

Successful medical treatment of spinal epidural abscess

Bo-Ren Xiao¹, Chih-Wei Wang², Jung-Chung Lin¹, Feng-Yee Chang¹

¹Division of Infectious Diseases and Topical Medicine, Department of Internal Medicine and ²Department of Radiology, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan

Received: October 9, 2006 Revised: February 7, 2007 Accepted: March 30, 2007

Spinal epidural abscess is a rare but potentially fatal disease. A 67-year-old female suffered fever and painful swelling of the right knee and lower leg for one week. Both synovial fluid and blood cultures yielded methicillin-sensitive *Staphylococcus aureus*. Low back pain developed and fever was sustained despite the administration of intravenous oxacillin. Magnetic resonance imaging (MRI) of the thoracolumbar spine revealed spinal epidural abscess from T12 to S1. Because of severe hypoalbuminemia and general anasarca and followed by exploratory laparotomy for massive duodenal bleeding, she did not receive surgical intervention for the spinal epidural abscess. After intravenous administration of oxacillin 2 g 4-hourly for 12 weeks, she recovered and follow-up MRI confirmed the efficacy of the medical treatment. She remained well at 1-year follow-up. In a patient with minimal neurological deficit or surgical contraindication, spinal epidural abscess can be successfully treated with a medical regimen.

Key words: Drug therapy; Epidural abscess; Treatment outcome

Introduction

Spinal epidural abscess (SEA) is an uncommon disease with a frequency of 0.2 to 2 cases per 10,000 hospital admissions and a mortality rate of 10-30% due to potentially permanent neurological deficit [1,2]. The incidence rate is increasing because of increased intravenous drug abuse, advancement of image diagnosis and clinician awareness [3]. Risk factors of SEA include underlying diabetes, chronic liver disease, intravenous drug abuse, immunocompromised condition, alcohol abuse, spinal surgery or trauma, cancer and steroid use [1-7]. The accurate diagnosis of SEA in the early stage is difficult because of its diverse clinical presentation mimicking other disease. The classic triad of fever, spine pain and neurological abnormalities is present in only 10-15% of SEA patients when they are admitted or visit the emergency department [4]. In a patient with SEA, the value of surgical intervention versus antimicrobial therapy alone is controversial. We

report a patient with SEA treated successfully with a medical regimen.

Case Report

A 67-year-old female was admitted via emergency department because of fever and progressive painful swelling over right knee and right lower leg for one week. She had a history of herniation of intervertebral disc with spinal surgery 4 years ago. On admission, the physical examination showed a body temperature of 38.2°C, and an erythematous discoloration, swelling, local heat and tenderness of the right knee and right lower leg, a grade III pitting edema, and a positive straight leg raising test of the left lower limb. Initial laboratory work-up revealed leukocytosis with white cell count of $21 \times 10^3/\text{mm}^3$, elevated C-reactive protein of 27.9 g/dL and hypoalbuminemia of 2.4 g/dL. Arthrocentesis of her right knee joint showed turbid fluid.

Gram stain revealed Gram-positive cocci. Empiric intravenous infusion with oxacillin 2 g every 4 h was administered. Both synovial fluid and blood cultures yielded methicillin-sensitive *Staphylococcus aureus*. The painful swelling of the right knee improved but

Corresponding author: Dr. Feng-Yee Chang, M.D., Ph.D., Division of Infectious Diseases and Tropical Medicine, Department of Medicine, Tri-Service General Hospital, Number 325, Section 2, Cheng-Kung Road, Neihu, Taipei 114, Taiwan.
E-mail: fychang@ndmctsgh.edu.tw

fever was sustained. An echocardiogram showed perimembranous type ventricular septal defect, elevation of pulmonary artery pressure (58 mm Hg), and bilateral pleural effusion.

However, the patient still complained of low back pain with bowel ileus phenomenon. On the sixth hospital day, magnetic resonance imaging (MRI) of the thoracolumbar spine disclosed SEA of ventral aspect from T12 to S1 and of dorsal aspect from L4 to L5 and iliopsoas muscle abscess (Fig. 1A, 1B and 1C). Spondylitis of L1 and L2 vertebral bodies was also noted (Fig. 1A and 1B). MRI follow-up at 14 days showed reduced degree of inflammatory change.

