

Excision Arthroplasty for First CMC Joint Tuberculous Osteomyelitis

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What to Learn from this Article?

A timely surgical intervention with thorough debridement give a good clinical outcome with no joint instability.

Abstract

Introduction: Tuberculous involvement of metacarpals and phalanges is a rare presentation of extrapulmonary tuberculosis in adult. Tuberculous infection of the metacarpals, metatarsal and phalanges of hands and feet is known as tubercular dactylitis.

Case Report: A 65 years old female with history of pain and swelling at 1st metacarpal of left hand, since 3 months which gradual in onset and progressive in nature associated with multiple cervical swellings. While radiographs showed a pathological fracture of the 1st carpo-metacarpal joint (CMCJ) with soft tissue swelling, MRI revealed a large heterogenous lesion at the carpo-metacarpal joint of the thumb with bony erosions of the trapezium and 1st metacarpal base on T2W-STIR images. The lesion was extending upto the palmar aspect of the hand and displacing flexor pollicis longus tendon medially. During surgery, there was caseous material seen which was debrided and the fractured fragment was excised and sent for biopsy. The CMCJ was found to be unstable and a kirschner wire was used to stabilize the 1st CMCJ and immobilized in a POP splint. The biopsy of the fragment revealed tuberculous osteomyelitis. On follow-up the K-wire had backed out partially at the end of 5 weeks which was then removed and range of motion was started. At end of 1 year follow up the patient had little restriction of movement as compared to the opposite hand with no pain and hindrance in daily activity.

Conclusion: The swelling subsided once Anti-Tubercular Treatment was started. The cervical lymphadenopathy also resolved over a period of 1 month.

Keywords: Tubercular dactylitis, tuberculous osteomyelitis, Cervical lymphadenopathy.

Introduction

Osteoarticular tuberculosis comprises 1-4.3% of all tuberculosis cases and 10-15% of all extrapulmonary tuberculosis cases[1]. Isolated involvement of bone by tuberculous infection is uncommon, and the clinical and radiological picture usually mimic chronic pyogenic osteomyelitis, brodie's abscess, tumors or granulomatous lesions[2-4]. Tuberculous involvement of the

metacarpals and phalanges is a rare presentation with fewer presentation in adults. Tuberculous infection of metatarsal and phalanges of hands and feet is known as tubercular dactylitis. 85% of patients with tubercular dactylitis are of age group less than 6 years[5,6]. This is associated with destruction of the joint which presents usually presents late clinically. We present to you an aged female with isolated tuberculous affection of the 1st CMC joint.

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Author's Photo Gallery



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Figure 1: swelling on 1st metacarpal



Figure 2: cervical swelling



Figure 3: MRI, X-ray and ultrasound of the left hand (from left to right)



Figure 4: cervical swelling

Osseous affection by tuberculosis is usually treated with conservative treatment using anti-tuberculous therapy. Surgical intervention in form of curettage usually helps in earlier healing[7].

Case report

A 65yrs old female came to our department with complaints of pain and swelling of the left hand along the thenar eminence and the proximal aspect of the thumb. She did not have history of any trauma prior to the development of swelling. The swelling was noticed two months ago and was progressive in nature and was painful on movements [Fig 1]. She simultaneously developed multiple swellings in the cervical region which most likely pointed towards cervical lymphadenopathy [Fig 2]. She didn't have any past history of tuberculosis or exposure to tuberculous contact. She did not have any associated symptoms like loss of appetite, weight loss or any evening rise of temperature.

A plain radiograph of the patient was taken which showed pathological fracture of the base of 1st metacarpal along with lytic lesion at the base of the 1st metacarpal with haziness of the surrounding soft tissue [Fig 3]. On x-ray we came to a provisional differential diagnosis of pathological fracture secondary to a pyogenic infection, tuberculous osteomyelitis or soft tissue swelling, malignancy. An ultrasound revealed presence of an abscess. The USG was done to rule out any malignant involvement of the soft-tissue [Fig 3]. An MRI scan showed a large heterogeneous lesion at the 1st carpo-metacarpal joint space along with joint space widening [Fig 3]. The MRI scan suggested an abscess like picture most likely due to infective etiology and less likely to be neoplastic lesion.

She was then posted for drainage of abscess and debridement with stabilization of the fracture fragment. Intra-operatively we found thick caseous material within the soft tissue and the fragment at base of the 1st metacarpal was freely mobile similar to a loose body [Fig 6]. It was not possible to fix that fragment as it looked infected on gross inspection and hence it was removed and sent for biopsy and culture sensitivity along with the surrounding soft-tissue. We

also found that after removal of the fragment the joint was unstable and hence a kirschner wire was passed through the 1st carpo-metacarpal joint to stabilize it [Fig 7]. Post-operatively the hand was immobilised in a below elbow POP splint to give added stability. A cervical lymph node biopsy was also taken during the same sitting and sent for histo-pathology to confirm if the lymph nodes were due to tuberculosis or some other cause like malignancy or viral respiratory infection which are common in Indian scenario.

