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# CASE REPORT

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## Subacute Spinal Epidural Abscess after Spinal Cord Stimulator Trial: A Diagnostic Challenge

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■ **Abstract:** Spinal epidural abscess is a rare, but potentially devastating infection located in the epidural space. The infrequency in which it is encountered, plus the non-specific signs and symptoms make it a formidable diagnostic challenge. We present this case patient with a subacute spinal epidural abscess that was diagnosed two months following a spinal cord stimulator (SCS) trial. The patient had no presenting signs or symptoms of an epidural abscess and the diagnosis was not made until after an attempted permanent SCS implantation.

### CASE REPORT

A 59-year-old woman with obesity, insulin-dependent type II diabetes mellitus, and obstructive sleep apnea was being treated for chronic back pain, lumbar radiculopathy, and lumbar post-laminectomy syndrome. Having failed conservative treatment she was considered for a spinal cord stimulator trial. During the SCS trial, strict aseptic technique was used. A prophylactic dose of intravenous Vancomycin 1 gram was started less than one hour before the trial was initiated. Two 14 gauge Coudé needles were used to access the epidural space at the T12-L1 interspace using the loss of resistance technique and intermittent projection of fluoroscopy. Then two percutaneous leads were inserted and advanced to the top of the T7

vertebral body bilaterally under live fluoroscopic guidance. Next, the leads were secured to the skin using mastisol, steri-strips, and sterile dressings to cover the entry sites. There were no breaks in sterility during the case, and the patient was transported to the post-anesthesia care unit (PACU) in stable condition with no apparent complications. A prescription for cephalexin 500mg twice daily was written for her before PACU discharge per our usual SCS trial protocol. It was not until one month later that we discovered that she failed to start her antibiotic regimen until the fifth day of the trial. There was significant pain relief from the SCS trial and she underwent an uneventful lead removal on postprocedure day 7. There was no abnormal erythema or discharge from the wound sites on the day the trial leads were pulled.

Three weeks after the leads were removed, the patient presented to the Emergency Department (ED) for severe back pain that radiated to her abdomen. In the ED, presentation vital signs were temperature 97.8°F, heart rate 90, blood pressure 111/57, and respiratory rate 18. A contrast computed tomography (CT) scan of the abdomen/pelvis was done in the ED and did not show any acute abnormalities. Physical exam showed no neurologic abnormalities. A clinical diagnosis of urinary tract infection was made after a positive urinalysis and a white blood cell (WBC) count of 15.6 (normal range 4.8-10.8). She was discharged home on oral trimethoprim-sulfamethoxazole and

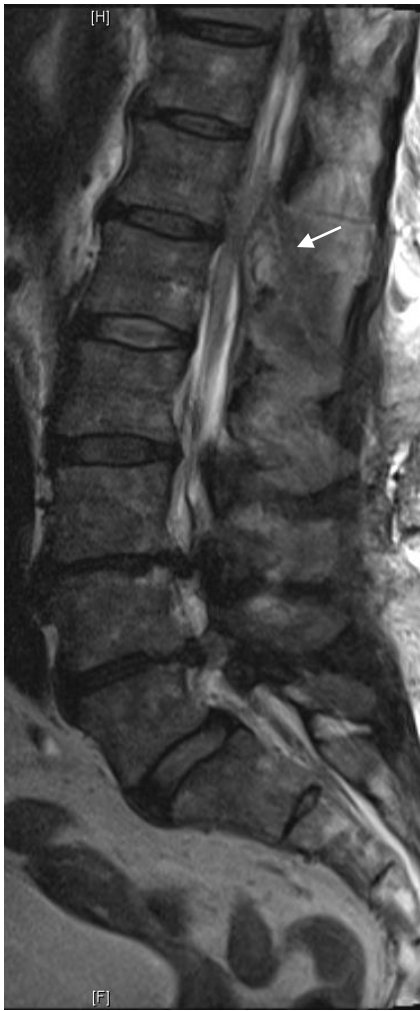


Figure 1. T2-weighted MRI sagittal plane image showing a developing T12-L1 epidural abscess.

cyclobenzaprine for muscle spasms. One week later, she visited her primary care provider for a wrist injury she sustained after multiple falls. On physical exam she was neurologically intact with no lower extremity weakness.

