

## When Tenosynovitis Misleads: Uncovering a Median Nerve Abscess in Leprosy

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A 32-year-old male with borderline lepromatous Hansen's disease on multibacillary multidrug therapy presented with acute pain, tingling, and swelling in the left wrist, initially diagnosed as tenosynovitis in a type-1 lepra reaction. High-resolution ultrasonography (HSUG) and magnetic resonance imaging (MRI) revealed a rare median nerve abscess masquerading as tenosynovitis, confirmed by anechoic lesions and post-contrast enhancement. Treatment with pulse methylprednisolone, tapering steroids, and splinting led to resolution without surgery, highlighting the role of imaging in early detection to prevent irreversible nerve damage.

**Keywords:** Borderline Lepromatous, Hansen's Disease, Leprosy, Tenosynovitis, Imaging, High-resolution Sonography, MRI

### Introduction

Leprosy (Hansen's disease) is a chronic granulomatous infectious disease caused by *Mycobacterium leprae* that primarily affects the skin and peripheral nerves. Most of the cases of leprosy can be diagnosed by cardinal signs of skin and nerve involvement. However, atypical forms of disease have been reported which indicate the need to be alert to such possibilities. We report a rare case of median nerve abscess in borderline lepromatous leprosy, initially masquerading as tenosynovitis, and discuss its successful management.

### Case report

32-year-old male, hailing from Uttar Pradesh, diagnosed case of borderline lepromatous leprosy

with left mobile ulnar claw-hand and right foot drop, on multibacillary multidrug therapy (MB-MDT) for two years due to irregular compliance, presented with complaints of acute onset of pain and tingling sensation over the left hand of 2 days duration. Two days later, he developed pain and swelling over his left wrist on the flexor aspect, without fever. Examination revealed mild tenderness, reduced power in the small muscles of the left hand, and a tender (Grade-3), globular swelling in the carpal tunnel area (Fig. 1). The rest of the physical examination, including the eyes, testes, and nose, was unremarkable. Slit skin smear examination for acid-fast bacilli was negative. He was initially diagnosed with tenosynovitis (Type-1 lepra reaction) and treated

