Case Report

Minimally Invasive Surgery of Extensive Spinal Epidural Abscess: A Case Report

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Summary

Spinal epidural abscess (SEA) is a rare condition usually been treated by multilevel laminectomies. A 78-year-old female patient was hospitalized with prediagnosis of stroke and demyelinating disease and tetraplegia developed. Magnetic resonance imaging (MRI) demonstrated a SEA beginning from the level of C5 vertebra extending to the level of L2 vertebra. It was drained via bilateral hemilaminectomy with no clinical improvement. Control MRI revealed abscess was completely drained. The patient died due to multiorgan failure on the postoperative 45th day. Extensive epidural abscess can be successfully drained via limited laminectomy. However, delay in treatment may result in poor prognosis.

Key words: Spinal epidural abscess, minimal invasive surgery, surgical treatment

INTRODUCTION

Spinal epidural abscess (SEA) is a rarely encountered disease that can result in permanent neurological deficit and death unless diagnosed early and treated. In the literature, SEA was first defined in 1761 by Morgagni(7).

The risk for SEA is high in immunocompromised individuals, in cases of intravenous drug use and alcoholism, and in patients with diabetes mellitus, cancer, and systemic infections(7,12). The most common sources of infection are skin abscesses and furuncles. In the literature, the majority of patients with SEA have been treated surgically. The performed surgical techniques include multisection...
laminectomy, laminotomy, interlaminar approach, and percutaneous abscess drainage\(^{(5,13)}\). Multisegment SEAs have been successfully treated by minimally invasive interventions\(^{(6,8,10,11,14)}\). Herein, we present a case of SEA which was successfully drained by irrigation with catheter through limited laminectomy extending from cervical to lumbar region.

**CASE PRESENTATION**

A 78-year-old female patient underwent a knee prosthesis surgery at another center 2 months ago. A purulent drainage was observed from the surgical area 1 month after the surgery. The patient was commenced on antibiotic treatment; the weakness in her arms and legs was attributed to impaired general status. The patient was referred to our hospital upon the observations of impairment in consciousness, weakness in arms and legs, and respiratory distress. The patient was hospitalized in the neurology clinic being diagnosed with stroke, demyelinating disease, sepsis, and pneumonia. Computed tomography (CT) of the brain was unremarkable. Blood culture assays, which were performed due to the patient having a high body temperature of 39°C, showed growth of *Staphylococcus aureus* (S.aureus); thus, vancomycin and ceftazidime were commenced. The patient had a C-reactive protein (CRP) level of 11.2 mg/dL (normal range, 0-0.4 mg/dL), an erythrocyte sedimentation rate of 82 mm/h (normal range, 0-20 mg/dL), and a leukocyte count of 12400 cells/µL. The findings of cervical and thoracic CT were normal. The patient provided ventilatory support due to worsened respiratory failure. On her magnetic resonance (MR) imaging performed three days later, a SEA was detected beginning from the level of C5 vertebra extending to L2 vertebra [Figures 1 (a, b)]. It was learned that the patient, who referred to our clinic, had tetraplegia for the last 3 days.

Immediate surgery was performed on the patient, and bilateral hemilaminectomy at the levels of C6, Th8, and L1 was performed using a craniotome through thoracic, cervical, and lumbar incisions, each of which was 3 cm in length. Purulent material was drained at these levels. Subsequently, a pediatric nasogastric catheter (number 6) was slowly advanced through the levels, at which laminectomy was performed, and irrigation with normal saline and controlled aspiration were carried out and repeated until the drainage of clear fluid. Clinical and neurological picture of the patient showed no alteration in the postoperative period. No growth was observed in the abscess material obtained during surgery. Spinal MR imaging performed on the 10\(^{th}\) postoperative day demonstrated that the abscess was completely drained [Figures 2 (a, b)]. The patient died due to multiorgan failure on the postoperative 45\(^{th}\) day in the intensive care unit.
**Fig 1: a,b:** Postcontrast T1-weighted sagittal MRI of the cervical (a) and Thoracolumbar (b) spine showing an extensive spinal epidural abscess

**Fig 2: a,b:** Postoperative T1-weighted sagittal MRI of the cervical (a) and thoracolumbar (b) spine showing resolution of the epidural abscess
DISCUSSION

Spinal epidural abscess is associated with increased morbidity and mortality particularly in elderly patients and in cases with poor neurological condition at the time of presentation. The classical triad of symptoms of SEA includes spinal pain, fever, and neurological deficit. In the majority of patients, microorganism spreads to the epidural area via hematogenous route. The skin, soft tissue, and urinary and respiratory tract infections are the most common sources. S.aureus is the most frequently isolated microorganism. CRP level and erythrocyte sedimentation rate are usually increased, as was in the present case.

Recently, gadolinium-enhanced MR imaging is the first choice in the diagnosis of SEA. Whilst SEA and spinal cord have the same intensity on T1-weighted images, SEA is usually characterized with a signal increase on T2-weighted images.

Primary treatment of SEA is surgery. Patients without neurological deficit can be medically treated under close monitoring. Early diagnosis and early treatment are the most important factors affecting the outcome in SEA. Preoperative neurological status is also one of the most important factors affecting the outcome in SEA. While recovery is observed in the majority of patients with incomplete paralysis and minor neurological deficit, patients confined to bed do not recover, as was in the present case, and SEA-related deaths are observed in such patients. Tetraparesis or tetraplegia is encountered in only 3% of the patients. In SEA, mortality rate ranges between 0% and 20%. The best responders to surgical treatment are those treated within the first 24 hours. Neurological deficit does not recover and mortality is increased when the surgical intervention is performed after 36 hours.

Many patients with SEA are initially misdiagnosed. The most common misdiagnoses are meningitis and intervertebral disc hernia. Cerebral ischemia, poliomyelitis, Guillain-Barré syndrome and transverse myelitis are the other initial misdiagnoses. The present case as well was considered to have first stroke and then demyelinating disease, and delay in diagnosis occurred. Thus, surgical treatment was performed 72 hours after the development of complete neurological deficit. No improvement was achieved in the neurological status of the patient since the treatment could not be performed within 36 hours.

In the literature, SEAs have been frequently treated by multisegment hemilaminectomy. Spinal instability is the major disadvantage of this treatment. Minimally invasive procedures have also been defined, as was in the present case. In general, such procedures show similarities with the technique we performed. A No. 6 nasogastric catheter can be safely advanced through the levels via limited hemilaminectomy and allows complete drainage of the abscess. Since this technique includes limited laminectomy, it does not lead to spinal instability in the late term.

CONCLUSION

In case of extensive SEAs beginning from the cervical region and extending to the lumbar region, drainage of the abscess can be provided safely by limited laminectomy and advancing the catheter through the levels. Surgical procedures that would be performed after 36 hours do not provide improvement in neurological status.

Conflict of Interest: None
REFERENCES