

# Two Children With Spinal Tuberculosis Associated With Psoas Abscess

## *Psoas Apsesinin Eşlik Ettiği Spinal Tüberkülozlu İki Çocuk Olgu*

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### Abstract

Pott disease is a well-known condition in developing countries causing multiple spinal deformities in children. The disease may be difficult to diagnose clinically because of its rarity, insidious onset and nonspecific clinical presentation. We report two pediatric cases of spinal tuberculosis. One was a 3-year-old girl who presented with a flank mass. Another, an 11-year-old boy, was admitted with thoracolumbar back pain and kyphosis. Magnetic resonance imaging (MRI) revealed a psoas abscess almost completely replacing the left psoas muscle in both patients. Computed tomography-guided needle biopsy of the vertebra and an aspiration of the psoas abscess, and other diagnostic testing for *Mycobacterium tuberculosis* were performed. Microbiology or histopathology of infected material confirmed the diagnosis of tuberculosis. Both patients underwent vertebral decompression and internal fixation. In conclusion, the diagnosis of spinal tuberculosis should be considered in patients with vertebral osteomyelitis, psoas abscess, and appropriate risk factors, such as a history of tuberculosis exposure.

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**Key words:** Spinal tuberculosis, psoas abscess, vertebral biopsy

### Özet

Pott hastalığı gelişmekte olan ülkelerde çocuklarda çoklu spinal deformitelerin nedeni olarak iyi bilinen bir durumdur. Hastalığın nadirliği, sinsi başlangıcı ve nonspesifik klinik tutulumu tanısında güçlükler neden olabilir. Burada biri sırt bölgesinde kitlesi olan üç yaşında kız, diğeri torakolomber ağrısı ve kifozu olan 11 yaşında erkek olmak üzere iki spinal tüberküloz olgusu sunuldu. İki hastada da manyetik rezonans görüntüleme (MRG) ile sol psoas kasının tamamını dolduran birer adet sol psoas apsesi belirlendi. Bilgisayarlı tomografi eşliğinde psoas apse aspirasyonu ve vertebra biyopsisi uygulandı, *Mycobacterium tuberculosis* için diğer tanısal testler yapıldı. İnfekte materyalin mikrobiyoloji ve histopatolojisi tüberküloz tanısını doğruladı. Her iki hastaya da vertebral dekompresyon ve internal fiksasyon yapıldı. Sonuç olarak, özellikle tüberküloz temas öyküsü olan, psoas apseli ve vertebral osteomyelitli hastalarda spinal tüberküloz düşünülmelidir. (*Çocuk Enf Derg* 2010; 4: 110-3)

**Anahtar kelimeler:** Spinal tüberküloz, psoas apsesi, vertebral biyopsi

### Introduction

*Mycobacterium tuberculosis* (*M. tuberculosis*) is a significant global health challenge. One third of the world's population is infected with *M. tuberculosis*, and 1.7 million people die from tuberculosis each year (1). Tuberculosis is primarily a pulmonary infection, but extra-pulmonary manifestations are not uncommon, especially in children and adolescents. Tuberculosis of the vertebral spine (Pott disease), whose

classical clinical presentation was defined in 1779 by Percival Pott, is the commonest presentation of tuberculosis of the bone (1-4).

The diagnosis of Pott disease is based on clinical presentation, radiographic evidence of spondylitis or spondylodiscitis, and identification of *M. tuberculosis* in aspirates or biopsy specimens of skeletal lesions (5).

We report imaging findings of two pediatric cases with extensive tuberculous spondylodiscitis accompanied by a psoas abscess.

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## Case Reports

### Case 1

A 3-year-old girl was admitted to hospital with a 1-month history of a progressively expanded swelling in the left lower lumbar region. Her medical history was unremarkable. On admission, her general condition was good and she was not febrile. Examination revealed a tender fluctuant mass, 8×10 cm in diameter, in the lumbar region. The respiratory, cardiovascular and neurological examinations were completely normal.

