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### RESEARCH ARTICLE

#### TUBERCULOSIS OF HAND: IS CONSERVATIVE TREATMENT THE KEY?

Ankit Kataria, Sumedh Kumar, Ashok Kumar and Ram Kishore

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#### Abstract

**Introduction:** Musculoskeletal Tuberculosis is seen in 10-15% of all cases and hand involvement is seen in about 10% of this subset. This study was done to bring to light the various clinical manifestations of tuberculosis in the hand, emphasizing the importance of early diagnosis and timely anti-tubercular therapy for a good functional outcome, especially in a country that is endemic to tuberculosis.

**Methods:** This study was a retrospective, observational study in which patients who were presented to the out-patient department of a tertiary care teaching hospital in western Uttar Pradesh, between January 2020 to January 2022 with suspected tuberculosis of the hand were included. A diagnosis of tuberculosis was made in patients with clinico-radiological features and histopathological confirmation or a positive centrifugation-based nucleic acid amplification test (CBNAAT). Anti-tubercular therapy was started as per the National Tuberculosis Elimination Program (NTEP). Surgical intervention was done for cases that did not respond to medical management for four to six weeks. Patients were followed up at one, three, six and 12 months and were assessed radiologically, and functional scoring was done by a modified Green O'Brien score.

**Results:** In our study of 11 patients, 10 patients (91%) were treated by conservative management and only one patient required surgical intervention in addition to pharmacotherapy. The mean Green O'Brien score improved from a mean score of 52 (poor) prior to initiation of therapy to 88 (Good) on the last follow-up visit.

**Conclusion:** Tuberculosis is often caught masquerading as something else due to its various manifestations and indolent course of disease. Our study reinforces the school of thought that early detection and a conservative approach with anti-tubercular therapy leads to a good functional outcome for the patient.

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#### Introduction:-

The Global Tuberculosis Report 2022 stated that a total of 10.6 million people fell ill with TB worldwide with 1.4 million succumbing to it. India contributed a solid 28% to these large numbers [1]. This makes it abundantly clear that Tuberculosis is still a major entity in the demography of the world and in India. Musculoskeletal Tuberculosis accounts for 10-15% of all cases and out of these, Hand affliction is seen in 10% of the patients [2]

This uncommon occurrence leads to tuberculosis being kept low in the list of differentials while treating a patient presenting with atraumatic pain and swelling in the hand. This causes a delay in the diagnosis of tuberculosis of the hand and leads to a sub-optimal functional outcome even after seemingly adequate treatment. The purpose of our study is to bring to light the varied clinical manifestations of tuberculosis and its presentation in hand emphasize on the importance of early diagnosis and timely management for a better functional outcome, especially in a country that is endemic for tuberculosis.

### Methods:-

This study was a retrospective, observational study in which, all patients who presented to the out-patient department of a tertiary care teaching hospital between January 2020 to January 2022 with suspected tuberculosis of the hand were included. A detailed history and clinical examination of the patient was done at the time of presentation. Routine laboratory tests, including complete blood count, Erythrocyte Sedimentation Rate, liver and kidney function tests were done. Digital radiographs were done with Antero-posterior and Oblique views of the affected hand; Magnetic Resonance imaging was done to ascertain the soft tissue extent of the disease. All suspected patients were subjected to X-ray of the chest to assess any active or quiescent primary pulmonary lesion. Suspected clinico-radiological cases were confirmed via either Fine Needle Aspiration or Biopsy thus obtaining a histopathological diagnosis. Nucleic acid Amplification Testing (CBNAAT) was done in order to get a molecular confirmation of the diagnosis and a status of the antibiotic resistance status of the bacterium. A diagnosis of tuberculosis was made in patients with histopathological features or those that showed a positive CBNAAT result. All patients with a confirmed diagnosis were treated with anti-tubercular chemotherapy with an Intensive phase of two months (HRZE) and a continuation phase of 10 months (HRE) as per the National Tuberculosis Eradication Programme guidelines with the appropriate dose according to the patient's weight. Splinting of the affected part was done in the functional position of the hand during the acute phase to help alleviate the pain and muscle spasm. Surgical intervention like Incision and drainage / debridement was done for the patients with lesions which did not respond to drug therapy for a minimum of four to six weeks. Patients were followed up at one month, three months, six months and one year to assess radiological improvement and functional scoring was done as per Green-O'Brien score. The patients were monitored for any side effects during the course of anti-tubercular drug therapy. In addition to timely start of the drug therapy, early physical therapy in the form of active and active assisted exercises were done to accelerate the rehabilitation process and improve the overall outcome.

