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UNCOMMON PRESENTATION: MYCOBACTERIUM ABSCESSUS IN POTT'S DISEASE

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Abstract – *Background:* Nontuberculous mycobacteria (NTM) are emerging pathogens associated with diverse infections. Among them, Mycobacterium abscessus is a rapidly growing, multidrug-resistant species with notoriously poor treatment outcomes. Vertebral osteomyelitis due to NTM remains rare, often leading to diagnostic delay and mismanagement.
Case Report: We report the case of a 65-year-old Indian male presenting with chronic back pain, weight loss, and subsequent spinal instability. Despite empirical anti-tubercular therapy for presumed Pott's disease, the patient developed persistent discharging sinuses and worsening spinal involvement. Cultures eventually identified M. abscessus, with drug susceptibility testing guiding a multidrug regimen of intravenous and oral agents. Clinical improvement was achieved with a multidisciplinary approach.
Conclusions: This case underscores the diagnostic challenges of NTM spinal infections, the therapeutic difficulties due to drug resistance and adverse effects, and the urgent need for NTM-specific management protocols in tuberculosis-endemic countries.

Keywords: Nontuberculous mycobacteria, *Mycobacterium abscessus*, Pott's disease, vertebral osteomyelitis, spinal infection.

INTRODUCTION

Nontuberculous mycobacteria (NTM) are free-living pathogens increasingly recognized as significant human pathogens. They are resistant to disinfectants, hydrophobic in nature, and ubiquitous in the environment, being detected in water, soil, animals, milk, and food products[1]. Over 150 species are identified, with *Mycobacterium avium complex*, *M. fortuitum*, and *M. kansasii* being most common[1,2].

Mycobacterium abscessus complex is a rapidly growing, multidrug-resistant NTM, classified into three subspecies (abscessus, massiliense, and bolletii)[3]. Differences in the *erm*(41) gene confer varying degrees of resistance, particularly to macrolides[4]. Although NTMs usually cause pulmonary disease, vertebral osteomyelitis due to *M. abscessus* is exceptionally rare[5].

We present a case of Pott's spine caused by *M. abscessus* in an immunocompetent adult, successfully managed through multidisciplinary care.

CASE PRESENTATION

A 65-year-old male farmer from northern India presented at the hospital with progressive lower back pain and difficulty walking for three years, accompanied by weight loss. Pain was intermittent, severe, non-radiating, and aggravated by movement. He had no comorbidities. Examination revealed stable vitals, preserved tone, reduced motor power (grade 2) in both lower limbs, and no sensory deficits. MRI spine showed destruction of D11-D12 vertebrae and intervertebral disc damage, suggestive of Pott's spine (Figure 1). Anti-tubercular therapy (ATT) was initiated. After six months, symptoms persisted. Repeated MRI revealed vertebral collapse with epidural and paravertebral collections, causing canal stenosis. Posterior decompression with stabilization was performed (Figure 2).

Figure 1. A Pre-Op T2/STIR sagittal MRI reveals a well-defined high intensity collection in prevertebral space and a diffuse high intensity lesion noted in vertebral body suggestive of bone marrow edema.

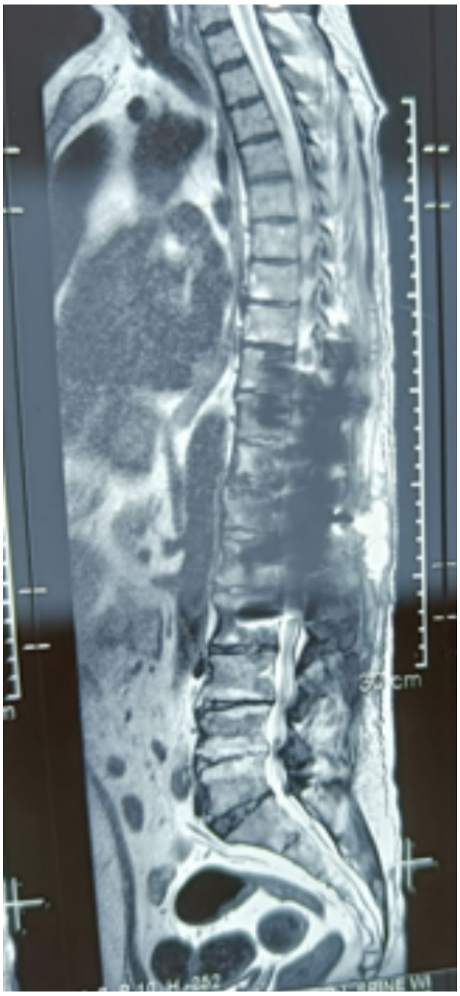

Figure 2. A post-op T2/STIR sagittal MRI revealing post implant artifacts with resolved bone marrow edema and a well-defined collection in the subcutaneous plane.

