



## Case Reports &amp; Case Series

## Spinal epidural abscess: Esophageal fistula as a potential infection source

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## ABSTRACT

We present a case report of a man with a history of esophageal cancer who presented with fever, pain, and lower extremity weakness. The patient previously underwent chemotherapy, radiation, and immunotherapy treatment. He also underwent esophageal dilation, stent placement, and removal. MRI scans of the spine revealed a longitudinal spinal epidural abscess (SEA) resulting in compressive myelopathy. The suspected infection cause was gastrointestinal-associated Gram-negative rods tracking to the epidural space from an esophageal fistula. This case demonstrates the importance of early diagnosis and treatment and the role of fistula as an infection source in SEA.

## 1. Introduction

Spinal epidural abscess (SEA) is a rare infectious disorder associated with high morbidity and mortality rates [1]. Diagnosis is challenging as presenting symptoms may be non-specific [1]. *Staphylococcus aureus* is the most common cause of SEA [1] due to skin colonization.

## 2. Case report

We report a 71-year-old man with a history of stage IV esophageal cancer presenting with suspected SEA secondary to esophageal fistula. The patient had a history of chemotherapy with carboplatin and paclitaxel, 4140 cGy radiation, and immunotherapy treatment (200 mg pembrolizumab). He also had a history of esophageal dilation and stent placement. Four days after placement, the stent was removed due to worsening dysphagia and odynophagia. At this time, the patient had no other neurological symptoms. Approximately 1 month later, he presented to his primary care physician with symptoms of back pain and fever. He was suspected of having aspiration pneumonia and started amoxicillin clavulanate.

Two days after the clinic visit, he was admitted to the hospital with fever and right scapular pain. Blood cultures were positive for Gram-positive cocci and Gram-positive bacilli, which were thought to be due to a contaminant. Chest and abdomen CT scans were unremarkable;

therefore he was discharged home.

Two days after discharge he was readmitted with weakness and difficulty urinating. Neurological examination revealed 4/5 upper and 1/5 bilateral lower extremity weakness with intact sensation. There was diffuse 0/4 hypo-reflexia with absent bilateral Babinski signs. A fluoroscopically-guided L2–L3 lumbar puncture returned purulent, white fluid with 11,859/μl nucleated cells and 97% polymorphonucleocytes. CSF protein and glucose could not be calculated to high sample viscosity. He was diagnosed with bacterial meningitis and started treatment with broad spectrum antibiotics.

Despite antibiotic treatment, his lower extremity weakness progressed to 0/5. Cervical (Fig. 1a) and thoracic (Fig. 1b) MRI revealed evidence of discitis, osteomyelitis, and a posterior epidural abscess extending from C7 into the lumbar spine. Lumbar MRI showed enhancement of the distal spinal cord and conus medullaris, extending throughout the nerve roots of the cauda equina (Fig. 1c). CSF cultures grew *Streptococcus milleri* and *Enterobacter cloacae*.

The patient underwent a C7 corpectomy, C6–T1 anterior fusion, and evacuation of epidural abscess at C7–T1. Surgical cultures revealed Gram-negative bacteria *Enterobacter cloacae* and Gram-positive bacteria: *Streptococcus milleri*, *Actinomyces species*, and *Actinomyces turcicus*. A post-surgical MRI revealed an esophageal fistula (Fig. 1d), which was thought to be the infection source. Due to illness severity, the patient passed away 9 days post-admission.

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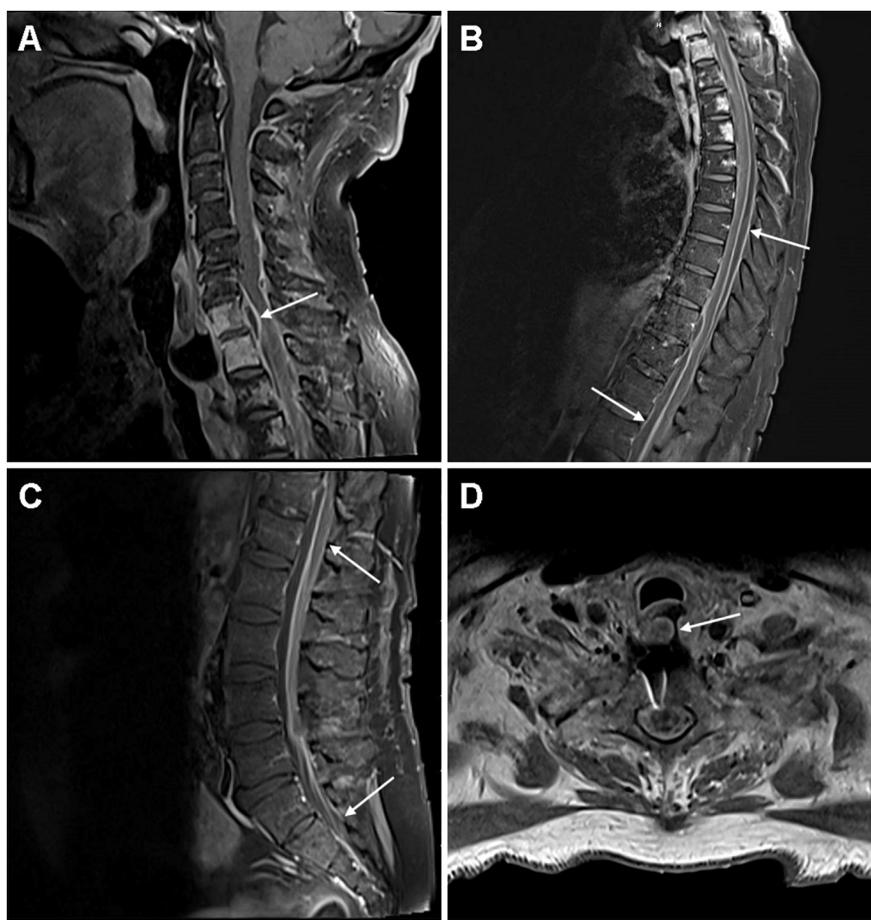


Fig. 1. MRI images for the A) cervical region (revealing a posterior epidural abscess at the C7-T1 level), B) thoracic region, C) lumbar region, and D) a post-operative esophageal fistula.

### 3. Discussion

A major challenge in diagnosing SEA is the non-specific nature of presenting symptoms. While the classic symptom triad for SEA is fever, back pain, and neurological deficit [2], it has been reported that only 37% of patients presented with all three symptoms [3] and 74% of SEA cases were initially misdiagnosed [1]. Motor weakness at 4–48 h is a poor prognostic sign, thus early diagnosis is critical [4]. In our patient, diagnosis was delayed because his initial presentation lacked the classical triad. Furthermore, *Staphylococcus aureus* is the most common species associated with SEA [3], however, our patient's cultures grew *Enterobacter cloacae*, a species that typically colonises the gastrointestinal tract.

The patient's history was remarkable for esophageal dilation, stent placement/removal, and esophageal cancer with chemotherapy and radiation. Esophageal fistula presenting as epidural abscess has been reported to be a rare complication of esophageal dilation [5], stent placement/removal [6], endoscopy [7], and radiation [5,6]. A post-surgical MRI revealed an esophageal fistula, a potential source of the epidural abscess based on his risk factors and the Gram-negative bacteria.

### 4. Conclusion

Our case emphasizes: 1) the importance of recognizing early non-localizing symptoms (e.g. fever and back pain) in SEA and 2) the role of esophageal fistula as an infection source, specifically when atypical Gram-negative species are identified. Finally, early diagnosis and treatment are critical in preventing morbidity and mortality.

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None.

### Declarations of interest

None.

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