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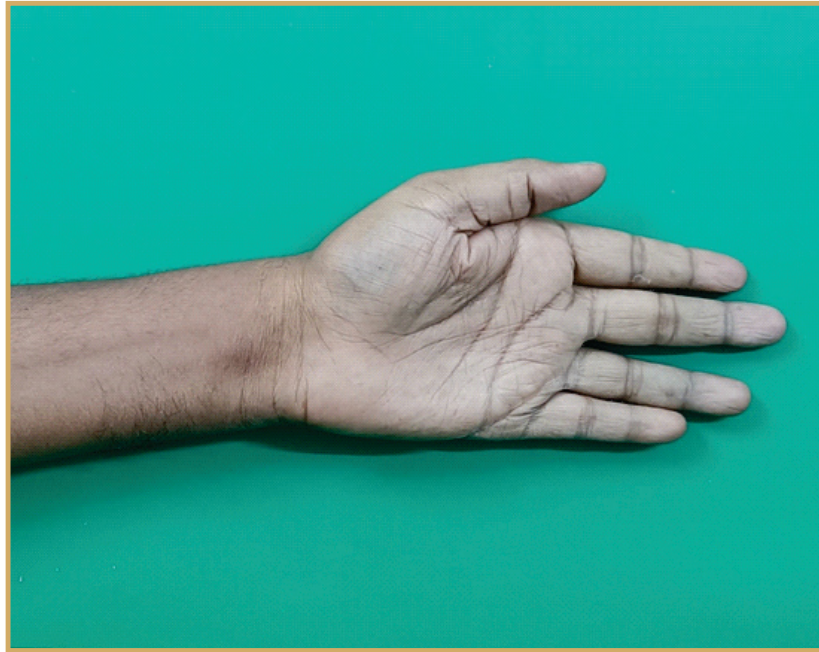
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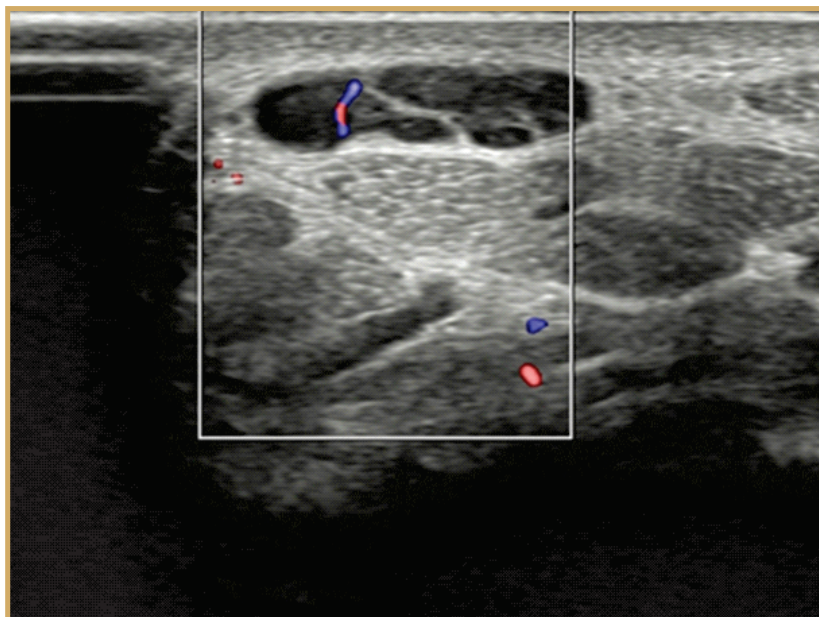
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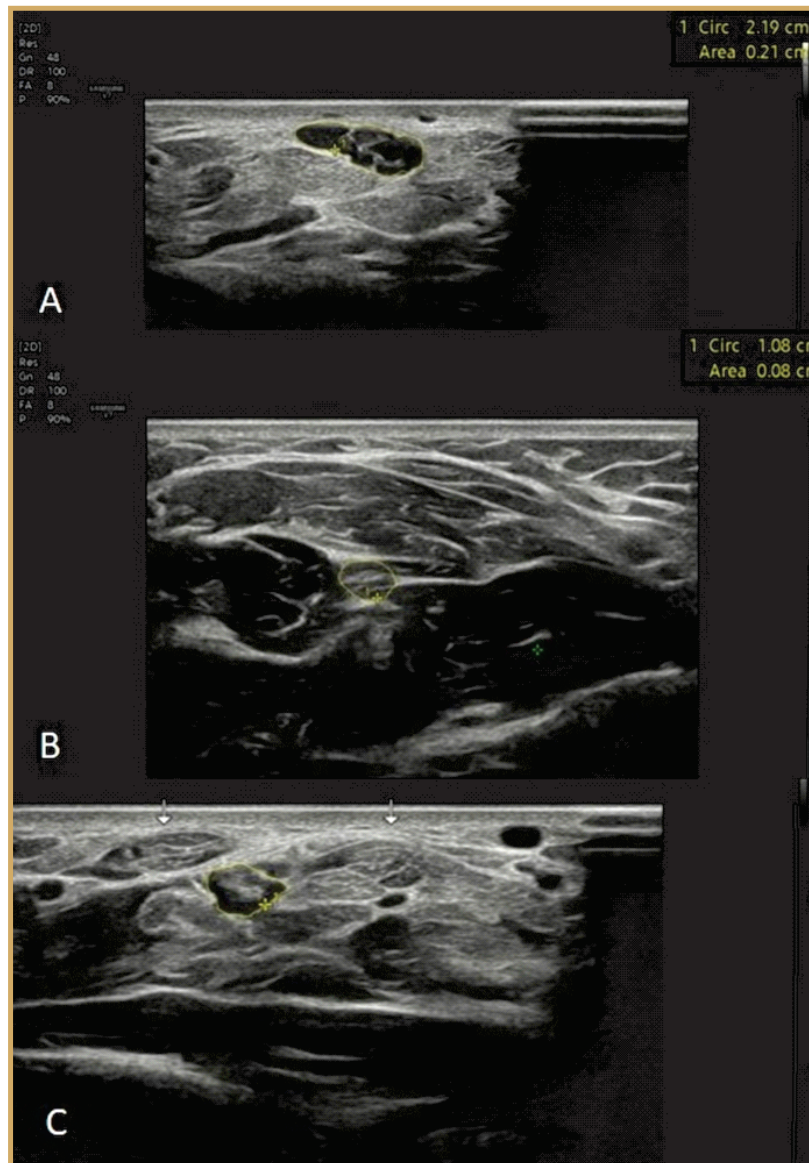
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**Fig. 1:** Clinical image showing swelling over his left wrist on the flexor aspect.



