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Case Report

A rare case of Pott's spine with bilateral psoas abscess and empyema: A manifestation of disseminated tuberculosis

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Abstract

This case report describes a rare presentation of disseminated tuberculosis (TB) in a 45-year-old male presented with lower backache and left arm pain for 1.5 months and progressive breathlessness for one month. Imaging revealed left-sided empyema, Pott's spine, bilateral psoas abscesses. Bilateral psoas abscess is an uncommon entity, and tuberculous etiology for such a presentation is even more rarely reported in immunocompetent individuals. High Adenosine Deaminase (ADA) levels in the psoas abscess pus, along with the clinical picture and radiological findings, strongly suggested tuberculous etiology despite negative Cartridge Based Nucleic Acid Amplification Test (CBNAAT) results, for which Anti-Tubercular Therapy (ATT) was started empirically. This led to significant clinical improvement and a reduction in abscess size. This case highlights the diagnostic complexity of disseminated TB, especially in atypical presentations with multi-organ involvement, and underscores the importance of high index of suspicion and comprehensive investigations and of early empirical treatment even in the absence of microbiological confirmation and supported by subsequent clinical improvement.

Keywords: Anti-tubercular therapy, Immunocompetence, EPTB, Multi-organ.

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1. Introduction

Tuberculosis (TB) persists as a leading challenge in global health efforts, particularly in high-burden countries like India. While pulmonary involvement is the most common manifestation, extrapulmonary and disseminated forms of TB continue to challenge timely diagnosis and management due to their atypical presentations and paucibacillary nature.[1,2]

Among the rare manifestations of disseminated TB, bilateral psoas abscesses are particularly uncommon and often mimic other bacterial infections or malignancies. Due to the deep anatomical location and nonspecific symptoms, diagnosis of psoas abscess secondary to TB is frequently delayed. Furthermore, negative microbiological tests such as CBNAAT or culture do not rule out TB, particularly in extrapulmonary sites, underscoring the need for a high index of clinical suspicion.[3,4]

In such scenarios, early empirical initiation of ATT, based on radiological findings, elevated adenosine deaminase (ADA) levels and the overall clinical picture, can be both diagnostic and life-saving, often resulting in rapid clinical improvement.

Extrapulmonary TB can manifest in various forms, including musculoskeletal, genitourinary, and neurological involvement.[2] Diagnosis can be challenging, especially in immunocompetent individuals, as atypical presentations and inconclusive initial investigations can delay appropriate treatment. This case highlights a rare and complex presentation of disseminated TB with bilateral psoas abscesses, empyema, and suspected Pott's spine in an immunocompetent adult.

2. Case Report

A 45-year-old male with a known history of poliomyelitis, presented to the orthopaedics outpatient department with

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complaints of persistent lower back pain for 1.5 months. During the course of evaluation, he also reported a one-month history of progressive breathlessness, without associated symptoms such as cough, fever, or chest pain. He denied any history of tuberculosis or other significant comorbidities.

A chest X-ray and subsequent CT (Computed Tomography) scan of the chest revealed a left-sided loculated pleural collection with a split pleura sign [**Figure 1,2**], suggestive of empyema. Ultrasonography (USG) of the thorax corroborated the findings, he was started on broad spectrum antibiotics and drainage of the abscess was established by 8.5 French pig tail catheter under ultrasonography guidance. After initial 50 ml drainage of thick, viscous and purulent material, there was no subsequent drainage, and he continued having fever. Repeat ultrasonography revealed a residual collection with thick internal septations, warranting need of Intrapleural Fibrinolytic Therapy (IPFT). Laboratory analysis of pleural fluid revealed a total leukocyte count exceeding 50,000cells/µL with neutrophilic predominance (85%), Glucose-8mg/dl, Protein-3.8gm%. Tuberculosis workup, including CBNAAT, AFB culture, and cytological examination for malignancy were negative. Initial culture reports were sterile. Follow-up cultures of pleural fluid grew Acinetobacter baumannii, superadded bacterial infection guiding targeted antimicrobial therapy was given.

