Case Report

A SERIOUS CONSEQUENCE OF SKIN PUNCTURE BY A METAL NAIL: LUMBAR EPIDURAL ABSCESS

Case report and a brief review of literature

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ABSTRACT

Epidural abscesses rarely occur in healthy persons who have no predisposing conditions. This report describes a case of lumbar epidural abscess that developed in a young healthy man after the skin of his hand was pierced by a nail.

INTRODUCTION

Spinal epidural abscess (SEA) is a rare condition that is associated with high morbidity and mortality (1-8). Research indicates that the frequency of this type of abscess may be rising (8,9). The most common predisposing factors in patients with SEA are diabetes mellitus, chronic renal failure, alcoholism and malignancy (1,3-5,10-13). It is very unusual to find this type of lesion in a healthy individual who has no predisposing conditions. We report a case of SEA that developed in a healthy young person who had sustained a hand injury from a metal nail.

CASE REPORT

A 26-year-old male presented with the complaint of lumbar pain. He had no history of serious illness; however, 5 days earlier, a nail had pierced the skin of the index finger on his left hand. He had taken some anti-inflammatory medication for the backache, but this had provided no relief. On admission to hospital, physical examination revealed a body temperature of 38.6 °C, heart rate 96/min, blood pressure 110/70 mmHg, and redness and pain in the left hand. The results of a neurological assessment were normal except for 2/5 motor weakness in the left anterior tibialis muscle. Laboratory studies revealed a peripheral white blood cell count of 23,800/mm3, erythrocyte sedimentation rate 73 mm/hr, serum C-reactive protein 96 mg/dL, and normal serum glucose and creatinine levels. An ELISA test for human immunodeficiency virus was negative. Three separate blood cultures were also negative. Magnetic resonance imaging (MRI) of the lumbar spine demonstrated a 38x12x54-mm multilobular cystic mass extending from L4 to S1. The lesion was heterogeneously hypointense on T1-weighted images and heterogeneously hyperintense on T2-weighted images, and slightly enhanced after intravenous gadolinium administration (Figs. 1,2,3).

The patient was diagnosed with lumbar epidural abscess, and was transferred to the Neurosurgery Department. Surgery was
performed immediately, with a procedure involving laminectomy at L5 and drainage of the abscess. Gram staining of a specimen of drainage material revealed gram-positive cocci. The patient was started on parenteral cefazolin sodium 3x1 g daily. Methicillin-sensitive Staphylococcus aureus was isolated from microbiological cultures.

Postoperatively, the patient's body temperature returned to normal, the inflammation in his hand disappeared, and the muscle weakness in his left anterior tibialis muscle resolved. After 3 weeks of parenteral antibiotics, he was discharged on a new regimen of oral trimethoprim/sulfamethoxazole (160/800mg) 2x1 tb daily for 3 weeks.

Fig. 1: Sagittal T1-weighted lumbar MRI demonstrates a multilobular, heterogenous cystic mass extending from L4-S1.

Fig. 2: The lesion is slightly enhanced with gadolinium IV.

Fig. 3: Axial T1 weighted images with gadolinium IV.
DISCUSSION

Spinal epidural abscess is a potentially devastating disease. Peak incidence is in the sixth and seventh decades of life, and such lesions are rare in the young population. As mentioned, diabetes mellitus, chronic renal failure, incompetent immune system, and alcoholism are frequent predisposing factors in patients with SEA (11). The risk factors in young patients are less clear. In a retrospective investigation of 101 cases of spinal infection, Hadjipavlou found that one-fourth of the young patients were intravenous drug abusers (2). Our patient was only in his twenties, and his work-up revealed no evidence of any immunocompromising illness or any other comorbid condition.

Lumbar epidural abscess is a well-known complication of epidural anesthesia and epidural injections, but the majority of affected patients are infected through hematogenous spread of bacteria from distant sites. In a study of 29 patients with SEA, Del Curling identified a distant source of infection in 59% of the cases (3). In research on 40 SEA patients, Hlavin noted skin and soft-tissue injuries as the leading modes of entry (1). Our patient had no history of a spinal procedure, and his abscess was presumed to have arisen by hematogenous spread from a soft-tissue infection of the hand.

Reports have identified S. aureus as the causal agent in more than 60% of SEA cases (1,2). Retrospective studies of pyogenic spinal infection have shown that Streptococcus spp. are the next most frequent causes (20% of cases), and that the remaining 20% of SEA cases are caused by a variety of other organisms (1,2,8,14,15).

The high frequency of S. aureus in SEA is explained by this agent’s ability to produce abscesses, and the fact that it can infect both normal and immunocompromised hosts. Interestingly, most recent reports have identified a range of other types of organisms with a predominance of gram-negative species (3). Changes in the types of infectious causes detected over time may be explained by the introduction of antibiotics in 1939, the increasing use of immunosuppressive agents, and the rising incidence of immunosuppressive diseases.

A definitive diagnosis of SEA requires careful patient evaluation. The most common symptoms are spinal pain, neurological deficit, fever and headache (3). Hancock has defined this disease as a “painful, febrile, spinal syndrome” (16). The key to diagnosing SEA is a high index of suspicion. Plain radiographs do not demonstrate these lesions directly, but abnormalities such as bone degeneration or spinal deformity may be evident (3). After MRI was introduced, it quickly became the primary tool for diagnosing SEA (17-19). The most common MRI finding is a discrete epidural mass that is iso- or hypointense on T1-weighted images and non-homogeneously hyperintense on T2-weighted images. Before MRI was available, myelography was the standard diagnostic method for these cases. This technique remains the diagnostic procedure of choice for some unusual cases associated with meningitis (3,19).

The treatment of choice for SEA has not changed over the years. The recommended strategy is immediate surgical drainage and an extended course of antibiotics. For posterior epidural abscesses, the most common treatment procedure is laminectomy and decompression of all involved (9,20,21). An anterior epidural abscess may require an anterior approach if there is associated osteomyelitis or discitis. A few published studies have also discussed medical treatment for SEA. Wheeler reported a case in which an extensive SEA was successfully treated without surgery (22). The same author also reviewed the literature from 1970 to 1990, and documented 37 cases of conservative management for this type of abscess. The report concluded that there is no consensus on any form of decompressive surgical management for SEA. In Del Curling’s above-mentioned study of 29 SEA patients, the author suggested that medical treatment should only be administered in cases where there is no neurologic deficit and the causal microorganism is positively identified (3). He also noted that all the deaths and poor recoveries were in cases where the patient had been paralyzed for more than 48 hours prior to surgery. Harrington suggested an additional guideline for non-surgical management of SEA, namely, that this approach should only be used in hospitals with full spinal surgical capability (10). This ensures that emergent surgical decompression can be performed if the patient’s condition suddenly deteriorates.
The prognosis for patients with SEA has improved dramatically since this condition was first described. In the initial report by Dandy in 1926, the author recorded 83% mortality in 35 patients (23). The advent of antibiotics and continuous development of new drugs have resulted in significant drops in mortality (22). Baker reported 18% mortality in 1975 (4), and Del Curling documented a 6.9% rate in 1990 (3). The overall decrease in mortality and morbidity that has been observed in SEA series is thought to be due to advances with antibiotics and earlier detection of these lesions.

Our case is of special interest because, although soft-tissue infections are common after skin punctures caused by nails, it is extremely unusual to see a case of SEA related to such an injury in a young healthy patient with no predisposing factors. Good functional outcome in cases of SEA requires timely diagnosis and rapid initiation of therapy.

REFERENCES