### Results:-

A total of 11 patients were included in our study out of which seven were male and four were female with ages ranging from 19-58 years. The Metacarpals (four patients) were involved most frequently followed by the Phalanges (three patients). Involvement of the soft tissues was seen as tenosynovitis, synovitis of the metacarpophalangeal joints and in one case as a non-healing wound over her index finger (Fig.1). Pain and swelling were the most common presenting complaints and a discharging sinus was the second most commonly encountered presenting symptom. Radiological evaluation showed zone of lysis in the juxta-articular region and involvement of the soft tissues (Fig.2). One patient presented with a non-healing ulcer over her index finger with history of human bite and responded well with conservative treatment with ATT as per NTEP guidelines. 10 out of 11 of our patients (91%) responded to conservative treatment with pharmacotherapy including Anti Tubercular drugs (Fig. 3). One patient who had presented to us after a duration of four months from the onset of complaints, and taken treatment from local medical practitioners in the interim period, developed a palmar abscess in addition to the involvement of the 3<sup>rd</sup> and 4<sup>th</sup> metacarpals, it was for this patient, an Incision and Drainage of the abscess was required in addition to the drug therapy. The mean Green-O'Brien score was 52 (mean) at the time of presentation which improved to a mean of 88 on the last follow up visit.

Sno.	Age/Sex	Part of hand affected	Duration of complaints (Months)	Diagnostic modality	Duration of Follow up	Treatment	Outcome*
1.	30 Years/Male	4 <sup>th</sup> Metacarpal Left	2	Radiographs+ FNAC+CBNAAT	12 months	Conservative	Good
2.	46 Years/ Male	Synovitis 2 <sup>nd</sup> MCP Joint Left	1	Radiographs + MRI + FNAC+ ZN Stain	14 months	Conservative	Good

3.	12 Years/ Female	Proximal Phalanx of index finger Right	3	FNAC + ZN Stain + CBNAAT	12 months	Conservative	Good
4.	52 Years/ Male	Distal Phalanx Ring Finger Left	2	Radiographs + Core Biopsy	16 months	Conservative	Good
5.	27 years/ Female	Non-healing ulcer over right ring finger with middle phalanx of ring finger	2	Radiographs + ZN stain + CBNAAT	12 months	Conservative	Good
6	48 years/ Female	Palmar abscess with tubercular osteomyelitis of 3 <sup>rd</sup> and 4 <sup>th</sup> metacarpals	4	Radiographs + FNAC+ CBNAAT	18 months	Debridement + Anti Tubercular Drug Therapy	Good
7.	19 Years/ male	3 <sup>th</sup> Metacarpal Right	3	Radiographs+ FNAC	14 months	Conservative	Good
8.	22 Years/ Female	Proximal Interphalangeal joint synovitis	1	Radiographs+ FNAC+ CBNAAT	12 months	Conservative	Good
9.	36 Years/ Female	Flexor tenosynovitis of middle finger right	2 weeks	MRI + FNAC+CBNAAT	12 months	Conservative	Good
10.	41 Years/ Female	2 <sup>nd</sup> Metacarpal	3	Radiographs + FNAC+CBNAAT	16 months	Conservative	Good
11.	50 Years/ Male	Middle Phalanx middle finger right	1	Radiographs+ FNAC+ ZN Stain	12 months	Conservative	Good

**Table 1:-** Summary of the patients included in our study and their results.

\*As per Green O'Brien scoring Excellent: 90-100, Good: 80-89, Fair: 65-79, Poor: <65 points

## Discussion:-

**Table 2:-** Tabulation and comparison of similar studies, their methodology and follow up.

S no.	Study	Number of cases	Follow up period	Treatment modality	Results
1.	Kotwal et al. [3]	32	22.4 months	Conservative -75% Surgical- 25%	Final mean Green O'Brien score: 90.5
2.	Wang et al. [4]	15	46 months	Conservative and surgical management	Complete resolution of clinical symptoms
3.	Benchakroun et al. [5]	11	48 months	Conservative management + Surgical management in select cases	Functional outcome not quantified and disclosed
4.	Mohd Altaf Mir et al. [3]	5	Not disclosed	Surgical management	Not Disclosed
5.	Sbai et al. [6]	6	Not disclosed	Conservative management	Good
6.	Ozceliket al.[7]	3	16-26 months	Conservative management	Functional outcome not quantified and disclosed

7.	Wang et al (8)	Single case report	Not disclosed	Surgical management	Satisfactory
8.	Tendulkar et al. (9)	Single case report	Not disclosed	Surgical management	Regained pain free full range of motion
9.	Subasi M et al (10)	7	30.28	Conservative	Satisfactory

Osteo-articular tuberculosis forms 5% of all tubercular infections [9]. As the disease has an insidious onset and a slow albeit destructive course, it is imperative that it is detected and treated early. Typically, due to the indolent nature of the infection, diagnosis and treatment are delayed resulting in increased morbidity and mortality [11]. A late diagnosis leads to a poor outcome even in the presence of drug therapy [5].

