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CASE REPORT
Hand

A Rare Presentation of Hand TB Extending to the Space of Parona

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Summary: Most cases of hand infections are caused by gram-positive cocci and gram-negative bacilli. Atypical hand infections are rare and are caused by uncommon pathogens like *Mycobacterium tuberculosis* (TB). Musculoskeletal tuberculosis accounts for 20% of TB cases, and only 2% of these cases involve the hand and foot. In this article, we describe a case of hand TB that had spread from the thenar space to the space of Parona. The patient was treated with a combined surgical and medical approach. A 29-year-old male patient presented to our clinic with the complaint of pain and swelling of the right hand that had been worsening for 4 months before presentation. It was associated with mild weakness and night sweats. On physical examination, he had two separate swellings: one at the thenar eminence and one at the volar side of the wrist. He was taken for incision, which showed caseous material on both sites. It was sent for culture that revealed *mycobacterium tuberculosis*. The patient was placed on anti-TB medications for a total of 6 months. Tuberculous infection of the hand is a rare condition; the most common musculoskeletal sites are the spine, hip, and knee. Early diagnosis and treatment of TB infection in hand are essential for retaining optimal function. The diagnosis usually depends on the clinical presentation supported by laboratory tests and imaging studies. Treatment consists of medical, surgical, or combined treatment. Surgical intervention should aim to remove all the infected material in addition to debridement of the involved tissues. *(Plast Reconstr Surg Glob Open 2022;10:e4156; doi: 10.1097/GOX.0000000000004156; Published online 17 March 2022.)*

Most cases of hand infections are caused by gram-positive cocci and gram-negative bacilli, which have an acute onset with obvious inflammatory symptoms and systemic manifestations. Atypical hand infections caused by uncommon pathogens like *Mycobacterium tuberculosis* usually have an indolent course, which leads to diagnostic delays.[1] Tuberculosis (TB) was responsible for an estimated 1.3 million deaths among HIV-negative people in 2017 and it is the leading cause of death from a single infectious agent.[1–5] Musculoskeletal tuberculosis accounts for only 20% of patients with tuberculosis, and among these, only 2% involve the hand and foot.[5–7] Although rare, tuberculosis of the hand has a variable clinical presentation with involvement of bone and soft tissues.[2–4] The diagnosis of extrapulmonary tuberculosis is confirmed by the pathology examination of biopsied material and a positive culture. It is well known that the frequent absence of laboratory assistance complicates the diagnosis of the disease.[8] Early diagnosis is very difficult and might be delayed in early stages of the disease.[9] We present a case of cold abscess of the hand that involved the thenar compartment and extended to the space of Parona through the sheath of the flexor pollicus longus (FPL) tendon caused by *Mycobacterium tuberculosis* complex, as a rare presentation of the disease.

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CASE PRESENTATION

A 29-year-old male patient with no known comorbidities and who works at a hotel laundry, presented to our clinic with pain and swelling of his right hand of 4 months duration. His symptoms progressed slowly to involve the distal forearm. One month before presentation,

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the swelling had enlarged to be obviously visible with a marked increase in the severity of pain that limited his ability to work. The patient also complained of night sweats which had increased in frequency over the course of four months. He had no other associated symptoms; his pain was nonspecific and there were no exacerbating or alleviating factors. He could not recall any provocative incident like trauma, penetrating injury or an insect bite. He had no contact with animals and was not involved in gardening work. On physical examination, he had a fluctuant swelling over the thenar eminence and another one over the volar aspect of the wrist with mild tenderness. No redness, hotness, or overlying skin changes were noted. Neurovascular examination showed weak wrist and thumb flexion, which the patient attributed to pain. There was normal sensation and full range of motion of the right-hand fingers. His laboratory investigations had normal results except for a slightly elevated CRP of 36, and he was negative for HIV. His chest and hand X-rays were unremarkable. Depending on strong clinical suspicion and without further investigations, the patient was taken for exploration. Two incisions were made, one over the thenar area and another over the wrist. Findings in the superficial spaces were unremarkable. On deeper dissection, there was a large amount of caseous material involving the flexor sheath of the FPL tendon extending through the sheath to the space of Parona (Fig. 1). All the material was evacuated and sent for acid fast smear and culture for mycobacteria. In addition, the excised synovium was sent for tissue culture and a blood sample was sent for TB PCR as the suspicion was high for hand TB. Copious irrigation of the evacuated spaces was done, and the incisions were closed primarily with placement of a corrugated drain, which was removed after 3 days. The patient was discharged home, and sutures were removed after 2 weeks in the clinic. Results of the culture revealed *Mycobacterium tuberculosis* complex susceptible to conventional TB medications, with positive PCR in the blood. The patient was placed on the TB protocol by our hospital's infectious disease department, which consists of daily rifampin150 mg, isoniazid 75 mg, pyrazinamide 400 mg, and ethambutol 275 mg, for 2 months followed by 4 months of daily rifampin 300 mg and isoniazid 150 mg. At the time of submitting this case, he was four months posttreatment showing full hand recovery and had resumed his work without limitations. He still had 2 months of medical treatment left and he is currently followed up in our clinic and the TB clinic to detect any recurrences.