Unfortunately, massive duodenal bleeding developed since the twenty-third hospital day. The patient received intubation with mechanical ventilation two days later because of severe hypoalbuminemia (2.1 g/dL), pulmonary edema, and massive pleural effusion with acute respiratory failure. Exploratory laparotomy with ulcerectomy was performed due to persistent uncontrolled bleeding with medical regimen on the thirty-third hospital day. The mechanical ventilator was removed on the sixty-eighth hospital day, and low-grade fever then subsided. Intravenous oxacillin was administered for a total of 12 weeks. The interval MRI follow-up showed complete resolution

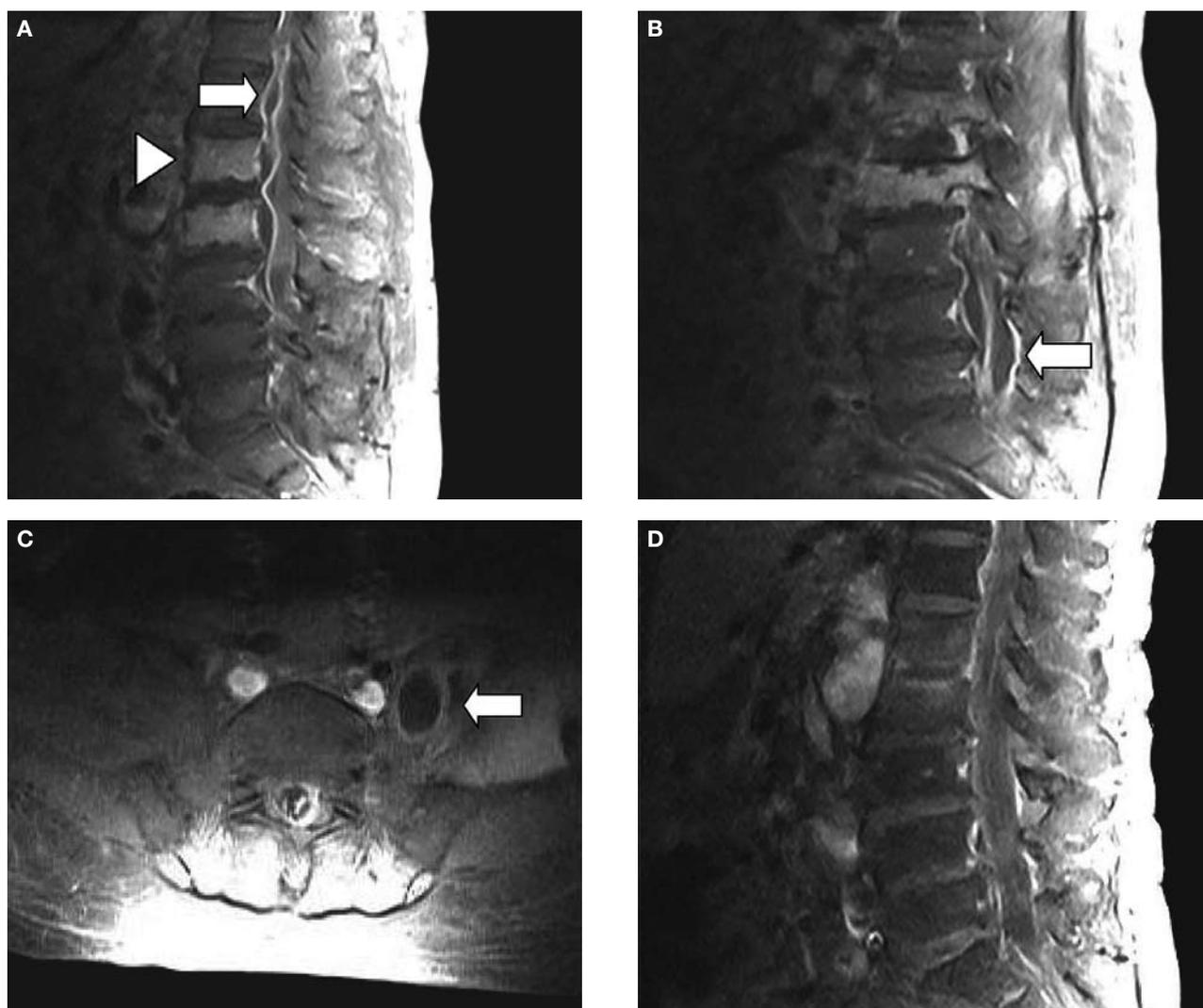


Fig. 1. Epidural abscess, spondylitis, and iliopsoas muscle abscess revealed by contrast-enhanced magnetic resonance imaging. On the sixth hospital day, T1-weighted imaging disclosed epidural abscess over the ventral epidural space from T12 to S1 level (A; arrow), and the dorsal epidural space at L4 and L5 level (B; arrow), with compression of the dural sac. There was diffuse enhancement of the L1 and L2 vertebral bodies (arrowhead) without evidence of tumor-like lesions (A), and left iliopsoas muscle abscess was noted at L5 and S1 level (C; arrow). The epidural and iliopsoas muscle abscesses resolved completely before discharge (D).

of epidural abscess and psoas muscle abscess, which confirmed the efficacy of the medical treatment (Fig. 1D). She was discharged on the ninetieth hospital day, and could walk by herself without neurological deficit at 3-month follow-up after discharge. She remained well at 1-year follow-up.