In our study of 11 patients, we came across seven male and four female patients showing a predilection for males. The mean age at presentation was 34.9 years. A similar trend is seen in the study done by Mohd Altaf Mir et al. who reported three males and two females with an average age of 44.75 years [2]. While pain and swelling were the most common presenting symptoms, we encountered a discharging sinus in 3 (27%) of our patients while one patient (9%) presented with a non-healing ulcer. Presence of constitutional symptoms i.e. evening rise of temperature, anorexia and weight loss was documented in six subjects (55%) and this correlated with the presence of an infection which is deeper than the cutaneous layers of the skin [12]. This was seen predominantly in cases with tubercular osteomyelitis of the metacarpals, tubercular dactylitis and in cases that presented late and with formation of an abscess. According to Tuli SM et al, tuberculous of the fingers is typically seen in the phalanges and interphalangeal joints and is said to be uncommon after five years of age due to the lavish blood supply of these tubular bones in childhood allowing of the lodgment of the first inoculum [13]. In our study, we encountered three cases with an involvement of the phalanges all of whom were older than five years of age. Since tuberculosis of the phalanges and metacarpals can mimic bone tumors [11], our treatment was started only after histopathological diagnosis or a positive report of the Nucleic Acid Amplification Test. Treatment was done as per the National Tuberculosis Eradication Programme where Isoniazid, Ethambutol, Rifampicin and Pyrizinamide were given two months of intensive phase in a fixed dose combination as per the body weight of the patient [14]. In cases which did not respond to chemotherapy in four weeks, decision was taken to debride the affected area and lower the bacterial load while continuing the Drug therapy. This was seen in one of the cases in our study. Moreover, the patient was found to have a long-standing history of uncontrolled Diabetes Mellitus - a concomitant comorbid condition which is associated with a poor immune status of the patient. In our study, the mean modified Green-O'Brien score was 64.3 (35-80) at the time of presentation which improved to a mean score of 92.4 (85-95). Kotwal et al. reported a mean score of 58.3 at the presentation and a mean score of 90.5 at the last follow up visit [3].

#### Figures:-



**Fig. 1a:-**

**Figure 1(a):-** 3\*2 cm<sup>2</sup> ulcer present on volar and radial aspect of middle phalanx of ring finger of right hand and hyper granulation seen at the mouth of the sinus.



**Fig. 1b:-**

**Figure 1(b):-** 1.5\*1 cm<sup>2</sup> ulcer present over dorsal aspect of middle finger of right hand.



Fig 2a:-

Fig 2b:-

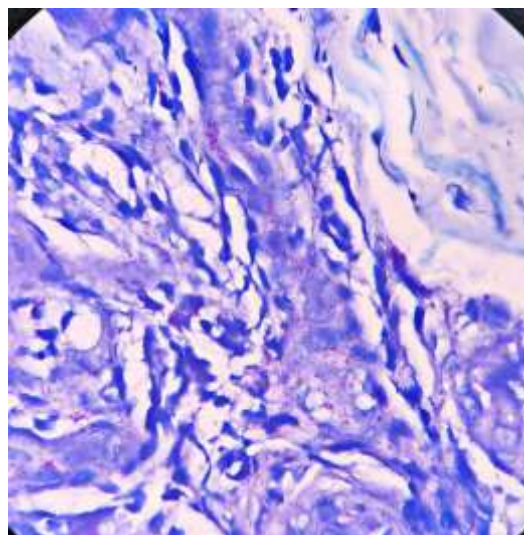


Fig 2c:-

Figure 2. (a) X-ray AP view of the affected digit with appearance of the involved digit showing periarticular zone of lysis.

Figure 2 (b) X-ray lateral view of the affected digit showing lysis of the affected bone and posterior subluxation of the distal interphalangeal joint

Fig 2c Showing histopathological picture with evidence of Acid Fast Bacilli within the skeletal tissue



Fig. 3a:-



Fig. 3b:-



Fig. 3c:-

**Figures 3(a-c):-** Functional outcome at the end of the course of anti-tubercular drug therapy showing good range of motion and complete healing of the discharging sinus.

**Conclusion:-**

Tuberculosis of the hand, has a multitude of clinical presentations and due to this, it can be frequently missed in a clinician's daily practice. But in a country like India, where it is a rampant disease often caught masquerading as

something else due to its various manifestations and indolent course of disease, being even a little amiss will lead to a devastating impact in the outcome of the patient. Even our study, in spite of being time bound and with a relatively small sample size, has made it quite clear that an early detection of the disease, timely start of adequate chemotherapy would lead to a better functional outcome without the requirement of any surgical intervention bringing the overall morbidity of the disease to a minimum.

**Conflict of interest:**

The authors declare that there is no conflict of interest.

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None

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