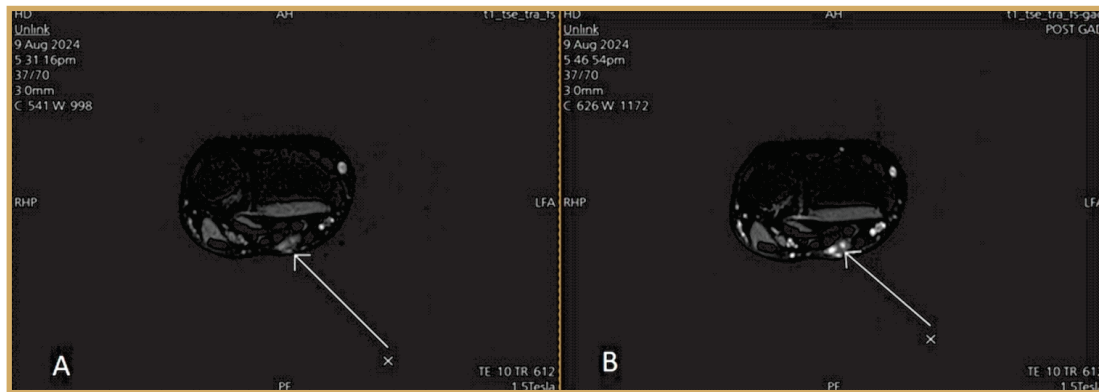
**Fig. 2:** Ultrasonography showing swollen fascicle in axial section of left distal median nerve, which appears hypoechoic and shows marginal vascularity.



**Fig. 3 (a, b & c):** USG- Axial section of left median nerve just above the wrist, shows swollen left median nerve with altered sonoanatomy just above the left wrist. Compare it with the adjacent normal median nerve (Fig. 3b) and the normal median nerve of the right wrist at the same level (Fig. 3c).

with oral prednisolone (1mg/kg/day). However, his symptoms worsened, with increased tenderness in the left wrist, and high-frequency

ultrasonography- USG (18MHz Transducer) revealed a 2.8x13.4x2mm anechoic area, on the medial aspect of the left median nerve at the



**Fig. 4 (a & b) : MRI-Axial T1 FS pre (Fig. 4a) and post contrast images ( Fig. 4 b) at the site of nerve thickening at the distal radius level shows two focal areas of post-contrast enhancement measuring 2.7mm x16mm and 1.6mm x17mm (diameter x length).**