Discussion

This report highlights that SEA and psoas muscle abscess can be successfully treated with a medical regimen. In a patient with minimal neurological deficit or surgical contraindication, medical treatment may be considered as the gold standard for the treatment of SEA.

The usefulness of an invasive surgical approach for bacterial abscess of liver, brain and kidneys versus antimicrobial therapy alone has been debated [8]. The abscess size and causative organism may influence the outcome. Although there are reports of cases of sudden neurological deterioration developing within weeks to several months after an initial stable condition reached by medical treatment or even during medical management [9,10], medical management as an alternative approach for SEA patients with minimal or absence of neurological deficits, or medical contraindication for surgical decompression has been suggested [5,6,11]. A less invasive approach would be percutaneous drainage or computed tomography-guided needle aspiration, which may also play a role in improving the outcome [11,12].

Given the smaller subarachnoid space around the cervico-thoracic spine, cervico-thoracic SEA should be treated more aggressively than lumbar-sacral SEA [7]. However, possible complication of dura puncture and subsequent meningitis should be prevented and a relative contraindication is anterior located abscess, such as in our case [12]. It is important to be alert to poor prognostic features. These include thrombocytopenia (platelets $<100 \times 10^3/\text{mm}^3$), high erythrocyte sedimentation rate (110 mm/h), older age, thecal sac compression, septic presentation, and prolonged duration of symptoms [3,4,7,9]. The risk factors for relapse of SEA include immunocompromised condition and chronic medical illness. It is important to carefully evaluate the location and extension of the abscess, the immune status of the patient and the virulence of the organism [5].

In conclusion, patients with cervico-thoracic SEA, severe neurological deficits, or antibiotic-resistant bacteria, should be treated aggressively. Patients with SEA of minimal neurological deficit or surgical contraindications might be cautiously managed with conservative medical treatment alone, but close follow-up is necessary.

References

1. Havin ML, Kaminski HJ, Ross JS, Ganz E. Spinal epidural abscess: a ten-year perspective. *Neurosurgery*. 1990;27:177-84.
2. Nussbaum ES, Rigamonti D, Standiford H, Numaguchi Y, Wolf AL, Robinson WL. Spinal epidural abscess: a report of 40 cases and review. *Surg Neurol*. 1992;38:225-31.
3. Tang HJ, Lin HJ, Liu YC, Li CM. Spinal epidural abscess--experience with 46 patients and evaluation of prognostic factors. *J Infect*. 2002;45:76-81.
4. Davis DP, Wold RM, Patel RJ, Tran AJ, Tokhi RN, Chan TC, et al. The clinical presentation and impact of diagnostic delays on emergency department patients with spinal epidural abscess. *J Emerg Med*. 2004;26:285-91.
5. Bluman EM, Palumbo MA, Lucas PR. Spinal epidural abscess in adults. *J Am Acad Orthop Surg*. 2004;12:155-63.
6. Sampath P, Rigamonti D. Spinal epidural abscess: a review of epidemiology, diagnosis, and treatment. *J Spinal Disord*. 1999;12:89-93.
7. Rigamonti D, Liem L, Sampath P, Knoller N, Numaguchi Y, Schreiberman DL, et al. Spinal epidural abscess: contemporary trends in etiology, evaluation, and management. *Surg Neurol*. 1999;52:189-96.
8. Bamberger DM. Outcome of medical treatment of bacterial abscesses without therapeutic drainage: review of cases reported in the literature. *Clin Infect Dis*. 1996;23:592-603.
9. Khanna RK, Malik GM, Rock JP, Rosenblum ML. Spinal epidural abscess: evaluation of factors influencing outcome. *Neurosurgery*. 1996;39:958-64.
10. Harrington P, Millner PA, Veale D. Inappropriate medical management of spinal epidural abscess. *Ann Rheum Dis*. 2001;60:218-22.
11. Siddiq F, Chowfin A, Tight R, Sahnoun AE, Smego RA Jr. Medical vs surgical management of spinal epidural abscess. *Arch Intern Med*. 2004;164:2409-12.
12. Lyu RK, Chen CJ, Tang LM, Chen ST. Spinal epidural abscess successfully treated with percutaneous, computed tomography-guided, needle aspiration and parenteral antibiotic therapy: case report and review of the literature. *Neurosurgery*. 2002;51:509-12.