Laboratory evaluation showed a leukocytosis of 12,500/mm<sup>3</sup> with monocytes 11%, and an elevated level of C-reactive protein (CRP, 20.8 mg/dl; normal <3 mg/ml) and erythrocyte sedimentation rate (ESR, 52mm/h; normal <10mm/h). A chest radiograph was unremarkable. Abdominal sonography showed a huge retroperitoneal mass with subcutaneous extension to the left flank. Magnetic resonance imaging (MRI) and computed tomography (CT) of the abdomen revealed an abscess formation, almost completely replacing the left psoas muscle and displacing the left kidney (Fig 1a, 1b). In addition, there was a crescent-like paravertebral soft-tissue lesion (abscess) at the T11-L2 level (Fig 1c). The psoas abscess was drained at surgery and intravenous ceftriaxone, gentamycin and metronidazole were started. Drainage material was purulent, but microbiological examination of the abscess did not show any bacteria or acid-fast bacilli. This specimen was also inoculated to Lowenstein–Jensen culture medium.

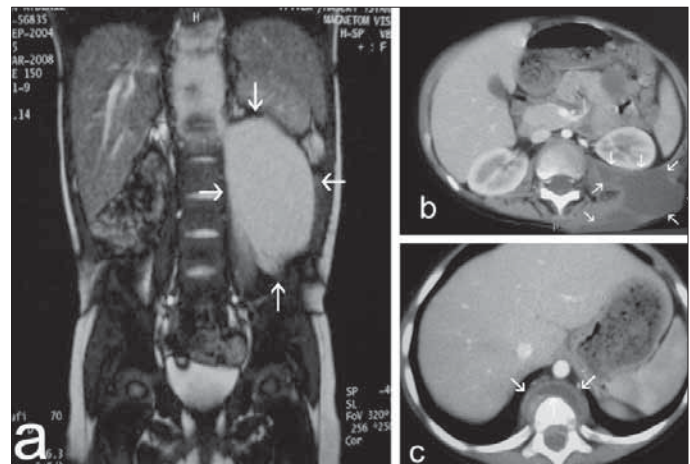
On the fifth day of antimicrobial therapy, the patient's temperature was elevated (39°C) and her general condition had deteriorated. On the seventh day, ESR and CRP were higher (65 mm/h and 70 mg/ml, respectively), so the antimicrobial treatment was changed to meropenem. Meanwhile, we found that her uncle's wife, who lived in the same house, was being treated for pulmonary tuberculosis. Her tuberculin skin test was 16 mm and a whole blood tuberculosis interferon gamma release assay (Quantiferon-TB Gold test) was positive. In view of the history of tuberculosis exposure, radiological images and lack of response to non-specific antimicrobial treatment for three weeks, she was prediagnosed as having spinal tuberculosis accompanied by psoas abscess. The patient was started on four antituberculosis medications, including isoniazid, rifampicin, ethambutol and pyrazinamide. Subsequently, *M. tuberculosis* was isolated from Lowenstein–Jensen culture medium of the abscess material on the 45th days of inoculation.

Unfortunately, after three weeks of the antituberculosis treatment, the MRI of the spine showed a severe vertebral body collapse of eleventh thoracic vertebra (Fig 2a, 2b). Paravertebral abscess formation was partly

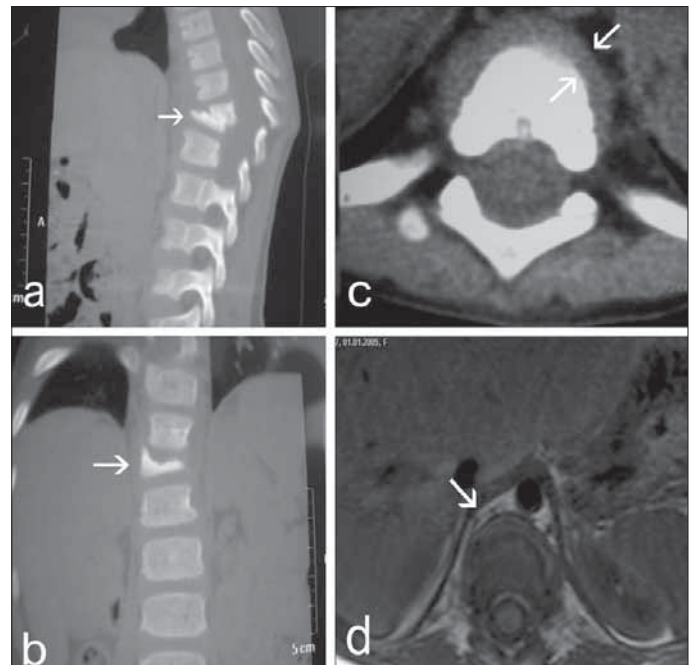
regressed, from 10 mm to 6 mm, on axial CT and MRI (Fig 2c, 2d). The patient was immediately referred to the Pediatric Neurosurgery Department for urgent anterior decompression and internal fixation operation. Her household members were referred to the National Association for the Prevention of Tuberculosis for a tuberculin skin test and further evaluation.

