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Case Report

Tuberculous compound palmar ganglion: unravelling a rare diagnosis

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Abstract: Background: Tuberculous tenosynovitis is a rare manifestation of musculoskeletal tuberculosis, often misdiagnosed due to its indolent course and nonspecific presentation. Compound palmar ganglion, a chronic form of tuberculous tenosynovitis, can mimic benign conditions like ganglion cysts, leading to diagnostic delays, especially in immunocompromised individuals. Case Report: We report a case of a 35-year-old HIV-positive female who presented with a painless swelling on the volar aspect of the wrist for six months. MRI revealed flexor tendon thickening and synovial proliferation, raising suspicion of infectious tenosynovitis. Surgical excision was performed, and histopathological examination confirmed tuberculous tenosynovitis with caseous granulomas. Ziehl-Neelsen staining identified acid-fast bacilli, confirming the diagnosis. The patient was started on standard anti-tubercular therapy (ATT) and showed complete resolution of symptoms at six months. Conclusion: Tuberculous compound palmar ganglion should be considered in chronic wrist swellings, particularly in endemic regions and immunocompromised patients. Early diagnosis using imaging and histopathology is crucial for timely management. A combination of surgical excision and ATT ensures favorable outcomes.

Keywords: Tuberculous tenosynovitis, compound palmar ganglion, musculoskeletal tuberculosis, HIV, wrist swelling, anti-tubercular therapy

Introduction

Tuberculous tenosynovitis, particularly in the form of compound palmar ganglion, is a rare but significant manifestation of extra-pulmonary tuberculosis, often misdiagnosed as a benign ganglion cyst or inflammatory arthritis due to its insidious onset and nonspecific clinical features [1, 2]. It primarily affects the flexor tendon sheaths of the wrist and hand (**Figure 1B**), leading to progressive synovial thickening, restricted movement, and, in advanced cases, tendon rupture or deformity. Early diagnosis and appropriate management are crucial to prevent long-term functional impairment [3].

The gold standard for diagnosing compound palmar ganglion is histopathological examination of the excised lesion, revealing caseating granulomas with Langhans giant cells, which are characteristic of tuberculous infection [6]. Microbiological confirmation, including Ziehl-Neelsen staining for acid-fast bacilli (AFB) and culture on Lowenstein-Jensen or MGIT medium, further supports the diagnosis. Additionally, GeneXpert MTB/RIF or polymerase chain reaction (PCR) can provide rapid confirmation and detect rifampicin resistance [7]. Imaging plays a crucial role in the initial assessment. Magnetic resonance imaging (MRI) is the most sensitive modality, typically showing multiloculated, synovial thickening along the tendon sheath, often without bony involvement in early stages [4, 5]. Ultrasound may also assist in differentiating tuberculous tenosynovitis from other soft tissue swellings by revealing hypoechoic, multilobulated lesions with synovial hypertrophy. Clinically, compound palmar ganglion presents as a painless, slow-growing swelling on the volar aspect of the wrist or palm, often leading to restricted flexor tendon movement. Unlike pyogenic tenosynovitis, overt inflammation, redness, or systemic signs are usually absent, though advanced cases may develop sinus formation or secondary bacterial infection [8, 9]. Laboratory findings are often non-specific but

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may include elevated ESR and CRP [10], normal or mildly elevated leucocyte count, positive tuberculin skin test or interferon-gamma release assay and HIV testing especially recommended in endemic regions, as tuberculosis is more common in immunocompromised individuals [11].

The management of compound palmar ganglion requires integration of anti-tubercular therapy (ATT) and, when necessary, surgical intervention. ATT has high cure rates (80-90%) when diagnosed early, reducing recurrence risk. Surgery significantly improves functional outcomes when combined with ATT, preventing complications such as tendon rupture or joint stiffness [17]. Prognosis is excellent with early diagnosis and treatment, but delayed cases may lead to permanent tendon damage, fibrosis, and functional impairment. Recurrence is low (5-10%) if ATT is completed and lesions are adequately excised [16]. This case report highlights the diagnostic challenges, clinical presentation, and therapeutic approach to compound palmar ganglion, particularly in an HIV-positive patient, emphasizing the importance of early suspicion, multimodal diagnosis, and a tailored treatment strategy to ensure optimal functional recovery.

