

## Case Report

# Concomitant epidural and subdural spinal abscess: a case report

Laura B. Ngwenya, MD, PhD<sup>a,1</sup>, Luciano M. Prevedello, MD, MPH<sup>b</sup>, Patrick P. Youssef, MD<sup>a,\*</sup>

<sup>a</sup>Department of Neurological Surgery, The Ohio State University Wexner Medical Center, N1014 Doan Hall, 410 W 10th Ave, Columbus, OH 43210, USA

<sup>b</sup>Department of Radiology, The Ohio State University Wexner Medical Center, Room 460, 395 W 12th Ave, Columbus, OH 43210, USA

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### Abstract

**BACKGROUND CONTEXT:** Spinal subdural abscess (SSA) is a rare occurrence for which the management typically involves open surgical removal and washout.

**PURPOSE:** This case report aims to review the literature and discuss the management of patients with SSA.

**STUDY DESIGN:** We present a case of a 33-year-old female who presented with a spinal epidural abscess and concurrent SSA. She presented in the context of intravenous (IV) drug use, back pain, and generalized lower extremity weakness.

**METHODS:** The literature was reviewed with a focus on modern treatment options for SSA. Our patient was managed with IV antibiotics, and separate laminectomies and washouts for both lesions.

**RESULTS:** The patient recovered well with return of neurologic function and normalization of infection markers. The review of the literature resulted in a management flowchart that will help direct treatment of SSA.

**CONCLUSIONS:** The literature suggests that in a patient with a definitive diagnosis of SSA, limited surgical management and IV antibiotics are the mainstay of treatment in a patient with a decline in neurologic function. There may be a role for expectant management in the absence of diagnostic imaging or the neurologically stable patient. © 2015 Elsevier Inc. All rights reserved.

### Keywords:

Intravenous drug use; MRI; Spinal epidural abscess; Spinal infection; Spinal subdural abscess; Surgical management

### Introduction

Spinal infections can present as spine surgery emergencies because of the risk of sudden irreversible neurologic deficit. The most common spine infections include osteodiscitis and associated spinal epidural abscess (SEA). Spinal epidural abscess is easily recognized on magnetic resonance imaging (MRI), and the management of such infections has been discussed widely in the literature [1–4]. However, spinal subdural abscess (SSA) is a less common, but no less serious threat to neurologic function. Here we report a case of a patient who presented with a lumbar SEA and

was found to have a concomitant SSA. A review of the relevant literature and discussion of treatment options is presented.

### Search methods

A US National Library of Medicine–National Institutes of Health (PubMed) search was conducted. Search terms included “subdural abscess spine (al)” and “subdural infection spine (al).” These mapped to, and included, the medical subject heading terms of “subdural space,” “empyema, subdural,” and “infection.” A total of 219 records were identified, of which the title and abstract were reviewed for relevance. After non-English-language articles were excluded, a total of 45 articles were identified, including 3 comprehensive reviews that spanned the historical nature of SSA in the pediatric and adult literature [5–7]. Because the focus of our review was to identify diagnostic and treatment options in adult patients within the modern imaging and antibiotic era, relevant clinical articles from 2005 to the present were critically reviewed. Only case reports and case series were available in the literature;

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\* Corresponding author. Department of Neurological Surgery, The Ohio State University Wexner Medical Center, N1014 Doan Hall, 410 W 10th Ave, Columbus, OH 43210, USA. Tel: (+1) 614-366-6572; fax: (+1) 614-293-4281.

E-mail address: [Patrick.Youssef@osumc.edu](mailto:Patrick.Youssef@osumc.edu) (P.P. Youssef)

<sup>1</sup> Present address: Department of Neurological Surgery, San Francisco General Hospital, University of California San Francisco, Room 101, Bldg 1, 1001 Potrero Ave, San Francisco, CA 94110 USA.

therefore, a formal systematic review or meta-analysis was not pursued.

### Case report

A 33-year-old female with a history of intravenous drug use (IVDU) and hepatitis C presented to an outside hospital with a 1-month history of low back pain. Computed tomography scan was concerning for left psoas muscle and paravertebral muscle abscess; therefore, the patient was transferred to our institution for further care. On admission, the patient had diffuse bilateral lower extremity weakness (4 of 5 motor strength) and intermittent decreased sensation in bilateral lower extremities. She denied bowel or bladder incontinence, did not have saddle anesthesia, and had intact rectal tone. Admission laboratory work revealed an Erythrocyte sedimentation rate (ESR) of 108 mm/hour (normal lab value [nl] <20), C-Reactive Protein (CRP) of 361 mg/L (nl <10), White Blood Cell (WBC) count of 15.9 K/ $\mu$ L (nl range: 4.5–11.0), and negative blood cultures. Magnetic resonance imaging revealed an L2–L4 epidural abscess without evidence of osteodiscitis (Fig. 1). In addition, imaging suggested a possible thoracic subdural abscess. However, thoracic spine imaging was limited by motion artifact and a definitive diagnosis of SSA was not made initially.

