

## Case Report

# Bilateral Psoas Abscess: Atypical Presentation of Spinal Tuberculosis

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## Abstract

Three patients who came to the surgical outpatient department of 'Postgraduate Institute of Medical Education and Research', Chandigarh, India with features suggestive of acute abdomen are presented. On thorough evaluation, they had bilateral psoas abscess and on detailed investigations, tuberculosis was found to be the etiological factor. They were treated conservatively with good follow-up results. Psoas abscess may be clinically difficult to diagnose because of its rarity, insidious onset of the disease, and non-specific clinical presentation which can cause diagnostic delays resulting in high morbidity. Early diagnosis and appropriate management remains a challenge for clinicians. All three patients presented here have recovered following detailed investigation and appropriate management. The diagnosis of spinal tuberculosis should be considered in patients with vertebral osteomyelitis, psoas abscess, and appropriate risk factors such as a history of previous exposure in both developed and developing countries, as tuberculosis is re-emerging as an important etiological factor in spinal pathologies.

**Keywords:** Acute abdomen, atypical presentation, iliopsoas abscess, spinal tuberculosis

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## Introduction

Described by Pott in 1779, tuberculosis of the spine is a common entity encountered by orthopedic surgeons in tropical countries. Being so uncommon in other parts of world and with varied clinical presentations, spinal tuberculosis may pose diagnostic challenges and therapeutic dilemmas. It leads to significant morbidity and mortality in the young productive age group. Although psoas abscess due to spinal tuberculosis has been described, bilateral psoas abscess with varied presentation is rare, and it is considered worthwhile to present our experiences with three such cases treated in our hospital.

### Case 1

The patient was a 12-year-old female admitted to the emergency surgical outpatient department of 'Postgraduate Institute of Medical Education and Research', Chandigarh, India with complaints of abdominal pain, vomiting, fever, and malaise. She was apparently healthy 3 months prior to admission, when she began to complain of intermittent back pain for which she was treated with analgesics by a local doctor. Her symptoms subsided. For the past 3 weeks she had intermittent fever and had missed school due to abdominal pain. She was admitted as a case of acute abdomen and evaluated. The patient had tenderness in both iliac fossa, along with an ill-defined palpable mass in the left iliac fossa. She also had tenderness in the lower lumbar region. The patient weighed 24 kilograms, was anemic, and febrile with stable vitals. Her he-

moglobin was 7.2 gram/dL, white blood cell count 14,200 with predominant neutrophils, and an erythrocyte sedimentation rate (ESR) of 120 mm at 1 hour. Mantoux test was positive. Urinalysis ruled out the presence of a urinary tract infection. She was negative for HIV 1 and 2. Chest X-ray was normal and an ultrasonography of abdomen was performed. The Ultrasonogram picked up a hypoechoic collection with many internal echoes in both psoas muscles. She was started on broad spectrum empirical antibiotics for pyogenic psoas abscess. A lumbosacral radiograph revealed erosive changes in the fifth lumbar vertebra. An orthopedic surgeon was called for consultation and the patient underwent, a contrast enhanced CT scan, of abdomen and pelvis and MRI of the lumbosacral spine (Figures 1 and 2).

Contrast enhanced CT reported irregular lytic destruction of the fifth lumbar vertebra along with a large pre- and para-spinal collection that extended from the fourth lumbar vertebra to the third sacral vertebra. There was also a 10.4 × 4.2 cm septated enhancing lesion located in the left anterior perinephric space between the iliac and psoas muscles. Similarly, a 5.6 × 4.4 cm collection was located on the right side. Ultrasound-guided pigtail catheter drainage was performed on the left side and around 40 mL of purulent material was removed. The catheter was kept for 4 days and the total pus drained was about 70 mL. Aspirate was positive for acid-fast bacilli and also polymerase chain reaction for *Mycobacterium tuberculosis*. The patient was started on a middle path regimen with bed rest and antitubercular drugs that included isoniazid, rifampicin, and pyrazinamide. Acid-fast bacilli culture was also positive by 47 days. By 6 weeks she showed improvement in general condition and was mobilized with a brace from month 3. At the end of 8 months follow-up the patient had significantly improved, both symptomatically and functionally. Her ESR and CRP readings were normalized by then.

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**Figure 1.** MRI image showing destruction of L5-S1 end plates and large prevertebral collection in case 1.