Case presentation

A 35-year-old woman arrived at our clinic complaining of six months of swelling on the volar aspect of her right wrist (**Figure 1A**). The swelling was initially small and painless, with on and off fever, but no prior history of night sweats, coughing, weight loss, or trauma. Additionally, the patient did not have contact with any patients who had tuberculosis. The lump has gotten bigger over the last two months, severely restricting wrist and finger movements. Examining the area revealed a single, non-tender, 6×4 cm (centimetre) swelling that was firm and doughy and did not exhibit any palpable crepitus when moving the fingers. There was also no local rise in temperature. The distribution of the ulnar and median nerve territories was normal.

The wrist, hand, and chest X-rays were all normal. An MRI was recommended, and the results revealed thickening of the flexor retinaculum tendons' synovial lining (**Figure 1D-F**). Standard blood tests revealed normal findings except the patient tested positive for HIV (Human immunodeficiency virus) infection. The ESR was 22 millimetre/hour. Following all pertinent investigations, an excisional biopsy was scheduled. Volar approach was performed while using a tourniquet and regional anaesthesia (**Figure 1C**). Incision of the subcutaneous tissue was followed by exploration of the ulnar and radial teno-synovium. A large, bloated teno-synovium was discovered during surgery. The caseating/fibrous substance entirely swallowed the flexor tendon sheath, radial bursa, and ulnar bursa (**Figure 1G**). In order to carefully dissect the lesion, a portion of the carpal tunnel was cut. We were able to remove the lesion while keeping all the crucial structures.

On gross examination, the lump had a doughy substance and a crimson hue. There were no melon or rice bodies discovered. The tissue that was removed was submitted to HPE. The wound was closed after a thorough cleaning. As soon as the patient was able to tolerate pain, finger and wrist movements were encouraged starting on the second post-operative day. A thick lymphocytic infiltration was the backdrop for many Langhans giant cells with ill- to well-formed granulomas, as seen by HPE (**Figure 1I**). The initiation of anti-tubercular treatment (ATT) followed the biopsy's confirmation of tuberculosis. The patient's wrist swelling had not returned at the 6-week follow-up, but a new erythematous lesion had been discovered at the base of the middle finger (**Figure 1H**). We only kept the ATT going for a year without doing any surgical intervention for the new lesion. After a year, the patient showed no symptoms of recurrence and had fully recovered wrist and finger function (**Figure 1J-L**).

Discussion

Tuberculous compound palmar ganglion is a rare manifestation of extrapulmonary tuberculosis, often misdiagnosed due to its chronic, insidious progression and nonspecific clinical presentation. It primarily affects the flexor tendon sheaths, leading to progressive swelling, synovial thickening, and functional impairment [1, 2]. Delayed diagnosis can result in tendon adhesions, rupture, or joint stiffness, emphasizing the need for early recognition and appropriate management [3]. This case highlights the diagnostic challenges and therapeutic con-