Because of the patient's weakness on exam and systemic markers suggesting she was at risk of medical management

failure, she was taken to the operating room for a lumbar laminectomy and drainage of epidural abscess. Because of her lack of meningitic signs, subdural exploration was avoided and there was no durotomy. While the patient remained intubated and sedated, a postoperative MRI of the entire neuraxis was done to further evaluate the presence and extent of SSA. Cultures sent from the operating room grew methicillin-sensitive *Staphylococcus aureus*. The patient subsequently underwent computed tomography-guided drainage of the psoas abscess, which grew the same organism. Postoperative MRI revealed a cervicothoracolumbar subdural collection (Fig. 2). Despite response to intravenous (IV) nafcillin, the patient did not show any improvement in her neurologic exam; therefore, she was taken back to the operating room 1 week later for exploration of the subdural collection. A T7 laminectomy with partial T6 and T8 laminectomies was performed and dura was opened. Thick phlegmonous material was seen and collected for culture (Fig. 3). The area was copiously irrigated. Cultures and pathology from the subdural collection revealed necrotic debris and tissue with necropurulent inflammation, and no organisms were seen.

The patient continued to do well with treatment with IV antibiotics and was discharged with long-term antibiotic therapy. At 1-month follow-up, the patient had improved to full strength, with intact sensation, and inflammatory markers were improved with an ESR of 55 mm/hour, CRP of 10 mg/L, and WBC of 5.5 K/ $\mu$ L.

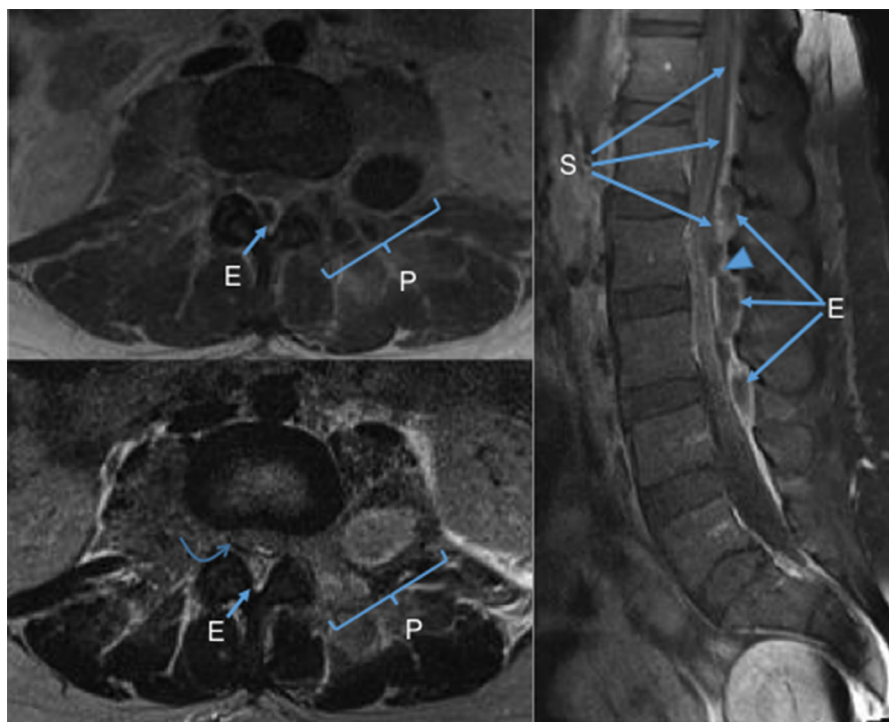


Fig. 1. Preoperative magnetic resonance imaging (MRI) of the lumbar spine. (Top left) T1-weighted contrast enhanced axial imaging demonstrates the ring-enhancing epidural abscess (E) in the lumbar spine. (Bottom left) T2 axial shows a fluid collection noted external to the dura (curved arrow). (Right) Sagittal T1 with gadolinium imaging redemonstrates the epidural abscess and also the subdural abscess (S), which was confirmed on repeat imaging. The transition between epidural and subdural collections is depicted at the L2–L3 levels (arrowhead). A paraspinous abscess (P) was also present involving the left paraspinous musculature and left psoas muscle.

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