### Case 2

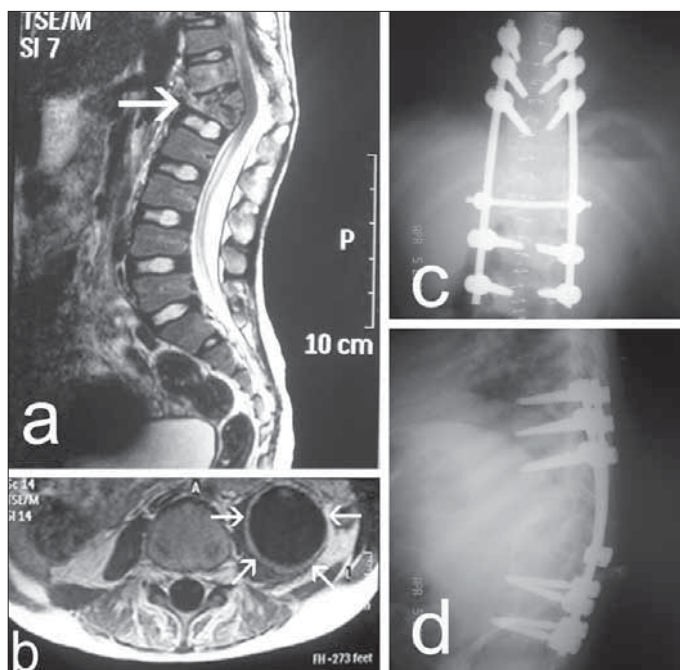
An 11-year-old boy was referred to our hospital with thoracolumbar back pain existing for six months. On



**Figure 1.** (a) Coronal MRI and (b) axial CT showing an abscess formation replacing the left psoas muscle and displacing the left kidney (c) Axial CT image revealing the crescent-like paravertebral soft-tissue abscess (10 mm) at the T11-L2 level



**Figure 2.** After three weeks of the antituberculosis treatment, (a) sagittal and (b) coronal MRI images of the spine show a severe vertebral body collapse of eleventh thoracic vertebra. (c) axial CT and (d) axial MRI images revealing a reduction in the crescent like abscess formation (6mm) at paravertebral space



**Figure 3.** (a) Sagittal MRI imaging of the thoracolumbar spine showing destruction of the T12-L1 intervertebral disc space, the collapsed vertebral body resulting in kyphosis and compression of the spinal cord. (b) Axial MRI image demonstrating a left psoas abscess. (c), (d) AP and lateral X-rays showing posterior instrumentation and fusion

admission, the patient appeared well with a temperature of 36.8°C. On examination, he had marked thoracolumbar kyphosis without neurological findings. Blood analysis showed an elevated level of CRP (39 mg/ml), elevated ESR (51 mm/h), and leukocytosis of 13,500/mm<sup>3</sup> with monocytes 13% and normocytic anemia consistent with chronic disease. His chest X-ray showed no intrapulmonary or mediastinal abnormalities.

MRI of the thoracolumbar spine revealed destruction of the T12-L1 intervertebral disc space as well as destruction of the vertebral bodies, resulting in kyphosis and compression of the spinal cord (Fig 3a). Axial image at T11-L1 level showed a cystic lesion, expanding and almost replacing the whole of the left psoas muscle (Fig 3b). A CT-guided needle biopsy of T12 vertebra and aspiration of psoas abscess were performed. Abscess material was purulent and its microbiological examination did not show acid-fast bacilli. Empiric therapy for vertebral osteomyelitis with vancomycin and ceftriaxone was initiated. However, histopathology of the vertebral tissue showed a granulomatous inflammation with caseification. The patient had a reactive tuberculin skin test (20 mm) and the T-spot. TB test (enzyme-linked immunospot assay) was positive. There had been no recent contact with any person with suspected or confirmed contagious tuberculosis disease. Nevertheless, his household members were referred to the National Association for the Prevention of Tuberculosis for a tuberculin skin test and further evaluation.

