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Review Article

MRSA PSOAS Abscess with Spondylodiscitis with MRSA Bacteremia: A Case Report

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ABSTRACT

Methicillin-resistant Staphylococcus aureus (MRSA) is a notorious, virulent, opportunistic pathogen known for its resistance to multiple antibiotics and its ability to cause severe systemic infections. Among the less common but highly serious complications of MRSA infection are psoas abscess and spondylodiscitis, both of which may occur as a result of hematogenous spread from a primary bacteremic focus. A 63 years old male patient came with the complaints of lower back pain for two months and which was radiating to right lower limb. He has the past medical history of type2 DM. Laboratory investigations shows elevation in inflammatory markers and positive blood cultures for MRSA. Magnetic resonance imaging (MRI) of the spine and abdomen showed evidence of a psoas abscess extending into the lumbar vertebral region, with associated spondylodiscitis. The patient was managed with intravenous teicoplanin, image-guided abscess drainage and laminectomy L1- L2 was done. A multidisciplinary approach, involving infectious disease specialists, urologists, and spine surgeons, was essential for optimal recovery.

INTRODUCTION

MRSA is a highly virulent and antibiotic-resistant strain of Staphylococcus aureus, which is a leading cause of bacteremia and can result in widespread dissemination of infection to various organ systems, especially in immunocompromised or elderly patients. Psoas abscess and spondylodiscitis are the rare but serious complications of MRSA bacteremia.

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A psoas abscess is an accumulation of purulent material within the iliopsoas muscle compartment. They are classified as either primary or secondary based on the presence or absence of underlying diseases. The primary psoas abscess is caused due to hematogenous spread and is commonly caused by S. aureus and secondary psoas abscess is caused by the spread of infection from gastrointestinal diseases. Computed tomography (CT) and MRI are preferred for the diagnosis of psoas abscess.

Spondylodiscitis, the concurrent infection of vertebral bodies and intervertebral discs, is another rare but life-threatening condition. MRSA-related spondylodiscitis is associated with rapid progression and can lead to spinal instability, epidural abscess, or neurological compromise if not promptly diagnosed and managed. The coexistence of MRSA bacteremia, psoas abscess, and spondylodiscitis represents a severe clinical triad indicating disseminated infection. Predisposing risk factors may include advanced age, diabetes mellitus, immunosuppression, indwelling catheters, recent surgeries, or urogenital abnormalities.

Timely diagnosis requires a high index of suspicion, especially in patients with persistent fever, localized back pain, or signs of systemic toxicity. Diagnostic modalities such as MRI and CT are critical for detecting soft tissue and spinal involvement, while blood cultures and image-guided aspiration help confirm microbial etiology. Empirical antibiotic therapy must be initiated promptly, typically with agents active against MRSA such as vancomycin or linezolid, and adjusted based on culture sensitivity results.

This case highlights the importance of early recognition and aggressive management of complex MRSA infections involving the musculoskeletal system and bloodstream. It underscores the need for a multidisciplinary approach involving infectious disease specialists, radiologists, orthopedic or spine surgeons, and urologists to prevent long-term sequelae and optimize patient outcomes.

CASE PRESENTATION:

A 63-year-old male, presented with complaints of persistent low back pain for the past two months, which was radiating to the right lower limb. He was a known case of type 2 diabetes mellitus, on regular treatment. At the time of presentation the patient was conscious, afebrile, and hemodynamically stable with a blood pressure of 130/70 mmHg. Cardiovascular examination was unremarkable with normal heart sounds, and no neurological deficits were observed.

Initial blood investigations revealed elevated inflammatory markers, including a WBC count of 12,500/mm^3, ESR of 100 mm/hr, and CRP of 211 mg/L. The haemoglobin levels fluctuated between 9.5 to 10.7 g/dL during his hospital stay. Liver function tests showed a transient elevation in bilirubin and transaminases on the third day of admission, which normalized with supportive care. Electrolytes showed episodes of hyponatremia, and serum albumin levels declined transiently, reflecting a systemic inflammatory response.

Magnetic resonance imaging (MRI) of the lumbosacral spine with contrast revealed spondylodiscitis involving L1–L2 vertebrae, associated with bone marrow edema, endplate erosion and intervening disc destruction. A small anterior epidural abscess was noted at the same level, causing spinal canal stenosis and compression of the conus medullaris. Bilateral psoas abscesses, more prominent on the right side, extended into the aorticaval space with anterior indentation on the right kidney. Imaging findings were suggestive of either tubercular or pyogenic

infection. However, subsequent molecular and microbiological evaluations ruled out tuberculosis. AFB staining and TRUENAT MTB PCR on pus samples were negative, and culture of the drained pus was sterile.

Meanwhile, blood cultures taken on the third day of admission grew Staphylococcus aureus, which was resistant to oxacillin and multiple other antibiotics, confirming methicillin-resistant Staphylococcus aureus (MRSA) bacteremia. The isolated organism was sensitive to linezolid, vancomycin, teicoplanin, clindamycin, tetracycline, and trimethoprim/sulfamethoxazole.

