Case Report

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Internal Medicine Section

Catheter Directed Streptokinase Therapy for Loculated Tubercular Psoas Abscess: A Case Report

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ABSTRACT

Psoas abscess is a known complication of musculoskeletal tuberculosis and may pose significant therapeutic challenges, particularly when loculated or associated with drug resistance. We present a case of a 33-year-old male with a history of decompression laminectomy for Pott's spine, who presented with fever and low back pain. Imaging revealed a loculated left psoas abscess. Microbiological evaluation confirmed rifampicin-resistant *Mycobacterium tuberculosis*, and the patient was initiated on a Multidrug-Resistant Tuberculosis (MDR-TB) regimen. Image-guided pigtail catheter drainage was performed. However, follow-up imaging demonstrated persistent loculated collection with minimal drain output. In view of inadequate response to conventional drainage, catheter-directed fibrinolytic therapy using streptokinase was administered in two cycles. This resulted in a significant increase in drainage output and subsequent radiological resolution of the abscess. The patient showed marked clinical improvement with resolution of symptoms, and the catheter was successfully removed. This case highlights the potential role of fibrinolytic therapy as a minimally invasive and cost-effective adjunct in the management of loculated tubercular psoas abscesses, particularly when conventional drainage is insufficient. It may help avoid surgical intervention in selected cases and offers a valuable therapeutic option in resource-limited settings.

Keywords: Fibrinolytic therapy, Multidrug-resistant tuberculosis, Musculoskeletal tuberculosis

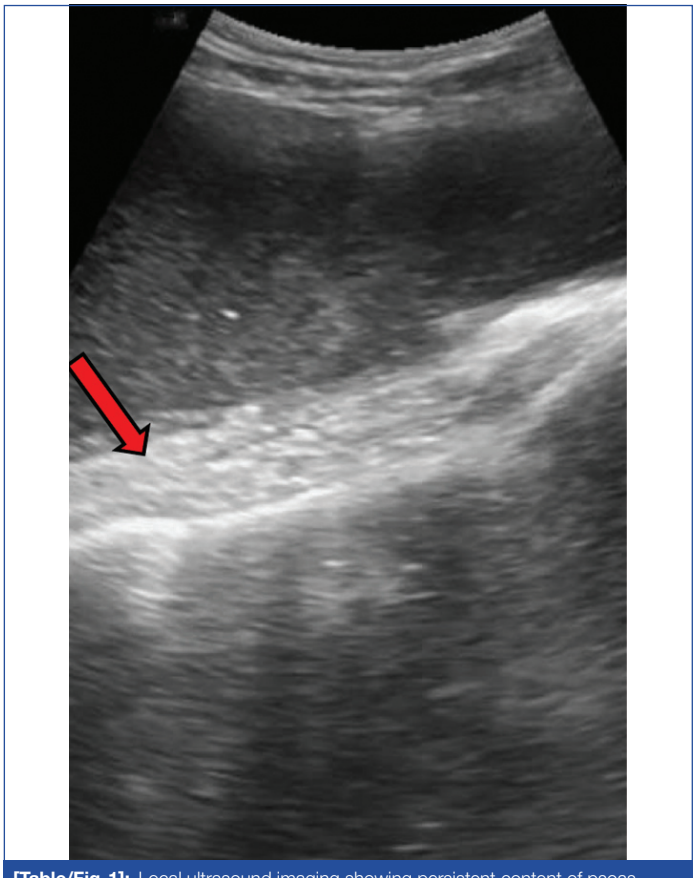
CASE REPORT

A 33-year-old male presented with complaints of low back pain and intermittent fever of two weeks duration. The pain was insidious in onset, dull aching in nature, localised to the lower back, and gradually progressive, with no radiation to the lower limbs. It was associated with intermittent low-grade fever and generalised malaise. There was no history of recent trauma. The patient had no known co-morbidities such as diabetes mellitus, hypertension, or immunosuppressive conditions. The patient had a significant past history of Pott's spine, for which he had undergone decompression and debridement laminectomy approximately six months prior to the current presentation. He had been initiated on anti-tubercular therapy postoperatively. However, treatment adherence was irregular.

On clinical examination, the patient was febrile with localised tenderness in the lumbar region. Laboratory investigations revealed elevated inflammatory markers (ESR: 52 mm/hr and CRP: 24mg/L), while routine haematological parameters were within acceptable limits. Radiological evaluation with ultrasonography and Magnetic Resonance Imaging (MRI) revealed a loculated collection in the left psoas muscle suggestive of a psoas abscess. Differential diagnoses considered included pyogenic psoas abscess and recurrence of tubercular infection.

