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**Dr. Saiel Kumarjuvekar**  
MBBS, MS Orthopaedics,  
Department of Orthopaedics,  
BJGMC & SGH, Pune,  
Maharashtra, India

**Dr. Minish R Katkar**  
MBBS, MS Orthopaedics DNB  
Orthopaedics, Department of  
Orthopaedics, BJGMC & SGH,  
Pune, Maharashtra, India

**Dr. Vijay Waghmare**  
MBBS, MS Orthopaedics,  
Department of Orthopaedics,  
BJGMC & SGH, Pune, MH  
India

**Dr. Mangesh Ranjankar**  
MBBS, Resident, Department of  
Orthopaedics, BJGMC & SGH,  
Pune, Maharashtra, India

**Dr. Ajay Kamat**  
MBBS, MS Orthopaedics,  
MRCS, Department of  
Orthopaedics, SSPM Medical  
College and Lifetime Hospital,  
Sindhudurg, Maharashtra, India

**Corresponding Author:**  
**Dr. Saiel Kumarjuvekar**  
MBBS, MS Orthopaedics,  
Department of Orthopaedics,  
BJGMC & SGH, Pune,  
Maharashtra, India

## Tubercular osteomyelitis of the second metacarpal in a 20-year-old male

**Dr. Saiel Kumarjuvekar, Dr. Minish R Katkar, Dr. Vijay Waghmare, Dr. Mangesh Ranjankar and Dr. Ajay Kamat**

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### Abstract

Tubercular osteomyelitis is a rare manifestation of skeletal tuberculosis, particularly affecting the metacarpals. Here, we report a case of a 20-year-old male patient presenting with tubercular osteomyelitis of the second metacarpal. The patient's diagnosis, treatment, and clinical outcome are discussed to provide insight into this uncommon presentation and its management.

**Keywords:** Tubercular osteomyelitis, second metacarpal, tuberculosis, skeletal TB, anti-tubercular therapy, masquete

### Introduction

Tuberculosis (TB) remains a major global health challenge, with skeletal tuberculosis accounting for approximately 10% of all extrapulmonary cases. Tuberculosis (TB) primarily affects the lungs, but extrapulmonary manifestations such as osteoarticular TB are increasingly reported. Tubercular osteomyelitis of the hand bones is rare, comprising a small fraction of osteoarticular TB cases. This report highlights the diagnostic challenges and treatment approach for tubercular osteomyelitis of the second metacarpal in a young adult.

### Case Presentation

A 20-year-old male presented with a two-month history of pain and swelling in his right hand, specifically localized to the second metacarpal. He reported progressive discomfort and noticed a gradual increase in swelling over this period. There was no history of trauma, and the patient denied any systemic symptoms such as fever, weight loss, or night sweats.

On physical examination, there was noticeable swelling and tenderness over the second metacarpal. The overlying skin was intact, and no sinus formation was observed. The range of motion in the affected finger was restricted due to pain. There were no palpable lymph nodes in the axillary region.

Radiographic imaging of the right hand revealed osteolytic lesions (Fig. 1) with cortical destruction in the second metacarpal, raising suspicion for infectious etiology. Magnetic resonance imaging (MRI) demonstrated marrow edema and soft tissue involvement consistent with osteomyelitis. Laboratory investigations showed an elevated erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels. The Mantoux test was positive, with an induration of 18 mm. A fine-needle aspiration biopsy of the lesion was performed, revealing caseating granulomas on histopathological examination. Ziehl-Neelsen staining and culture confirmed the presence of *Mycobacterium tuberculosis*. A chest X-ray was unremarkable, ruling out active pulmonary tuberculosis.

The patient was started on a standard anti-tubercular therapy (ATT) regimen, including isoniazid, rifampicin, pyrazinamide, and ethambutol for the initial two months, followed by isoniazid and rifampicin for an additional ten months. The patient was monitored for drug compliance and adverse reactions throughout the treatment period.

Patient was subjected to debridement of the second metacarpal region (Fig2) and a cement spacer with antibiotic was used as a filler for the space.(Fig 3) At 6 weeks after the index surgery cement spacer was removed and cortico-cancellous bone graft was introduced in the

biofilm which was fixed with a mini plate. (Fig 4)

### Follow-up and Outcomes

At the six-month follow-up, the patient showed significant clinical improvement. Radiographs demonstrated healing and uptake of graft at the affected metacarpal. The ESR and CRP levels normalized. The patient completed the 12-month ATT regimen without complications and regained full function of the right hand.

### Discussion

Tubercular osteomyelitis of the hand bones, particularly the metacarpals, is rare and can often mimic other conditions such as pyogenic osteomyelitis or neoplastic lesions. Early diagnosis is crucial for effective management and prevention of complications. Imaging and histopathological evaluation play vital roles in confirming the diagnosis. The standard ATT regimen remains the cornerstone of treatment, with surgical intervention reserved for cases with abscess formation or necrotic tissue requiring debridement and use of masquelet technique. This case highlights the importance of considering TB in the differential diagnosis of osteolytic lesions in endemic areas and underscores the efficacy of conservative management with ATT.



Fig 1: Follow-up and Outcomes

### Conclusion

Tubercular osteomyelitis of the second metacarpal, though rare, should be considered in young patients presenting with unexplained osteolytic lesions. Prompt diagnosis and appropriate anti-tubercular therapy can lead to favorable outcomes and preserve hand function. Further awareness and reporting of such cases are essential to improve recognition and management of this uncommon condition.

### Conflicts of Interest

The authors declare no conflicts of interest.

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