Routine ultrasonography of the abdomen and pelvis, performed as part of a systemic evaluation, revealed a focal caliectasis in left kidney. Further evaluation as advised by urologist, including a CT abdomen and pelvis, revealed a significant left-sided psoas abscess extending into the iliacus muscle and left upper thigh, with a smaller collection noted in the right psoas muscle [**Figure 3**]. A pigtail catheter was inserted into the left lumbar psoas abscess, yielding approximately 250 mL of pus. Laboratory analysis of the aspirated fluid revealed elevated adenosine deaminase (ADA) level of 71.22 U/L, strongly suggestive of tuberculosis. However, Rampal et al. have suggested that higher ADA levels are observed predominantly in cold abscesses that are culture-positive for *Mycobacterium tuberculosis*, while lower levels may be encountered in culture-negative cases or in the presence of co-infections.[6] However, CBNAAT, AFB cultures and cytological examination were negative which may explain the diagnostic discordance.

Despite multiple courses of antibiotics, the patient showed no significant clinical improvement, raising suspicion for a disseminated infection of unknown etiology. Given the endemicity of tuberculosis in India and the overall clinical and radiological findings, empirical ATT was initiated, as per weight. Tablet HRZE: Isoniazid-300mg, Rifampicin-600mg, Pyrazinamide-1600mg, Ethambutol-1100mg) and duration (planned 9 months: 2 months intensive phase + 7 months continuation phase).

Following empirical ATT, the patient's condition gradually improved. Repeat CT imaging [**Figure 4**] of the abdomen and pelvis showed a significant reduction in the size of the left lumbar and psoas collections after drainage and therapy. Mild left pleural effusion with marked pleural thickening was also noted, consistent with resolving empyema. All subsequent cultures remained negative, likely due to the paucibacillary nature of the infection.

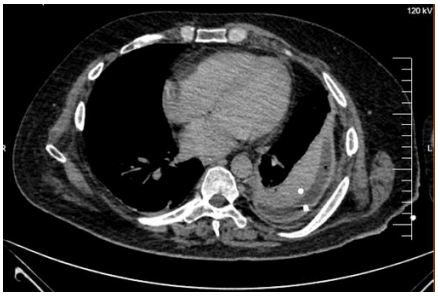

Figure 1: CT chest s/o left sided empyema with split pleura sign

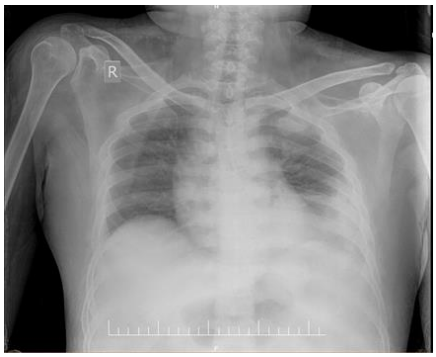

Figure 2: Chest radiograph

Figure 3: CT abdomen s/o B/L psoas abscess

Figure 4: CT abdomen s/o reduced size of B/L psoas abscess

The patient was managed under a multidisciplinary approach. Interventions included pleural drainage, psoas abscess drainage, targeted antimicrobial therapy, and anti-tubercular therapy. Gradual clinical improvement was observed with ongoing care, and repeat imaging confirmed resolution of the majority of collections following ATT.

3. Discussion

Disseminated TB is a progressive, life-threatening disease that results from lymphohematogenous dissemination of *Mycobacterium tuberculosis* bacilli due to either primary dissemination or progression from years of untreated TB. Disseminated TB accounts for up to 10–20% of extrapulmonary cases and often presents a diagnostic challenge due to its protean manifestations and the paucibacillary nature of extrapulmonary sites.[7]

Musculoskeletal involvement is seen in approximately 1–3% of all TB cases, with Pott's disease being the most common form. Psoas abscesses can occur secondary to Pott's spine, and while unilateral abscesses are more commonly documented, bilateral psoas abscesses are extremely rare, particularly in immunocompetent individuals.[7] The deep-seated location of the psoas muscles and the non-specific nature of symptoms, such as back pain, limp or malaise, contribute to diagnostic delays and frequent misdiagnosis as malignancy or pyogenic abscesses.[8] Psoas abscesses are usually confined to the iliopsoas compartment due to their fascial attachments. However, in rare situations, the infection can spread locally.[9]

Our patient presented primarily with lower back pain and left arm pain, without any significant respiratory symptoms. There was no history of cough, fever, weight loss, or night sweats, all features typically associated with active pulmonary or systemic TB. The initial presentation was deceptively benign, emphasizing that disseminated TB may manifest without classical constitutional or respiratory symptoms, especially in extrapulmonary forms. Despite the absence of these features, extensive imaging revealed pleural empyema, bilateral psoas abscesses, and spinal involvement, reflecting widespread dissemination. The diagnostic challenge was further compounded by the presence of bacterial coinfections.

