, intravenous drug abuse, and alcoholism⁶. The most common sources of infection were skin abscesses and furuncles, while epidural anesthesia contributed to 5.5% of these cases. The clinical symptomatology was progressive. 71% presented with back pain as an initial symptom and 66% had fever (first stage). The second stage is radicular irritation followed by a third stage of sensory-motor deficits and sphincter disturbance. Frank paralysis (stage 4) occurred in 34% of the patients. The most common causative agent is *Staphylococcus aureus*. MR imaging should be obtained emergently and displays the size, extent and anatomy of the abscess.

Treatment options depend on the clinical presentation. In the absence of neurological symptoms a prolonged course of intravenous antibiotics can be tried with serial neurological examinations and neuroimaging follow up. Surgical decompression and drainage are used when progressive neurological symptoms are present. Needle drainage has been traditionally used for obtaining an etiologic diagnosis, although in several reports it has been used as a primary form of decompression⁷⁻¹⁰. Siddiq et al. retrospectively studied 57 cases of spinal epidural abscess and concluded that intravenous antibiotics alone percutaneous needle drainage along with intravenous antibiotics

yielded at least comparable results to surgical drainage with antibiotics irrespective of patient age, comorbidities, comorbid illness, disease onset, and neurological function¹¹. This observation was however skewed by the fact that the operated patients tended to have more severe neurological dysfunction at presentation.

In this article we describe the feasibility of a sacral hiatal approach through the sacral canal for evacuation of lumbosacral epidural abscesses. This approach was originally described by Kostanian and Mathews and was carried out in a 51-year-old man at the same level using CT fluoroscopic guidance¹. In the reported case we used the same approach under X-ray fluoroscopic guidance for the same purpose. The anatomy surrounding the vertebral canal at this level severely restricts the ability to safely place a needle in anterior epidural abscesses without traversing the thecal sac. Traversing the thecal sac runs the risk of spreading infection into the CSF and causing meningitis and further complications. IR guided needle aspiration of these abscesses can be diagnostic, when an infectious agent is not readily cultured from blood, and therapeutic by mechanical decompression of neural structures as well as by removal of an infectious locus. In situations when the abscess is multiloculated or partially organized (phlegmon) an open surgical procedure may be required to physically remove the mass.

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