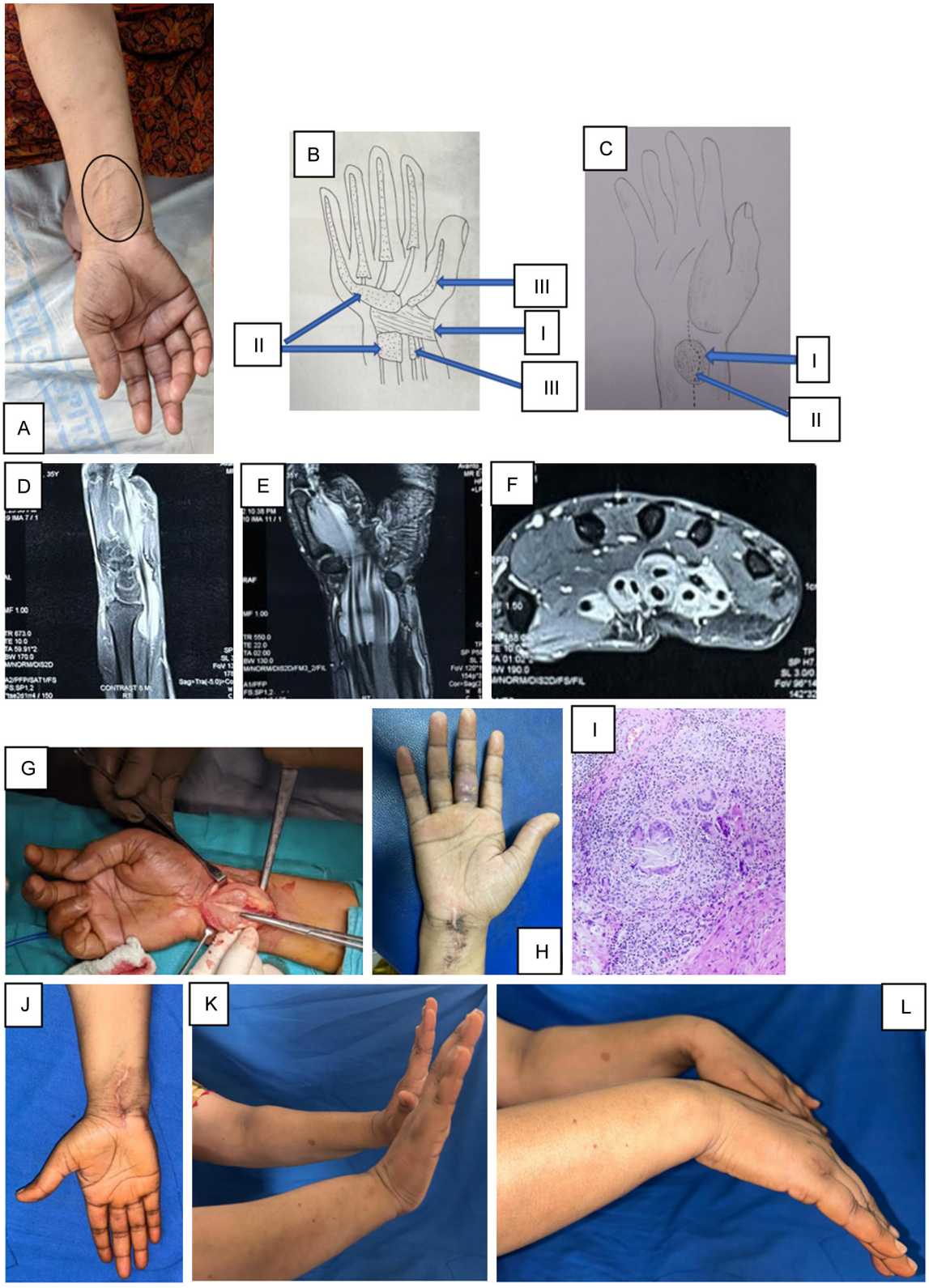

Figure 1. A 35 year/female presented with swelling over volar aspect of the wrist (A); Diagram showing flexor retinaculum (i), ulnar bursa (ii), and radial bursa (iii) (B); Diagram showing extent of swelling (i), and line of incision (ii) (C); Sagittal, coronal and axial PDFS (Proton density fat saturated) images showing hyperintense collection in the tendon sheath extending from distal forearm to palm region predominantly radial aspect (D-F); Intra-operative im-

ages showing caseating substance encasing flexor tendons, radial and ulnar bursa (G); Clinical image at 6 weeks showing healed scar and an erythematous swelling at the base of middle finger (H); Multiple Langhans giant cell with ill to well-formed granuloma in the background of lymphocytic infiltrate (I); Functional outcome at 1 year post ATT showing no recurrence with full ROM of wrist and fingers (J-L).

siderations in the management of compound palmar ganglion, particularly in an HIV-positive patient, where the disease course and immune response may differ from immunocompetent individuals. Additionally, the newly observed erythema and swelling at the base of the middle phalanx after two months of anti-tubercular therapy (ATT) and surgery necessitate careful evaluation for potential paradoxical reactions, reactivation, or drug-related effects.