Nearly two months after the SCS trial, implantation of a permanent stimulator was attempted. There were no new symptoms and her abdominal pain had fully resolved. Pre-operative labs showed a normal WBC count of 10.4, INR 1.1, and Platelets 441. There was no erythema, increased tenderness, induration, or calor on the back upon examination. Upon incision and dissection of superficial and deep tissues, a disproportionate amount of incisional oozing was encountered with a total procedure estimated blood loss of 150 mL. Despite sufficient local anesthetic

administration and adequate sedation, our patient continued to move and was unable to tolerate the procedure during the attempted insertion of leads at T12-L1. The patient experienced repeated episodes of apnea and oxygen desaturations. Due to patient safety concerns, all leads and instruments were removed and the procedure was aborted. Hemostasis was maintained and wounds were closed sterilely and dressed. Of note, there were no signs of surgical site infection such as erythema, pus, or edema prior to or after the procedure. She was discharged home in stable condition with a scheduled follow up in our clinic in 14 days.

That night, she presented to the ED via ambulance for severe back pain. Initial vital signs showed that she had a temperature of 99.3°, heart rate 86, blood pressure 119/61, and respiratory rate 16. Initial assessment demonstrated 5/5 strength in bilateral lower extremities and another normal WBC count of 10.1. CT scan of her lumbar spine showed osseous findings at the T12-L1 right facet joint suspicious for developing osteomyelitis. Subsequent magnetic resonance imaging (MRI) of her lumbar spine (Figure 1) demonstrated a posterior epidural abscess at T12-L1 with associated osteomyelitis. Neurosurgery was consulted and, as there was no significant mass effect on the neural structures and the patient showed no neurological deficits, they opted for medical management instead of surgical evacuation of the abscess. A culture obtained by interventional radiology grew methicillin-sensitive *Staphylococcus aureus* (MSSA). The patient was placed on a six week IV cefazolin regimen. After an 11 day hospital admission, the patient was discharged to a long-term care facility with significant improvement in her pain and no neurologic deficits. She continued to receive her IV cefazolin there, and ultimately her infection was resolved. She currently has no sequelae from her infection and is still interested in receiving the permanent SCS. We have temporarily postponed her permanent SCS implantation pending further workup with the Infectious Disease specialists. We will also continue to follow our patient in the Pain Clinic and perform future imaging and labs.

## DISCUSSION

This case illustrates the potential for severe complications from a spinal cord stimulator trial and the

difficulty in recognizing a subacute manifestation of a spinal epidural abscess (SEA). Even with strict aseptic technique and prophylactic antibiotics, any foreign object introduced into the body can serve as a nidus for infection.<sup>1,2,14</sup> Risk factors for SEA consist of any immunosuppressive state including diabetes mellitus, any spinal intervention such as epidural needles or placement of stimulators, and finally, a potential source of infection including intravenous drug abuse or bacteremia.<sup>4,10,12</sup> Another potential source of infection is poor wound care and patient noncompliance.

Presentation of an epidural abscess can vary, with the most common signs and symptoms being back pain, fever, and neurologic deficits such as motor weakness, sensory abnormalities, and bowel or bladder incontinence.<sup>3,4,5,7,20</sup> Due to non-specific symptoms, SEA is often misdiagnosed, especially in those neurologically intact.<sup>4,8,20</sup> History of chronic back pain and post-laminectomy syndrome may lead to a delayed diagnosis.<sup>8</sup> Leukocytosis is only present in about two thirds of patients,<sup>4</sup> while fever is only present in 43% of patients with SEA.<sup>3</sup> Gadolinium enhanced MRI is the imaging of choice when spinal infection is suspected.<sup>18</sup>

MSSA is the most common pathogen identified, seen in 64% of patients with SEA.<sup>3</sup> This is followed by MRSA (20%), gram-negative bacteria (8%), as well as a few less common organisms (8%).<sup>3</sup> Historically, the treatment for spinal epidural abscess has been emergent surgical intervention, but recent evidence points to medical management in select patients.<sup>3,6</sup> Due to the difficulty in clearing infections in the presence of a retained foreign body, removal of implanted hardware is imperative.<sup>1,2</sup> In those with an active MSSA infection, a six week minimum of antibiotic therapy with either cefazolin or nafcillin is recommended due to the likelihood of coexisting vertebral osteomyelitis, which occurs in up to 80% of patients with SEA.<sup>4,16</sup>

This case demonstrates the variable nature and presentation of a spinal epidural infection. SEA has been found to develop as rapidly as 72 hours or even up to 1 year following epidural instrumentation.<sup>1,2</sup> Furthermore, physicians should maintain a high level of suspicion for SEA in high risk individuals as presenting signs and symptoms are often minor and non-specific, and occasionally asymptomatic.

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