Microbiological confirmation in extrapulmonary TB remains difficult, with tests such as CBNAAT often returning false negatives due to low bacillary load, even in multi-organ involvement. This limitation necessitates reliance on indirect markers such as elevated ADA levels, radiological findings, and clinical judgment to guide diagnosis and management.[10] The presence of multiple pus collections as bilateral psoas abscess, suspected Pott's spine, along with the radiological findings suggestive of disseminated disease, provided crucial clues for the diagnosis.

In this case, the diagnosis of TB was suggested by radiologic evidence of spondylodiscitis, bilateral psoas abscesses, and empyema, along with significantly elevated ADA levels in the aspirated pus. Though CBNAAT and cultures were negative, empirical ATT was initiated based on the overall clinicoradiological picture. The patient demonstrated a favorable response, with resolution of fever, reduction in abscess size, and overall clinical improvement. We acknowledge as a limitation that pleural biopsy or thoracoscopy, which could have further strengthened the diagnostic confirmation of tubercular etiology, was not performed. This was primarily because the patient showed significant clinical improvement after initiation of ATT, and a less invasive approach was therefore preferred.

To the best of our knowledge, there is no published case report describing simultaneous involvement of the Pott's disease, bilateral psoas abscesses, and pleural cavity in an immunocompetent individual. This constellation of findings represents a distinctly unusual and rare manifestation of disseminated tuberculosis. Atypical presentations, as seen in this case, can delay the initiation of appropriate treatment and increase the risk of complications. This case highlights the importance of maintaining a high index of suspicion for tuberculosis, even in the absence of typical respiratory or systemic symptoms, particularly when imaging reveals involvement of multiple organ systems.

Bilateral tubercular psoas abscess is an exceedingly rare manifestation of extrapulmonary tuberculosis, especially in immunocompetent individuals. This aligns with Goni et al. (2012), who reported bilateral psoas abscesses as an atypical presentation of spinal tuberculosis, emphasizing the diagnostic challenges in the absence of classical symptoms.[11] Miloudi et al. (2020) emphasised its exceptional nature and highlighted the critical role of imaging in assessing the extent and enabling early diagnosis.[12] Maron et al. (2006) similarly reported that such presentations can closely mimic intra-abdominal pathology, often leading to diagnostic delays unless a high index of suspicion is maintained, particularly in endemic regions.[13] More recently, Yadav et al. (2024) described a unique case of multidrug-resistant spinal tuberculosis with bilateral psoas, pre- and paravertebral abscesses in an immunocompetent adult, underscoring the clinical complexity and therapeutic challenges associated with such extensive involvement.[14]

While these reports describe various combinations of spinal and psoas involvement, our case stands out due to the concurrent presence of empyema, which is rarely documented in the same setting, further highlighting the extent of dissemination possible in TB even in immunocompetent individuals.

4. Conclusion

This case illustrates an exceptionally rare presentation of disseminated TB, with bilateral psoas abscesses and

empyema occurring concurrently in an immunocompetent host. Despite the absence of microbiological confirmation, empirical ATT initiation led to significant clinical, resolution of fever, and radiological improvement, thereby reinforcing the diagnosis. Empirical ATT may be lifesaving in high-burden regions like India, especially when supported by elevated ADA levels in relevant body fluids and imaging findings.

This case highlights the importance of maintaining strong clinical suspicion for TB in atypical presentations. Understanding that multiple bacterial co-infections do not rule out TB; Initiating empirical ATT when clinical and radiological evidence strongly suggest TB, even in the absence of microbiological confirmation. This report contributes to the growing literature on atypical presentations of disseminated TB.

5. Source of Funding

None.

6. Conflict of Interest

None.

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