The diagnosis of compound palmar ganglion relies on a combination of clinical assessment, imaging, histopathology, and microbiology. MRI is the most sensitive modality, demonstrating multiloculated fluid collections, synovial thickening, and tendon sheath involvement. Ultrasound can aid differentiation from ganglion cysts, revealing hypoechoic, lobulated lesions with synovial hypertrophy [11]. Definitive Diagnosis usually requires Histopathological and Microbiological evaluation. Caseating granulomas with epithelioid cells and Langhans giant cells are usually seen in HPE [6, 7]. Ziehl-Neelsen stain may detect M. tuberculosis, though sensitivity is low [8]. GeneXpert MTB/RIF or PCR provides rapid confirmation and rifampicin resistance detection [9]. Given the nonspecific presentation, compound palmar ganglion should be differentiated from pyogenic tenosynovitis, rheumatoid arthritis, deep-seated ganglion cysts, and other soft tissue tumours.

Treatment involves a combination of ATT (anti-tubercular therapy) and, in select cases, surgical intervention. ATT of standard 6-month regimen (HRZE) is effective, but prolonged therapy (9-12 months) may be required in immunocompromised patients [12, 13]. Rifampicin interactions with ART (antiretroviral therapy) must be carefully monitored in HIV patients [14]. Surgical Management involves excisional biopsy, debridement and synovectomy especially in advanced cases to prevent recurrence and tendon reconstruction for cases with adhesions or rupture [15-17]. Prognosis is excellent when ATT is completed, with a low recurrence rate (~5-10%) [18]. However, delayed treatment can result in functional impairment due to fibrosis and tendon damage [19].

HIV is a major risk factor for extrapulmonary tuberculosis, including musculoskeletal TB. Immunosuppression in HIV alters the clinical presentation, often leading to atypical, disseminated, or more aggressive disease [20]. Several key points highlight this association:

1. HIV-positive individuals have a higher likelihood (~50%) of developing extrapulmonary TB [21]. 2. Immunosuppression impairs granuloma formation, allowing M. tuberculosis to spread beyond the lungs [22]. 3. Anergy to tuberculin skin test (Mantoux) is common, making conventional TB screening less reliable [23]. 4. Paradoxical reactions (IRIS) are frequently seen after initiating ATT, causing worsening inflammatory symptoms [24].

Given these risks, HIV screening should be routine in patients with musculoskeletal TB, and their treatment requires careful monitoring for immune reconstitution reactions [25]. The erythema and swelling noted two months post-treatment may be attributed to paradoxical reaction (Immune Reconstitution Inflammatory Syndrome - IRIS), persistent tuberculosis or reactivation, drug induced inflammatory response or secondary infection [24, 26-28]. As the lesion was mild and did not significantly impact the patient's functional recovery, we did not address it surgically. Given the timeline and clinical context, this reaction was presumed to be a paradoxical response (IRIS), which is well documented in tuberculosis treatment especially in immunocompromised individuals.

For optimal management: 1. Early suspicion and multimodal diagnosis (MRI, histopathology, GeneXpert) are crucial. 2. ATT remains the cornerstone of treatment, with surgical intervention reserved for severe cases. 3. HIV-positive patients require extended ATT duration and careful monitoring for paradoxical reactions. 4. New inflammatory lesions post-ATT should raise suspicion for IRIS, persistent TB, or drug-related effects, warranting individualized management.

Conclusion

This case highlights the importance of early diagnosis and tailored treatment in managing tuberculous compound palmar ganglion, particularly in HIV-positive individuals. Given the complex interplay between tuberculosis, immunosuppression, and paradoxical inflammatory responses, clinicians should remain vigilant for IRIS, ATT-related complications, and secondary infections during follow-up. By understanding these challenges, clinicians can ensure better functional outcomes while minimizing complications in patients with tuberculous compound palmar ganglion.

Disclosure of conflict of interest

None.

Abbreviations

TB, Tuberculosis; ATT, Anti-tubercular treatment; HPE, Histopathological Examination; MRI, Magnetic Resonance Imaging; HRZE, Isoniazid, Rifampicin, Pyrazinamide, Ethambutol; HIV, Human Immunodeficiency Virus; AFB, Acid Fast Bacilli; MGIT, Mycobacteria growth indicator tube; MTB/RIF, Mycobacterium tuberculosis/Rifampicin resistance; PCR, Polymerase chain reaction.

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