SPINAL EPIDURAL ABSCESS: CASE REPORT AND REVIEW OF THE LITERATURE

Chia Fang Lee¹, Jen Jen Su²

Abstract

Spinal epidural abscess (SEA) is a rare disease with poor prognosis if not diagnosed and treated early. It typically occurs at the presence of predisposing conditions including diabetes mellitus, intravenous drug abuse, immunosuppressive therapy, cancer, renal failure and HIV infection. Back pain, fever and neurological deficit are usually considered the classical triads of symptoms. Contrast-enhanced magnetic resonance image is currently the gold standard for the diagnosis of SEA. A combination of surgical drainage of abscess and prolonged antimicrobial therapy has been considered as the treatment of choice. We reported a 58-year-old woman who admitted due to neck pain then upper limb numbness and weakness. Cervical magnetic resonance imaging revealed a cervical epidural abscess. Treatment including surgical drainage and evacuation of spinal abscess and intravenous antibiotics ameliorated the neurological deficits.

Key Words: Spinal epidural abscess (SEA), Spinal cord compression, Spondylodiskitis

Introduction

The low incidence of this clinical entity and the overlap of nonspecific symptoms in elderly patients, in whom degenerative spinal disease is common, makes it difficult to diagnose spinal epidural abscess (SEA).¹ Prompt diagnosis and intervention is crucial to prevent irreversible neurological dysfunction and life-threatening sepsis.

The typical treatment for SEA includes the surgical drainage of the abscess followed by antibiotics therapy.¹³ Many studies report several prognostic factors influencing a patient’s functional outcome.²³ In this study, a 58-year-old woman admitted for neck pain subsequently experienced upper limb numbness and weakness. Magnetic resonance imaging revealed a cervical epidural abscess. She underwent drainage and evacuation of the spinal abscess, followed by intravenous antibiotic administration. These interventions ameliorated her neurological deficits.

Case Presentation

A 58-year-old housewife experienced neck pain that persisted for half a month. The pain was compressive-like with no radiation or Lhermitte’s signs, and gradually extended to the anterior chest and back. The patient experienced no urinary difficulty or incontinence, but mentioned constipation. She had visited a local clinic for pain-relief during the past 2 weeks; parenteral and oral anal-
gesic partially relieved the pain, but only temporarily. The patient denied fever. She went to the emergency room (ER) after acute onset of left arm numbness and general weakness of the left arm.

The medical history of this patient included diabetes mellitus, hypertension, and hepatitis B (HBV) carrier. She used oral hypoglycemic agents Repaglinide and Acarbose for blood sugar control. Her fasting blood glucose ranged from 150 to 200 mg/dL. The patient reported a one-year history of post-nasal drip and chronic cough, but denied any spinal injection, dental procedure, acupuncture, IV drug use, fish-bone suffocation, or local penetrating wound in the past few months.

Upon admission to the ER, the patient’s body temperature was 37.9 degree Celsius. Physical examination revealed no local tenderness in the back or cervical region. The patient displayed moderate weakness in left upper limb, with manual muscle test (MMT) scores of 2/5, whereas the power of other limbs was normal. Pinprick sensation tests revealed a decrease over the left fifth and sixth cervical dermatomes. Proprioception was intact. Deep tendon reflex was slightly diminished in the left biceps brachii, with Hoffman’s sign being positive on the right side and negative on the left.

The Babinski reflex was absent bilaterally. Blood test revealed an elevated white blood cell (WBC) count of 22660/μL with an 86% segment form. The result of cerebrospinal fluid analysis showed high WBC (112 x 10^9/μL), high total protein (946 mg/dL) and glucose (294 mg/dL; blood glucose 338 mg/dL). Cervical spine magnetic resonance image (MRI) showed spondylodiscitis in the 6th and 7th cervical vertebrae, with a long segment epidural abscess from first cervical vertebra down to the 5th thoracic column, which was more prominent on the left at 6th and 7th cervical column with cord compression. Prespinal abscess appeared from the 5th to 7th cervical column and 1st to 4th cervical level (Figs. 1). Blood culture revealed gram-positive cocci. Ceftriaxone and Vancomycin were subsequently prescribed.

The patient received 6th to 7th cervical discectomy pus drainage and anterior fusion with an autologous iliac graft the day after admission. A biopsy involving the surgical removal of necrotic tissue revealed no significant results. After the surgery, the patient experienced transient paraparesis for about 2 weeks, which gradually improved during rehabilitation. She could walk with minimal assistance and still had weakness in her left

Fig. 1-A, B. MRI of spine without/with contrast enhancement was done at admission and shows infectious spondylodiscitis in 6-7th cervical vertebral bodies and long segment epidural abscess from 1st level to 5th thoracic level and compression of 6-7th cervical cord.
proximal arm upon discharged. Further MRI of the spine followed up approximately six weeks after operation revealed long segment anterior epidural enhancement from the cervical to the 1st lumbar vertebrae without significant epidural abscess seen. No more significant epidural abscess appeared in follow-up imaging approximately six weeks after the operation.