DISCUSSION

Tuberculous infection of the hand is a rare condition even in areas with high prevalence of TB, and with the advent of antituberculosis medications, control of tuberculosis has been achieved and its incidence in the hand has diminished.[10] Musculoskeletal TB usually develops from hematogenous spread of reactivated pulmonary TB or direct inoculation. In cases of hand TB, it can present as either a cutaneous disease, bursitis, TB arthritis, osteomyelitis, or, most commonly, tenosynovitis. Pain and swelling are the most common presenting features, followed by discharging sinuses.[11,12] It mostly affects the dominant hand, and it is more prevalent in men. It is frequently the only site affected by the disease without pulmonary involvement.[13,14] Early diagnosis and treatment of hand TB are essential for retaining optimal function. The functional outcome is better following involvement of the fingers than of the wrist.[12,15] Making the diagnosis depends on the clinical presentation supported by laboratory tests and

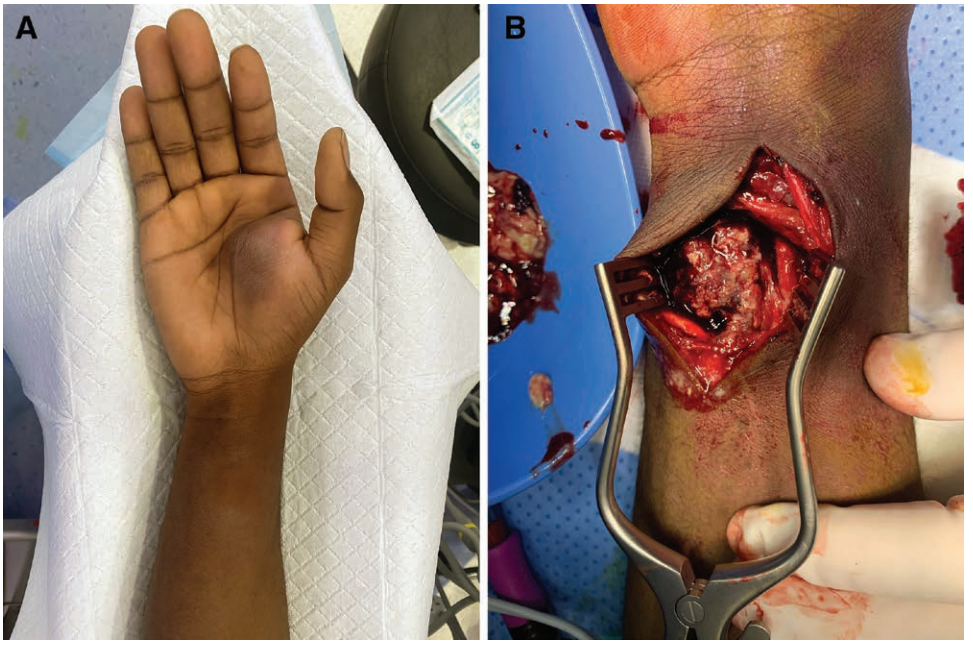

Fig. 1. Hand TB. A, A preoperative photograph showing a swelling in the thenar area and distal forearm. B, An intraoperative photograph demonstrating the caseous material that was found to be an atypical TB infection.

imaging studies. White blood cell count is usually normal in cases of atypical hand infections, with mild elevation of the inflammatory markers, as noted in our patient.[14] Making a definitive diagnosis relies on the detection of the organism through acid fast staining of the specimen or prolonged cultures in the proper media. TB PCR can aid in making the diagnosis as well, and MRI studies provide images of high anatomic definition that can detect any bone or soft tissue inflammation, synovial thickening, swelling, rice bodies, and fluid collections.[14] Treatment consists of medical, surgical, or combined treatment. Most investigators advocate the combined use of surgical drainage and debridement plus antibiotics administration to cure the infection and reduce the incidence of recurrence.[14,16] Surgical intervention should aim to remove all the infected material, in addition to debridement of the involved tissues like synovium or bone. Following surgery, local blood flow is increased, which results in early healing in musculoskeletal tuberculosis.[11] Medical treatment consists of multiple medications use for prolonged periods of time to avoid drug resistance issues. Many regimens exist; the one followed by our infectious diseases department is an intensive phase for 2 months of isoniazid 75 mg, rifampin 150 mg, pyrazinamide 400 mg, and ethambutol 275 mg, followed by a continuation phase for 4 months of isoniazid 150 mg, and rifampin 300 mg.

CONCLUSIONS

We report the case of a patient who suffered from hand TB infection without any signs of systemic or pulmonary involvement. It is unique because of the worldwide diminished incidents of hand TB in addition to the fact that the infection had traveled from the flexor sheath of the FPL to the space of Parona. This route of infection has been mentioned in theory; however, actual reported cases were not found upon searching the previous literature. The patient sustained the infection most probably by direct inoculation, and the diagnosis was made clinically and was confirmed by culture and TB PCR. The case was managed with combination therapy of drainage, irrigation and debridement, then with extended medical treatment according to TB protocol. We hope that by reporting this case, we will bring the light again to the possibility of having hand TB infection despite the world-wide progresses made in decreasing its incidence, and to manage accordingly.

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