**Figure 3.** T2-weighted image of case 2. Coronal image depicting bilateral psoas abscess.

### Case 2

Case 2 was a 23-year-old male who presented to the Surgical outpatient Department of "Postgraduate Institute of Medical Education and Research", Chandigarh, India with backache and vague abdominal pain for the previous 8 months. There was evening rise of temperature for the past 2 months and significant weight loss of about 6 kilograms. Night pain was present and the patient had contact a cousin brother who was under treatment for pulmonary tuberculosis. General examination revealed anemia and cachexia. The patient had diffused lower abdominal tenderness and guarding. There was tenderness with paraspinal spasm in the dorsolumbar region. His hemoglobin was 6.2 gram/dL. Neutrophils and lymphocytes were elevated in the differential count. ESR at one hour was 80 mm. Chest X-ray showed no abnormality. An ultrasound examination of abdomen revealed a hypoechoic collection with many internal echoes in both psoas muscles and radiography revealed reduction in the D12 and L1 disc spaces along with end plate changes. The patient was empirically treated for pyogenic psoas abscess with ceftriaxone, vancomycin, and metronidazole.

CT scan and MRI (Figures 3 and 4) were performed which revealed a 5.2 × 3.2 cm collection in the right psoas and 2.4 × 1.8 cm collection on the left side with destruction of the D12 and L1 vertebrae. Ultrasound-guided pig tail catheter drainage was performed on the right side and 20 mL of pus was removed. Catheter was removed after 2 days as there was no further discharge.



**Figure 2.** Coronal image showing signal intensities in both psoases indicating bilateral psoas abscess in case 1.



**Figure 4.** T1-weighted image of case 2. Coronal image showing bilateral psoas abscess.

The material was negative for bacteria and acid-fast bacilli on staining. He underwent CT-guided biopsy of the involved vertebrae, which revealed caseous necrosis and granuloma formation. Based on these findings he was started on anti-tuberculous treatment with a 4 drug regimen that included isoniazid, rifampicin, ethambutol, and pyrazinamide along with bed rest. Acid-fast culture was positive at the end of 6 weeks. The patient developed hepatotoxicity and was put on modified regimen of ethambutol, ciprofloxacin, and streptomycin. He was mobilized with a brace from the third month. At the 10 month follow-up he had improved significantly. Duration of therapy was prolonged for a year due to the modified regimen and stopped once CRP levels normalized.

### Case 3

A 40-year-old male presented with abdominal pain that radiated to his back along with intermittent fever for the past three weeks. He was admitted and subjected to routine hemogram, chest X-ray, ultrasound of the abdomen and pelvis, urine analysis, and an upright radiography of the abdomen. Ultrasound examination showed bilateral psoas masses. Radiography showed destruction of the L2-L3 endplates and reduction in the disc space. He had increased neutrophils and elevated ESR (140 mm at 1 hour). Empirical antibiotics were started and he underwent CT and MRI (Figures 5 and 6). Imaging studies were positive for 2 × 2 cm



Figure 5. T1-weighted image of case 3.



Figure 6. T2-weighted image of case 3.

and  $3 \times 2$  cm masses in the right and left psoas muscles. Ultrasound-guided pigtail catheter was introduced on the left side and a 5 mL purulent discharge was removed. Aspirate was negative for bacterial and acid-fast bacilli stains. Meanwhile, CT-guided biopsy was performed which confirmed tuberculosis. Acid-fast culture was positive at 6 weeks. The patient was started on a 4 drug antituberculous regimen and had significant improvement over a period of 6 months. Duration of therapy was extended for 9 months. At 3-years follow up, the patient has remained well except for occasional backache.

## Discussion

Tuberculosis is a known factor contributing to morbid spinal conditions in both developed and developing countries. Vertebral tuberculosis is the most common form of skeletal tuberculosis, which constitutes about 50% of all cases of tuberculosis of the bones and joints. However, its association with bilateral psoas abscess presenting as an acute abdomen is not common. Psoas abscess may be classified as primary or secondary depending on the presence or absence of the underlying disease. The peculiar anatomy of the psoas muscle and its fascia puts it in direct communication with the mediastinum and thigh. Since the muscle lies in proximity to viscera such as the sigmoid, appendix, jejunum, ureters, kidneys, pancreas, spine, and iliac lymph nodes, any underlying disease in these organs can result in secondary psoas abscess.<sup>1</sup> *Staphylococcus aureus* (88%) is considered to be the most common cause of primary psoas abscess followed by streptococci and *Escherichia coli*. The etiology of primary psoas abscess is unclear, but lymphatic and hematogenous spread of an infectious process from an occult source in the body, often associated with immunosuppression has been implicated.<sup>1</sup>