These findings were compatible with a diagnosis of spinal tuberculosis accompanied by a psoas abscess. The patient's antibiotic regimen was changed to isoniazid, rifampicin, ethambutol and pyrazinamide. He underwent posterior debridement, decompression and internal fixation (Fig 3c, 3d).

### Discussion

The incidence of tuberculosis is increasing in both developing and developed countries (2). Although the skeletal system is the most common extrapulmonary site for tuberculous infection in adult patients, tuberculosis of lymph nodes is the most frequent form in children (6). Skeletal tuberculosis is a late complication of tuberculosis and, although it has become a rare entity since antituberculosis therapy became available, it is more likely to occur in children than in adults. Spinal tuberculosis is the most common and serious form of tuberculosis lesions in the skeleton (7). Although clinical and radiological findings are clear in tuberculosis of the spine, making an early and definite diagnosis is not yet easy, because disease progression is slow and insidious. Due to this difficulty in the early diagnosis of the disease, several patients have received treatments like non-steroid anti-inflammatory drugs, physical therapy, a corset, etc., prior to correct diagnosis (3). Progressive local back pain for weeks to months, as in our second patient, is a common clinical presentation (8). Presentation with a flank mass due to psoas abscess is rare. The chronic and insidious nature of tuberculous spondylitis causes late diagnosis of this disease. Therefore, enough time passes for mass presentation of abscesses, which may be huge as in our first patient.

Psoas abscess can be classified as primary or secondary, depending on whether the infective source is identified (9). Secondary psoas abscess is usually due to gastrointestinal or urogenital system infections in developed countries. However, a significant cause of psoas abscess can be *M. tuberculosis* in developing countries, either from hematogenous seeding or direct spread from vertebral osteomyelitis of the lumbar spine.

Tuberculosis can involve the spinal column (spondylitis), the cord (myelitis, abscess, or granuloma), and its covering (arachnoiditis or extradural abscess). The typical radiographic appearance of spinal tuberculosis would include two or more adjacent vertebral bodies affected, with an associated loss of the intervertebral disc spaces and a possible paravertebral soft-tissue mass (2). Initially, our first patient had a psoas abscess and paravertebral abscess; then, severe vertebral body collapse and a kyphosis developed on medical treatment. However, our second patient presented with fully developed severe kyphosis, vertebral body collapse and psoas abscess.

A high index of clinical suspicion and an accurate history of possible tuberculosis exposure are essential to the diagnosis of skeletal tuberculosis. Although more than 90% of immunocompetent patients with skeletal tuberculosis have positive tuberculin skin testing, a current negative test should not exclude the consideration of *M. tuberculosis* in the differential diagnosis of vertebral osteomyelitis (8). Both our patients had reactive tuberculin skin tests.

Microscopy, culture and histopathology of infected material are recommended for the diagnosis of spinal tuberculosis (8). Needle aspiration and biopsy, preferably CT-guided, are advocated, and considered both sensitive and specific (8). This diagnostic approach yielded the diagnosis in both cases.

Therapeutic options include chemotherapy alone or in combination with surgery. Indications for surgery are neurological deficits, spinal instability, severe and progressive kyphosis, no response to chemotherapeutic treatment, non-diagnostic biopsy and large paraspinal abscess (4). In our two patients, we drained the abscess in the acute phase, both as a decompressive and a diagnostic intervention. In addition, both patients underwent vertebral decompression and internal fixation.

In conclusion, although spinal osteomyelitis with psoas abscess is classically associated with *Staphylococcus aureus* infection, Pott disease should be considered in the differential diagnosis, especially in developing countries. Microscopy, culture and histopathology of infected material are recommended to confirm the diagnosis. Antimicrobial therapy is the primary spinal tuberculosis treatment. However, adjuvant surgi-

cal treatment may be warranted in cases of neurologic involvement or medical treatment failure.

### Conflict of Interest

No conflict of interest is declared by the authors.

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