Aspiration of the abscess was performed under imaging guidance, and the collected pus was sent for microbiological analysis. Cartridge-Based Nucleic Acid Amplification Test (CBNAAT) of both tissue biopsy and pus sample detected *Mycobacterium tuberculosis* with rifampicin resistance. Based on these findings, a diagnosis of MDR-TB with psoas abscess was made, and the patient was initiated on an appropriate oral longer regimen as per national guidelines - Levofloxacin 1000 mg OD, Bedaquiline 400 mg OD (weeks 1-2) then 200 mg TIW (weeks 3–24), Linezolid 600 mg OD (tapered to 300 mg after 6-8 months), Clofazimine 100 mg OD and Cycloserine 750 mg OD [1].

A pigtail catheter was inserted into the left psoas abscess under imaging guidance for drainage. Initial drainage yielded approximately 60 mL of purulent material. However, over the next 48 hours, the drain output reduced to less than 2 mL despite persistence of the collection on serial ultrasonography, suggesting loculated abscess content [Table/Fig-1].



[Table/Fig-1]: Local ultrasound imaging showing persistent content of psoas abscess of size 102×45×58 mm (CC×AP×TR) denoted by the red arrow.

In view of inadequate drainage, catheter-directed fibrinolytic therapy was planned. Streptokinase was administered through the pigtail catheter in two cycles, each consisting of three doses given at 8-hour intervals. Each dose was prepared by diluting inj. Streptokinase 1,500,000 IU (1.5×10^6 IU) 5 mL normal saline and each dose consists of 0.9 mL diluted streptokinase with 59 mL N.S instilled through the catheter, followed by clamping for two hours.

Following fibrinolytic therapy, there was a significant increase in drain output, with a total of 168 mL of fluid drained (This represents the net purulent abscess content evacuated; the instilled saline vehicle was not separately accounted for in the drain output measurement). The patient showed marked clinical improvement with reduction in pain and resolution of fever. The instillation was well tolerated with no immediate or delayed complications; coagulation parameters and platelet counts remained stable throughout, and no episodes of haemorrhage, allergic reaction, or catheter-related adverse events were observed. The catheter was removed 48 hours after repeat ultrasound showed significant reduction in content of the abscess cavity. Follow-up ultrasonography after three months demonstrated near-complete resolution of the abscess cavity [Table/Fig-2].

[Table/Fig-2]: Local ultrasound imaging post fibrinolytic therapy showing significant resolution of the psoas abscess (Yellow arrow).

Subsequently, the pigtail catheter was removed, and the patient was continued on MDR-TB treatment. On follow-up after three months, the patient remained clinically stable with no recurrence of symptoms.

DISCUSSION

Psoas abscess is an uncommon but well-recognised complication of spinal tuberculosis (Pott's disease), arising from contiguous spread of mycobacterial infection along the psoas muscle sheath [2,3]. The condition is further complicated by loculation, wherein fibrin deposition and septation within the abscess cavity impede effective drainage through conventional image-guided techniques [4]. The pathophysiology of loculation is driven by the host inflammatory response to mycobacterial antigens, which promotes fibrin cross-linking and the formation of internal septae, effectively compartmentalising the abscess and rendering standard pigtail catheter drainage insufficient [5,6]. In the present case, despite initial drainage of approximately 60 mL of purulent material following pigtail catheter insertion, output rapidly declined to less than 2 mL over 48 hours, with persistent collection on serial ultrasonography, a pattern consistent with established loculation. This clinical scenario underscores the need for adjunctive strategies beyond conventional drainage in selected patients with tubercular psoas abscess.

The use of intrapleural fibrinolytic therapy for loculated pleural effusions and empyemas is well established in the literature, with randomised controlled trials and systematic reviews demonstrating improved drainage outcomes and reduced need for surgical intervention [7,8]. The therapeutic rationale lies in the ability of fibrinolytic agents to lyse fibrin clots and break down septations within the cavity, thereby restoring catheter patency and facilitating fluid evacuation. Extrapolating this principle to extrapulmonary loculated collections, several published reports [5,6] documented successful resolution of loculated abscess cavities using fibrinolytics, demonstrating the feasibility of this approach beyond the pleural space. Shenoy-Bhangle AS and Gervais DA further reviewed the use of fibrinolytics in abdominal and pleural collections, reinforcing the mechanistic validity of this technique across anatomical compartments [8]. In the context of tubercular psoas abscess, the thick, viscous nature of the purulent material, combined with fibrin-mediated loculation, makes fibrinolytic therapy a particularly rational adjunct to catheter drainage.