The biopsy report came back positive for tuberculous osteomyelitis which suggested fibro-collagenous tissue and few bony fragments showing large caseous necrosis with few epitheloid cell granuloma. The patient was then started on anti-tuberculous treatment empirically while awaiting the culture report. A Combination of Isoniazid (300mg), Rifampicin (450mg), Pyrazinamide (1500mg) and ethambutol (800mg) was started as intensive phase for a period of 6 months under the guidance of a chest physician and then the continuous phase for a period of 6 months where Isoniazid (300mg) and Rifampicin (450mg) was given. The culture reports were obtained at the end of 6 weeks and the mycobacterium species showed sensitivity to the primary drugs which were started. Routine liver function tests were repeated every 3 months which were normal in the patient.

At the end of 5 weeks the kirschner wire backed out partially which was then removed and range of movement exercises were started. The cervical lymphadenopathy regressed by the end of 3 months. The patient had 1 episode of recurrence of cervical lymphadenopathy at the end of 7 months of treatment which eventually regressed on the continuous phase of AKT. The patient had almost complete range of movement at the end of 3 months with no sequel due to tuberculosis as compared to the opposite hand with no joint instability [figure 6]. We did not plan any further intervention as the patient was having a stable joint at the end of 3 months and we decided to keep a regular follow up of the patient. The patient was then followed up regularly upto end of 1 year and the ranges of movements were compared with the opposite hand. There was very little restriction of movement of the thumb as



Figure 5: Immediate Post-op X-ray showing stabilization of the 1st metacarpal-phalangeal joint with K-wire after excision of the 1st metacarpal base



Figure 6: Post-op range of motion and x-ray at end of 3 months



Figure 7: 1 year follow up x-ray and range of motion with grip strength.

compared to the opposite hand with a stable joint not subluxating on movements. Plain radiographs showed some degree of joint remodelling at one year. The grip strength was adequate to do any daily household activity which was the only requirement of the patient [Fig 7].

Discussion

Mild pain and swelling, with slight warmth and associated cervical lymphadenopathy should alert a physician to rule out possibility of tuberculosis in an Indian set-up. At times presence of a discharging sinus is also of great importance. Tuberculous involvement of the tubular long bones is a rare presentation in itself and isolated presentation of tuberculous dactylitis is even rarer. Along with tubercular dactylitis differentials of pyogenic abscess, malignancy or post-traumatic soft tissue swellings should be borne in mind. Around 85% of patients with tubercular dactylitis are of age group younger than 6 years [9]. Tuberculous dactylitis in adults is rare. Very few patients having tuberculosis of the bone are diagnosed with concomitant active pulmonary disease [8].

Our patient presented with no pulmonary involvement and only had painful, swollen 1st metacarpal with no previous history of any trauma. A provisional diagnosis of tubercular dactylitis was made on radiographs and MRI scan but tubercular dactylitis being rare in adults made it impossible for us to be sure a single diagnosis. Hence a surgical intervention was planned to take a biopsy and debride the joint with stabilization.

Intra-operatively it was considered to remove the proximal fragment as there was infectious involvement of the joint and the proximal fragment. After removal of the proximal fragment the joint was unstable and hence the joint had to be stabilized using kirschner wire which was passed through the 1st CMCJ. The fixation acted like an excision arthroplasty of the joint which needed stabilization and immobilization. Post-operatively we expected the joint to be unstable without support but the wire backed out partially at the end of 5 weeks and the joint was found to be stable and patient was started on range of motion exercises for the thumb. At 1 year of follow-up the patient has good range with fair grip strength with no difficulty in doing daily activity as compared to the opposite hand along with a stable joint.

Radiological features of bony tuberculosis (sclerosis and osteolytic lesion) are present in other conditions such as inflammatory arthritis, Pyogenic Osteomyelitis, Brodies abscess, Kaposi's sarcoma and other malignancies [8]. Hence these differentials should always be kept in mind. Other radiological features such as osteopenia, soft-tissue swelling with minimal periosteal reaction, narrowing of joint space, subcondral erosions are non-specific and often delay the diagnosis.

The gold standard for diagnosis of osseous tuberculosis is culture and histo-pathological evidence of mycobacterium tuberculosis from the bone tissue. To obtain positive results of ziehl-neelsen staining for acid-fast bacilli the colony count requires to be at least 104 acid-fast bacilli per millilitre of the specimen and it does not differentiate between tuberculous mycobacteria and non-tuberculous mycobacteria. [9]

Treatment recommendations state the use 4-drug regimen which include isoniazid, rifampicin, pyrazinamide and ethambutol for a period of 2-4 months which is the intensive phase of the treatment followed by 2- drug regimen of isoniazid, rifampicin for period of 6 to 10 months depending on the patients functional recovery [8].

In 2005, Agarwal et al [9] stated that Ziehl-Neelsen staining and culture obtained during the course of surgery is a gold standard for diagnosis of tuberculous osteomyelitis.

In 2008 Kushwaha et al [8] stated that Tuberculous dactylitis is a difficult diagnosis and should be suspected in long standing cases with pain and swelling of the phalanges and metacarpals.

In an endemic country like India the diagnosis of tubercular osteomyelitis should be kept in mind while making the differential diagnosis of several osseous pathologies.

Conclusion

Early diagnosis with prompt debridement of tubercular dactylitis is the key to avoid long term arthritic sequel and return of range of motion activities. The diagnosis of tubercular dactylitis should always be kept in mind.

Clinical Message

Excision arthroplasty for tuberculous affection of the 1st carpo-metacarpal joint has excellent results with joint remodelling as the end result.

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