level of the left wrist, suggestive of a median nerve abscess (Fig. 2). As the disease activity was not getting controlled on oral steroids and the individual being left-handed, he was started on pulse therapy in the form of intravenous methylprednisolone (500mgx3days), followed by a tapering steroids course. Follow-up USG at 5 weeks revealed focal thickening of the left median nerve (28mm length, 20.1mm<sup>2</sup> cross-sectional area) with two hypoechoic areas (largest: 20.5 length x 2.1mm diameter), with no evidence of anechogenicity and minimal patchy peripheral internal vascularity suggestive of an inspissated nerve abscess with surrounding granuloma (Figs. 3a, 3b, 3c). The contralateral normal median nerve at the same level measured 9 mm<sup>2</sup>. MRI (1.5T Siemens-Avanto) showed nodular thickening of the left median nerve (27mm length, 20.1mm<sup>2</sup> cross-sectional area) from the distal forearm to the wrist. The nerve exhibited two focal hyperintense lesions (16x2.7mm and 17x1.6mm) with restricted diffusion and post-contrast enhancement, suggestive of swollen neuronal fascicles due to non-caseating granuloma formation (Figs. 4a,

4b). Based on the imaging findings, a diagnosis of resolving left median nerve abscess with residual neuritis, rather than persistent acute neuritis alone, was made. The patient was continued on a tapering course of steroids. He was advised hand immobilisation with a supportive median nerve splint for restriction of movements. The patient showed gradual improvement over 2 weeks, with reduced swelling, tenderness, and weakness in the left hand. At 2-month follow-up, he was asymptomatic with significant reduction in median nerve thickening and no further neurological impairment.

### Discussion

Nerve abscesses in leprosy are rare, with an incidence of 1.3% in Indian patients (Kamath et al 2013). These are often cold abscesses and occur mainly in tuberculoid and borderline tuberculoid leprosy. Physically visible and palpable abscess in the median nerve is not commonly seen in contrast to the ulnar nerve around the elbow. These are usually cold abscess. Necrotic areas confined within the nerve sheath can be seen on radiological evaluation of affected nerve trunks. Although rare, nerve abscesses in lepromatous

leprosy are often multiple (Krishnan et al 2013). The selective tropism of lepra bacilli for nerve cells leads to Schwann cell invasion, particularly those ensheathing axons. Infiltrated schwann cells evolve to form granulomas, which can undergo caseous necrosis, leading to cold abscesses, particularly in individuals with robust immunity. This inflammatory response could lead to nerve compression and subsequent ischemia that could cause loss of sensory and motor function in leprosy patients (Serrano-Coll et al 2018). This process triggers a self-perpetuating cycle of cytokines release, worsening oedema, and ultimately leads to avascular necrosis of the nerve and cold abscess formation. Untreated nerve abscesses can lead to irreversible nerve damage within 24 hours, resulting in significant deformities, emphasising the need for prompt glucocorticoid treatment (Kamath et al 2013). Imaging modalities like ultrasonography and MRI aid in diagnosing peripheral nerve swellings. On ultrasound, normal nerves display a fascicular pattern (hyperechoic bands) in longitudinal views and a honeycomb-like structure (hypoechoic neuronal fascicles on a hyperechoic background) in transverse views. In contrast, leprosy-related nerve damage is characterized by focal thickening, hyperechoic areas, hypoechoic lesions with a disorganized fascicular pattern (Krishnan et al 2024). A nerve abscess can appear as a T1 iso-hypointense lesion and T2 hyperintense lesion (Gupta et al 2017). Our case demonstrates an unusual presentation of nerve abscess in borderline lepromatous leprosy, clinically mimicking tenosynovitis. The imaging findings were in keeping with the characteristic features of nerve abscess described in the

literature (Gupta et al 2017, Kamath et al 2013). The novelty of this case lies in its atypical musculoskeletal presentation and the diagnostic value of imaging in identifying the neural origin of the swelling.

### Conclusion

Our case illustrates an uncommon presentation of nerve abscess in borderline lepromatous leprosy, initially misdiagnosed as tenosynovitis. Prompt detection and effective management are essential to prevent long-term disability and avoid surgical intervention. Recent advancements in ultrasonography and MRI facilitate comprehensive nerve assessment, early diagnosis, and monitoring, ultimately improving patient outcomes.

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