In the present case, streptokinase was chosen as the fibrinolytic agent on account of its availability, established safety profile, and low cost, considerations of particular relevance in resource-limited settings [9,10]. The drug was administered in two cycles of three doses each at 8-hour intervals, instilled through the in-situ pigtail catheter and clamped for two hours to maximise contact time with the loculated collection. This approach resulted in a significant increase in drainage output, with a total of 168 mL of fluid evacuated following fibrinolytic therapy, and near-complete radiological resolution of the abscess on follow-up ultrasonography. The added complexity in this case was the concurrent diagnosis of rifampicin-resistant *Mycobacterium tuberculosis* confirmed on CBNAAT, necessitating initiation of an oral longer MDR-TB regimen in accordance with national guidelines [11]. Drug-resistant tuberculosis is increasingly encountered in clinical practice and represents a significant therapeutic challenge, particularly in patients with extrapulmonary manifestations such as psoas abscess [12]. The concurrent administration of fibrinolytic therapy and an appropriate antimicrobial regimen appears to have been central to the favourable outcome observed in this case.

Compared to surgical alternatives such as open drainage or debridement, fibrinolytic therapy confers several important advantages. It is minimally invasive, circumventing the need for general anaesthesia and operative intervention, and is associated with reduced procedure-related morbidity [9,10]. The technique is straightforward to implement, requiring only instillation of the fibrinolytic agent through an existing catheter with a defined dwell time, and can be performed at the bedside without specialised infrastructure. This simplicity of administration is especially advantageous in patients who are haemodynamically vulnerable or those in whom surgery carries unacceptably high-risk. Patient acceptance and compliance are generally high given the non operative nature of the intervention, and the technique does not preclude subsequent surgical management [4]. Furthermore, streptokinase and other fibrinolytic agents are relatively inexpensive and widely available, making this approach accessible in low and middle-income country settings where surgical expertise or facilities may be limited [9]. In the present case, fibrinolytic therapy successfully avoided the need for surgical intervention in a patient with MDR-TB who was already on a prolonged and complex antimicrobial regimen.

While catheter-directed fibrinolytic therapy represents a promising adjunct in the management of loculated tubercular psoas abscess, several considerations warrant attention. Careful patient selection is essential; surgical intervention remains indicated in cases

complicated by spinal cord compression, vascular erosion, or abscess extension requiring decompression that cannot be achieved percutaneously [3,6]. The optimal fibrinolytic agent, dosing regimen, dwell time, and total number of instillation cycles have not yet been standardised, and current practice is largely guided by case reports and extrapolation from pleural space data [5,7]. Potential complications, including haemorrhage, sepsis, and catheter-related adverse events, must be anticipated and monitored, particularly in immunocompromised or malnourished patients with MDR-TB [10,12]. Haemorrhage remains the most clinically significant concern, arising from systemic fibrinolytic activity or erosion of adjacent vascular structures, and mandates careful patient screening with exclusion of known coagulopathy, recent surgery, or active bleeding. Local complications such as catheter occlusion, pain during instillation, and transient fever following streptokinase administration have also been reported. Streptokinase, being a bacterial-derived antigen, carries an additional risk of allergic or anaphylactic reactions, particularly in patients with prior streptococcal exposure or previous streptokinase use, necessitating vigilance during and after instillation. Inadvertent dissemination of infection through disruption of the abscess wall, though rare, is a theoretical concern, particularly in MDR-TB where organism containment is critical. Nonetheless, the present case adds to the growing body of evidence supporting the use of fibrinolytic therapy as a safe, effective, and resource-appropriate strategy for the management of loculated tubercular psoas abscesses when conventional drainage is inadequate. Prospective studies and standardised reporting of such cases will be essential to define optimal protocols and establish evidence-based guidelines for this indication.

CONCLUSION(S)

This case illustrates that catheter-directed fibrinolytic therapy with streptokinase is a viable and effective adjunct in the management of loculated tubercular psoas abscesses when conventional image-guided drainage proves inadequate. Several key points emerge from this case. First, loculation should be anticipated early in tubercular psoas abscesses, and failure of drain output despite persistent collection on imaging should prompt consideration of fibrinolytic therapy rather than prolonged watchful waiting. Second, streptokinase offers a cost-effective and widely available option, making this approach particularly relevant in resource-limited settings where surgical infrastructure may be constrained. Third, concurrent MDR-TB does not preclude the use of fibrinolytic therapy, provided an appropriate antimicrobial regimen is in place. Finally, careful patient selection remains essential, with surgical intervention reserved for cases involving spinal cord compromise or vascular involvement.

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