Histopathology showed granulomas; AFB staining was positive; GeneXpert was negative for *M. tuberculosis*; pyogenic culture was sterile. ATT was continued. Four months later, discharging sinuses developed. Despite debridement and addition of streptomycin, recurrence occurred. Pulmonology consultation advised sinusectomy. Samples processed for smear, culture, histopathology, and MGIT showed AFB positivity and growth of *M. abscessus*. Drug susceptibility revealed sensitivity to amikacin, ciprofloxacin, clarithromycin, imipenem, linezolid, moxifloxacin, tigecycline, and tobramycin, but resistance to amoxicillin-clavulanate, cefoxitin, ceftriaxone, cefepime, doxycycline, minocycline, and co-trimoxazole.

A regimen of intravenous imipenem, amikacin, and tigecycline, with oral clarithromycin, linezolid, and clofazimine, was initiated for six months (tigecycline later discontinued). Despite adverse events (anemia, hearing loss, hyperpigmentation), clinical improvement was achieved with close monitoring and supplementation.

DISCUSSION

Spinal tuberculosis (Pott's disease) remains a major health concern in India, comprising ~2% of all TB cases[6]. However, atypical mycobacteria such as *M. abscessus* may mimic TB clinically and radiologically, leading to inappropriate ATT and delayed correct diagnosis.

Environmental exposure to NTMs is common, with higher prevalence in water systems. Interestingly, Mycobacteria could be isolated from 24% of the indoor samples while only 3% of the outdoor samples yielded Mycobacteria isolates[7]. While another study reported that 60% of the tap water samples of private houses were positive for mycobacteria and a higher percentage (73%) was detected in hospital water samples[8].

Figure 3. Post-operative sinuses in the healing phase.

In this case, persistent symptoms, repeated AFB positivity, and poor response to ATT raised suspicion for NTM, confirmed by culture. Liquid culture remains the reference standard, but rapid molecular methods like Line Probe Assays offer earlier identification. It has been determined that the Geno Type Mycobacterium Common Mycobacteria/Additional species assay is a precise and reliable technique for identifying mycobacterial species[9]. Treatment of *M. abscessus* infections is challenging due to intrinsic resistance[10]. Cefoxitin, amikacin, clarithromycin, and clofazimine have been reported in successful regimens[11]. BTS guidelines recommend initial intravenous therapy followed by oral and inhaled agents, tailored by susceptibility.

Our case highlights the absence of NTM-specific protocols under the Indian NTEP, necessitating reliance on international guidelines. Genetic testing for *erm*(41) mutations was not performed, but clarithromycin susceptibility was reassuring. Treatment required multiple agents, intensive monitoring, and patient education due to adverse effects, consistent with reports documenting >90% side-effect incidence.

Another major challenge encountered was the lack of a standardized protocol under the National Tuberculosis Elimination Program (NTEP) in India for the diagnosis and management of NTM infections. Neither specialized testing facilities nor drug procurement pathways for NTM were available in our setting, a limitation also highlighted in previous Indian studies[9]. In the absence of national guidelines, therapeutic decisions were made based on recommendations from the British Thoracic Society (BTS) and the Infectious Diseases Society of America (IDSA), which emphasize individualized regimens, multidisciplinary care, and the use of macrolide-based combination therapy for complex cases[6,12,13].

CONCLUSIONS

This case demonstrates that *M. abscessus* should be considered in spinal infections unresponsive to ATT. Culture and drug susceptibility testing are essential for accurate diagnosis and management. A multidisciplinary approach is crucial, given the complexity and toxicity of therapy.

India urgently requires NTM-specific diagnostic facilities and treatment guidelines to address the rising burden of NTM infections. Clinicians should document and report such cases to strengthen evidence and inform policy.

Conflict of Interest

The authors declare they have no conflict of interest.

Funding

None.

Ethics Approval

The research was carried out following approval from the institute's Research and Ethics Committee of School of Medical Sciences and Research, Sharda University and following Helsinki Declaration.

Informed Consent

Informed consent for publication, including accompanying figures, was obtained from the patient in accordance with ethical guidelines.

AI Disclosure

No generative AI technologies, such as Large Language Models and text-to-image genera- tors have been used during writing of this manuscript.

Author's Contributions

H. Mehdi Rizvi, D. Kumar : Conceptualization, Data Collection, L. Singh, F. Haider, H. Mehdi Rizvi, D. Kumar : Literature Review, Manuscript Writing, L. Singh, F. Haider: Manuscript editing, Validation and Final Review; all authors issued final agreement for the version to be submitted and published.

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