Given the extent of spinal involvement and the presence of an epidural abscess, the patient was taken up for surgical decompression. A laminectomy at L1–L2 was performed on fifth day. Post-operatively, he was started on intravenous teicoplanin 600 mg, administered twice daily for the first two days, then once daily from the third day onward. The total duration of intravenous teicoplanin was planned for six weeks. He had also received intravenous meropenem and doxycycline for three days initially while awaiting culture sensitivity results. Additional supportive medications included Inj. Tramadol and Tab. Aceclofenac-Paracetamol for pain relief, Tab. Gabapentin for neuropathic pain, Tab. Natrise for sodium correction, and Tab. Tamsulosin-dutasteride combination for his underlying benign prostatic hyperplasia (confirmed by PSA level of 26.8 ng/mL and imaging evidence of prostatomegaly with grade II intravesical extension).

During the hospital course, the patient remained afebrile and showed clinical improvement in pain and mobility. Inflammatory markers gradually declined with a CRP of 39.7 mg/L and ESR dropping to 46 mm/hr by discharge. No new neurological deficits were noted, and the surgical wound remained clean and healing. He was discharged on fourteenth day in stable condition with advice to continue intravenous teicoplanin for six weeks along with oral medications including Tab. Gabapentin, Tab. Mirabegron, Tab. Tamsulosin-dutasteride, Tab. Tizanidine, and a proton pump inhibitor. The patient was advised for outpatient follow-up with repeat inflammatory markers and imaging to assess resolution of infection.

DISCUSSION

Psoas abscess is an uncommon but serious condition that can present either primarily due to hematogenous spread or secondarily from adjacent infectious sources. Spondylodiscitis, when co-existing, adds to the complexity and morbidity of the disease. In this case, the patient presented with bilateral psoas abscesses, spondylodiscitis at L1–L2, and MRSA bacteremia—a rare but increasingly reported clinical scenario, especially in immunocompromised individuals such as diabetics.

Traditionally, Staphylococcus aureus has been reported as the most common causative organism in pyogenic spondylodiscitis and psoas abscesses, accounting for up to 88% in some series.[1] However, MRSA, a more resistant and virulent strain, is less frequently seen but is associated with worse outcomes due to its ability to cause hematogenous dissemination and poor response to empirical antibiotics. In a retrospective analysis by Schmitz et al. (2005), MRSA accounted for around 20–30% of S. aureus-related osteomyelitis cases, often in patients with comorbidities like diabetes, renal insufficiency, or prior hospitalization.[2] Similarly, our patient had uncontrolled diabetes and evidence of atherosclerotic vascular disease, which could have facilitated bacterial seeding.

MRI remains the gold standard in diagnosing spondylodiscitis and psoas abscess. The characteristic findings in tuberculous spondylitis—such as subligamentous spread, multilevel involvement, and well-defined abscesses—were present in our case, raising an initial suspicion for Mycobacterium tuberculosis. However, negative AFB smear, sterile pus culture, and negative TRUENAT PCR, combined with positive blood culture for MRSA, supported the diagnosis of pyogenic origin. Similar diagnostic dilemmas have been documented by Cheung et al. (2006) and Lee et al. (2012), who emphasized the need for comprehensive microbiologic confirmation before starting anti-tuberculous therapy in endemic regions.[3-4]

Surgical intervention is generally recommended when there is neurological compromise, spinal instability, or failure of conservative therapy. In our case, laminectomy at L1–L2 was performed due to spinal canal stenosis and conus medullaris compression, with favorable post-operative recovery. In line with this, a review by Tali ET (2004) suggested that early surgical decompression along with culture-specific antibiotics is critical in preventing permanent neurological deficits.[5]

Treatment of MRSA infections requires prolonged intravenous antibiotics with good bone penetration. Teicoplanin was used for the treatment of this patient which demonstrated comparable efficacy to vancomycin with fewer nephrotoxic effects, making it a suitable long-term therapy for osteoarticular infections.[6] Linezolid and daptomycin are other alternatives, particularly in resistant or intolerant cases. Current IDSA guidelines recommend a minimum of 6 weeks of IV antibiotics for vertebral osteomyelitis caused by MRSA.[7]

Compared to previously published case reports, this case stands out due to the simultaneous presence of bilateral psoas abscesses, MRSA spondylodiscitis, and bacteremia, with negative local cultures and tuberculosis ruled out. In a study by Kim et al. (2015), only 1 out of 38 patients with psoas abscess had MRSA, and most required image-guided drainage.[8] For this patient, surgical decompression was prioritized due to epidural extension and conus compression.

FUTURE DIRECTIONS:

Future research should focus on:

- Development of rapid multiplex PCR panels for simultaneous detection of tubercular and pyogenic organisms in spinal tissue.
- Artificial intelligence-based imaging analysis to distinguish between TB and pyogenic spinal infections early.
- Exploring the use of long-acting injectable antibiotics in reducing hospital stay for osteomyelitis and deep abscesses.
- Moreover, this case reinforces the value of personalized antibiotic regimens, especially in the context of emerging multidrug resistance. Integration of infectious disease specialists in multidisciplinary teams for early and appropriate intervention can significantly improve outcomes.

CONCLUSION:

This case underscores the clinical complexity of MRSA psoas abscess with spondylodiscitis and bacteremia, particularly in an immunocompromised patient with diabetes. It highlights the importance of a high index of suspicion, prompt imaging with MRI, and comprehensive microbiological evaluation to differentiate between pyogenic and tubercular etiologies. Early surgical intervention, combined

with targeted intravenous antibiotic therapy, plays a pivotal role in achieving favorable outcomes. Given the rising incidence of multidrug-resistant organisms like MRSA, individualized and evidence-based treatment strategies remain essential. This case also emphasizes the need for continued research into rapid diagnostic tools and long-acting antimicrobials to improve management and prognosis in deep-seated musculoskeletal infections.

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