Ricci et al. have noted that the most common cause of secondary psoas abscess was Crohn's disease.<sup>2</sup> However, an important

cause of psoas abscess in developing countries can be *Mycobacterium tuberculosis*, spread by hematogenous or direct extension from lumbar spinal vertebral osteomyelitis.<sup>3,4</sup> Psoas abscess may be clinically difficult to diagnose because of its rarity, insidious onset, and non-specific clinical presentation which can cause diagnostic delays resulting in high morbidity. Early diagnosis and appropriate management remain a challenge for clinicians. All 3 patients in this case series presented with acute abdomen.

The classical triad of fever and limitation of hip joint movements, other than back pain may be present in only 35% of patients with psoas abscess.<sup>5</sup> Fever, weight loss, and constitutional symptoms are encountered in less than 40% of cases.<sup>6</sup> Progressive local back pain for weeks to months with or without associated muscle spasm and rigidity should prompt the clinician to suspect a spinal cause for the abscess. In general, laboratory testing is non-specific. ESR and C-reactive protein are generally elevated and may be useful in following the disease course.<sup>7</sup> Plain radiographs may reveal underlying discitis or vertebral osteomyelitis in chronic lesions but may not be of much help in differentiating pyogenic or tuberculous etiology.

Abdominal ultrasound may pick up hypoechoic lesions suggestive of psoas abscess in 60% of patients but may not be able to identify an underlying etiology.<sup>8</sup> MRI appears to have 90% sensitivity and 80% specificity for diagnosing psoas abscess. The gold standard imaging modality is intravenous contrast enhanced spiral CT.<sup>8,9</sup> However, MRI is better than CT at imaging the spinal canal and provides a more complete evaluation of the spinal pathology. Ultimately, definite diagnosis is achieved with drainage and analysis of pus or histopathological examination of specimens obtained by CT-guided biopsy.<sup>8</sup> All our patients had ultrasound-guided drainage and analysis of the abscess fluid. Only patient number 1 had acid-fast bacilli on staining, however all 3 had acid-fast bacilli grown on culture.

Histopathological examination of CT-guided biopsy specimens of patients 2 and 3 showed caseous necrosis and granuloma forma-



tion suggestive of tuberculosis. All patients were started on broad spectrum intravenous antibiotics that covered *Staphylococcus aureus* and once tuberculosis was confirmed, they were treated by the middle path regimen classically described by Tuli, et al.<sup>10</sup> As described by Tuli, the middle path regimen encompasses the treatment method where aggressive surgical therapy is not performed in all patients. The patients are managed with rest, modern antituberculous medicines, and spinal braces. Surgical treatment is performed only in selected patients.<sup>10</sup> Aspiration of abscesses have been performed for diagnostic purposes and not for therapy as we consider that the appropriate antituberculous treatment would be able to cause subsidence of abscesses without the need for surgical drainage. Surgical drainage is contemplated once there is a neurological deficit. Adjuvant surgery should be considered for patients with disease progression on therapy (medical treatment failure) or those who have spinal cord compression, neurological deficit or spinal instability.

The diagnosis of spinal tuberculosis should be considered in patients with vertebral osteomyelitis, psoas abscess, and appropriate risk factors. In both developed and developing countries it is re-emerging as an important etiological factor in spinal mostly due to immunosuppression of different etiologies. Unilateral presentation is more common and bilateral psoas abscess has been reported rarely in the literature.

#### Patient consent section

Written informed consent was obtained from the patients for publication of this case series and accompanying images. A copy of the written consent has been submitted to the journal.

#### Competing interests section

The author(s) declare that they have no competing interest.

#### Author's contribution section

Prof. Dr. B. R. Thapa was the one under whom our paediatric patient was admitted and Dr. Nirmal Raj, Dr. Sakthivel Rajan, and Dr. Vibhu Krishnan were the surgeons who managed these cases in the Outpatient Department and wards; all were treated under eminent guidance of the spine surgeon, Dr. Vijay Goni. Dr. Sameer Vyas was the interventional radiologist who helped us in drainage as well as collection of material for analysis.

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