THORACIC EPIDURAL ABSCESS DUE TO COMMUNITY-ACQUIRED METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS

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ABSTRACT

A spinal epidural abscess threatens the spinal cord or cauda equina by compression and also by vascular compromise. If left untreated, an expanding supplicative infection in the spinal epidural space can impinge on the spinal cord, producing sensory symptoms and signs, motor dysfunction, and ultimately paralysis, followed by death. Hence, early intervention undoubtedly improves the outcome. The authors report a case of a 27-year-old female patient, who presented with paraplegia, and was found to have thoracic epidural abscess due to community-acquired methicillin-resistant Staphylococcus aureus.

Keywords: Spinal cord, Cauda equina, Infection, Laminectomy, Drainage.

INTRODUCTION

Epidural abscess is a rare infectious disorder, affecting 0.2-2 patients a 10,000 hospital admissions [1]. Staphylococcus aureus is the most common pathogen implicated in the condition, being cultured in about 75% of the cases seen in any hospital setup. Methicillin-resistant S. aureus (MRSA) is responsible for 26% of these cases, making it a very significant microorganism in this area [2]. Most patients with spinal epidural abscess have one or more predisposing conditions, like an underlying disease or risk factor (which may be diabetes mellitus, alcoholism, or HIV infection), a spinal abnormality or intervention, or a potential local or systemic source of infection [3,4]. Bacteria gain access to the epidural space through contiguous spread (about one-third of cases) or hematogenous dissemination (about half of cases); in the remaining cases, the source of infection is not identified. Less common causative pathogens include coagulase-negative staphylococci, such as Staphylococcus epidermidis and Gram-negative bacteria, particularly, Escherichia coli and Pseudomonas aeruginosa [5].

Epidural infection can injure the spinal cord either by mechanical compression or indirectly as a result of vascular occlusion caused by septic thrombophlebitis [6]. Because abscesses are more likely to develop in larger epidural spaces that contain infection-prone fat, they are a more common in posterior than in anterior areas and in thoracolumbar than in cervical areas [7]. Spinal epidural abscesses, generally, extend over three to four vertebrae [8], but in rare cases, they involve the whole spine, resulting in the so-called panspinal infection [9].

CASE REPORT

A 27-year-old female had presented with a backache involving the lower thoracic region and fever for a duration of 12 days. On the 9th day after the onset of backache, she developed weakness of the lower limbs, mainly involving the distal muscles. A day later, she developed band-like sensation above the umbilicus, with diminished sensory perception below the level of the umbilicus. On the same day, she also developed urinary retention and was taken to a local hospital where she was catheterized. She was then referred to our hospital for further management. There was no history of a cough, breathlessness, anorexia, weight loss, burning micturition, intravenous drug abuse, or administration of vaccine/spinal anesthesia prior to the development of these symptoms.

On examination, the patient was febrile. There was no evident pallor or lymphadenopathy. Power in her lower limbs was 0/5, while it was 5/5 in her upper limbs. Deep tendon reflexes in lower limbs were absent, with plantar reflex also being unresponsive. Only the upper abdominal reflexes were present, with Bevorr’s sign positive (seen with the selective weakness of lower abdominal muscles). All modalities of sensation were diminished below the level of umbilicus. There was also localized swelling and tenderness at the level of D9 vertebra.

Investigations done showed hemoglobin of 10.6 g/dL, total leucocyte count of 15,600 cells/cu.mm. Differential leucocyte counts showed 81% of neutrophils and 19% of lymphocytes. ESR was raised at 92 mm/hr. Liver function tests, renal function tests, serum electrolyte levels were within normal limits. Her chest X-ray was also normal. Mantoux test was negative. Magnetic resonance imaging (MRI) of the spine showed an epidural abscess, extending from D9 to D12, measuring 9.4 cm × 0.8 cm × 0.9 cm, causing compression and anterolateral displacement of the dorsal spinal cord (Fig 1). There was also paraspinal soft tissue collection.

Fig. 1: Magnetic resonance imaging of thoracic spine showing D9-12 epidural abscess, with no evidence of vertebral osteomyelitis.
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A neurosurgical opinion was sought, and the patient was taken up for surgery. Dorsal laminectomy was done with the aspiration of the pus collection in the epidural space. The pus culture from the abscess site showed growth of MRSA. Blood culture also showed significant growth of MRSA. The patient was treated with linezolid. On the 30th post-operative day, her lower limb power had improved to 3/5 as depicted in Table 1. She was then discharged with advice to continue linezolid for 2 more weeks.

**DISCUSSION**

Clinical presentation of an epidural abscess may be quite variable. The clinical triad of fever, back pain, and neurologic deficit may not be present in most patients [10]. A diagnosis of a spinal epidural abscess is suspected on the basis of clinical findings and supported by laboratory data and imaging studies, but can be confirmed only by drainage. Although leukocytosis is detected in about two-thirds of patients and inflammatory markers are almost uniformly elevated, they are not specific for spinal epidural abscess. Bacteremia causing or arising from the spinal epidural abscess is detected in about 60% of the patients, more so in those infected with *S. aureus* than with other organisms [11]. Both MRI with intravenous administration of gadolinium and myelography followed by computed tomography of the spine are highly sensitive in diagnosing spinal epidural abscess [12].

Management of such patients consists of both medical and surgical therapy. Empirical antibiotic coverage should include antistaphylococcal antibiotics. With the increasing incidence of MRSA infections, coverage with linezolid should be supplemented by other agents. The majority of retrospective studies provide support for the overwhelming consensus that surgical drainage together with systemic antibiotics is the treatment of choice [13]. Because the preoperative neurologic stage is the most important predictor of the final neurologic outcome, and because the rate of progression of neurologic impairment is difficult to predict, decompressive laminectomy, and debridement of infected tissues should be done as soon as possible, as evidenced by several other studies [10]. The single most important predictor of the final neurologic outcome remains the patient’s neurologic status immediately before and after surgery [14].

**REFERENCES**


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**Table 1: Progression of neurological status in the patient**

<table>
<thead>
<tr>
<th>Neurological status</th>
<th>1 day before operation</th>
<th>1 month after operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C8: Hand intrinsic muscles</td>
<td>5/5 (R), 5/5 (L)</td>
<td>5/5 (R), 5/5 (L)</td>
</tr>
<tr>
<td>L2: Hip flexion</td>
<td>0/5 (R), 0/5 (L)</td>
<td>3/5 (R), 3/5 (L)</td>
</tr>
<tr>
<td>L3: Knee extension</td>
<td>0/5 (R), 0/5 (L)</td>
<td>3/5 (R), 3/5 (L)</td>
</tr>
<tr>
<td>L4: Ankle dorsiflexion</td>
<td>0/5 (R), 0/5 (L)</td>
<td>3/5 (R), 3/5 (L)</td>
</tr>
<tr>
<td>L5: Great toe extension</td>
<td>0/5 (R), 0/5 (L)</td>
<td>3/5 (R), 3/5 (L)</td>
</tr>
<tr>
<td>S1: Ankle plantar flexion</td>
<td>0/5 (R), 0/5 (L)</td>
<td>3/5 (R), 3/5 (L)</td>
</tr>
<tr>
<td>Sensations</td>
<td>Anesthesia</td>
<td>Anesthesia</td>
</tr>
<tr>
<td>Ankle reflex</td>
<td>Absent</td>
<td>+</td>
</tr>
<tr>
<td>Knee reflex</td>
<td>Absent</td>
<td>+</td>
</tr>
</tbody>
</table>

R: Right, L: Left, +: Present