Discussion

Spinal epidural abscess (SEA) is a rare condition with a poor prognosis if not diagnosed and treated early. Most physicians have no experience in treating SEA due to its annual incidence of only 0.2 to 2 patients per 10000 admissions. However, an aging population, the increase of surgical intervention, and the spread of injection drug use are increasing the incidence of SEA. Spinal abscess typically occurs in the presence of predisposing conditions such as diabetes mellitus (DM), intravenous drug abuse, immunosuppressive therapy, cancer, HIV infection, and renal failure. A prior related non-viral infection and muscle weakness are also highly predictive of spinal sepsis. Though gender is not a consistent risk factor for the development of SEA, some studies report male gender as a risk factor. Hyperglycemia is associated with reduced cellular immunity, reduced chemotaxis, phagocytosis, and the bactericidal activity of neutrophils and granulocytes. Poor glycemic control is associated with myocardial infarction, stroke, postoperative wound infection, and pneumonia. In this case study, the patient also had DM, which is a well-known predisposing factor for infectious diseases.

The infrequency and non-specific initial symptoms of SEA makes the condition often difficult to diagnose in its early stage. Back pain, fever, and neurologic deficit are classical symptoms of SEA. Fever can occur at any stage of progression, and is therefore a nonspecific symptom. Back pain, aggravated by percussion, occurs in 70% to 90% of patients. The progression of neurological deficits can be organized into the following stages: stage 1) back pain localized...
to the affected vertebral level; stage 2) radicular pain from the corresponding level; stage 3) motor weakness, somatosensory deficit, and sphincter dysfunction; and stage 4) paralysis. The patient showed paralysis on admission, indicating that she was at stage 4 when she was diagnosed SEA.

In general, bacteria can access the epidural space only through contiguous spread from neighboring infected structures, hematogenous dissemination, or iatrogenic inoculation. Gram-positive bacteria and especially Staphylococcus species, are the most common causative pathogens of SEA reported in the literature. Coagulase-negative Staphylococci caused infection only in patients who had previous spinal instrumentation. The presence of comorbid conditions, such as urinary tract infection, pneumonia, infected pressure sores, and intravenous drug abuse, predisposes patients to SEA with Gram-negative bacteria.

Contrast-enhanced magnetic resonance image (MRI) is currently the gold standard test for epidural abscesses because of its advantages in identifying the location, degree of mass effect, and concomitant involvement of intervertebral discs or paravertebral soft tissue. The majority of SEA was located in the lumbar region followed by thoracic and cervical regions.

The treatment of choice for SEA typically involves a combination of surgical epidural abscess drainage and prolonged antimicrobial therapy. Nonoperative treatment may be a reasonable alternative under certain conditions, including identification of the pathogenic organism, a stable neurological condition, access to magnetic resonance imaging or computed tomography for potentially rapid reevaluation, and appropriate neurosurgical consultation and nursing care. A physician may also consider nonoperative treatment for patients with severe concurrent medical condition. Poor surgical candidates with intact neurological functions on presentation or those with complete paralysis for more than four days are candidates for conservative treatment due to their poor prognosis. Considering these, and it seems unlikely for the neurological functions of our patient to ameliorate completely.

In summary, this study demonstrates a case in which cervical epidural abscess caused weakness. Characteristic neurological findings contributed to the prompt diagnosis of spinal cord lesion. Surgical draining and evacuation of the abscess followed by systemic administration of antibiotics ameliorated the patient’s neurological dysfunction.

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脊髓硬膜下膿瘍：一病例報告

李佳舫¹，蘇真真²

摘要

脊髄硬膜下膿瘍是一種少見的感染疾病。如果沒有及早診斷和治療，預後並不佳。脊髄硬膜下膿瘍比較會在一些免疫不佳的狀況，譬如濫用藥物，腎功能不佳，後天免疫不全，癌症，接受免疫抑制劑以及糖尿病患發生。

發熱，背痛以及神經學症狀是脊髄硬膜下膿瘍常見的三個症狀；輔以顯影劑的核磁共振影像檢查是診斷脊髄硬膜下膿瘍最好的方法；開刀引流膿瘍及抗生素治療是當今治療的選擇。

我們報告一位五十八歲的糖尿病患因頸部疼痛和左上臂麻木而求診，頸部核磁共振影像檢查顯現一長段脊髄硬膜下膿瘍。病人接受開刀引流膿瘍及抗生素治療後，並輔以復健後出院。

關鍵詞：脊髄硬膜下膿瘍，脊髄壓迫病變，椎間盤炎

聯絡人：蘇真真醫師
100 台北市中正區中山南路 7 號；台灣大學醫學院附設醫院神經部²
電話：02-2312-3456 轉 65335；傳真：02-2341-8395；E-mail：ntuhneuro@hotmail.com
恩主公醫院 神經内科¹