Original Article

# Tuberculous tenosynovitis: a cause of carpal tunnel syndrome

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## Abstract

**Objective:** To highlight the presentation of tuberculous tenosynovitis as Carpal Tunnel Syndrome (CTS).

**Methods:** A descriptive study conducted with purposive sampling on the patients presenting between April 2004 to January 2005 to the department of Plastic Surgery, CMH Rawalpindi, with the clinical picture of CTS. Symptoms and signs were recorded. The carpal tunnels were explored under nerve blocks. Where tenosynovitis was observed per-operatively, specimen of excised synovium were sent for histo-pathological examination, acid fast stains and bacterial cultures, to ascertain or rule out the presence of tuberculosis.

**Results:** A total of 53 patients predominantly males were included in the study. The median age was 43 years and average duration of symptoms was 9 months. Tenosynovitis was observed in three patients (6%) per-operatively, with histopathology suggestive of Tuberculous tenosynovitis. Point Prevalence of tuberculous tenosynovitis as a cause of CTS was 6%. These patients reported clinical improvement with anti-tuberculosis treatment. NCS/EMG co-related well with clinical relief.

**Conclusion:** Tuberculous tenosynovitis is an uncommon cause of median nerve compression at the wrist. As symptoms are usually typical of CTS, diagnosis is frequently missed. Consideration of the possibility, examination of the opened canal at surgery and proper treatment can result in a successful outcome (JPMA 56:116;2006).

## Introduction

Carpal Tunnel Syndrome (CTS) is a common clinical entity seen in Plastic and Orthopedic Surgery Clinics.[1] It was described first by Paget in 1854.[2] Carpal tunnel is a passage that traverses the wrist between the forearm and the palm. Its volar side is the thick transverse carpal ligament, dorsal floor consists of the volar ligaments of the wrist, and the lateral walls are scaphoid tuberosity and trapezium radially and the pisiform and hamate medially. Carpal tunnel gives passage to tendons of long digital flexors and median nerve. Carpal tunnel syndrome is the compression neuropathy of the median nerve. This compression of median nerve can occur either because of tunnel narrowing or increase in the volume of its contents. Carpal tunnel syndrome is a clinical diagnosis based on thorough history and confirmatory provocative tests. The majority of patients are middle aged[3] with preponderance amongst females[4] and involvement of the dominant hand.[5] The common presentation of CTS is weakness of the hand with sensory disturbances. Symptoms typically aggravate with sleep. There is progression of symptoms, if not treated, and eventually thenar muscles atrophy. The confirmatory provocative tests include Tinel's sign, Phalen's sign, tourniquet test and tenderness over carpal tunnel. Patients in whom conservative treatment fails, surgery is the mainstay of treatment.[6]

CTS is an epidemic in the United States and considered a cumulative trauma disorder as work related compensation is involved.[1,7] Great bulk of cases do not have definite etiology and are termed idiopathic.[8] There are, however, a small number of cases who have an underlying pathology like rheumatoid arthritis, trauma, pregnancy, tuberculous tenosynovitis or tumors.[9]

Tuberculous tenosynovitis is the mycobacterial infection of the tenosynovium of the long flexor tendons at the wrist. The presentation may mimic carpal tunnel syndrome.[10] Importance of this study is to highlight presentation of tuberculous tenosynovitis as CTS in our settings. In such cases the surgical treatment without concomitant anti-tuberculous therapy is not curative. This results in persistence of carpal tunnel syndrome despite multiple surgeries. We present our experience in the management of the patients with Tuberculous tenosynovitis of the flexor tendons who presented with signs and symptoms of median nerve compression at the wrist mimicking the Carpal tunnel syndrome.

## Patients And Methods

A descriptive study was conducted with purposive sampling on all the patients who presented to the department of Plastic Surgery, CMH Rawalpindi, with the clinical picture of carpal tunnel syndrome and positive nerve conduction study. The patients with musculoskeletal disease and / or previous history of skeletal trauma to the affected hand were excluded from the study. The duration of study was 10 months between April 2004 to January 2005.

Each patient was given a serial number and date of presentation was recorded. Patients particulars and history of occupation, dominance of hand, affected hand and previous surgery were documented. In all the patients symptoms (pain, swelling, weakness in hand, paresthesias, association with sleep and fever) and signs (range of motion, Tinnel's sign, Phalen's sign (tingling sensation elicited in hand's median nerve territory on flexion of wrist to 90 degrees), Tourniquet's sign (tingling sensation elicited in hand's median nerve territory within one minute of applying tourniquet to the affected limb), tenderness and crepitus over wrist, were recorded. The carpal tunnel exploration was carried out under nerve block in all patients. Per-operative observations were also noted. In the cases where tenosynovitis was observed per-operatively, specimen of excised hyperplastic synovium(Figure 1) and caseous material including "melon-seed bodies" (Figure 2) were sent for histo-pathological examination, acid fast stains and bacterial cultures, to ascertain or rule out the presence of Tuberculosis. The patients who were found positive for Tuberculous tenosynovitis were treated accordingly. In all the patients the hands were splinted for a week and were followed by physiotherapy.

## Results

A total of 53 patients were included in this study out of which 34 were males and 19 were females, with a male to female ratio of 1:1.7. Four patients (7.5%) had previously undergone carpal tunnel release elsewhere and now had recurrence of symptoms. The median age was 43 years (range 28-52 years) and the average duration of symptoms was 09 months (range 2-25 months). Tenosynovitis was observed in three patients (3/53, 6%) per-operatively and a diagnosis of Tuberculous tenosynovitis was suggested on histopathology in these three (3/53, 6%) cases while bacterial culture grew Mycobacteria in two out of three patients (2/3, 67%). All these three patients were males and they had positive Tinnel's and Phalen's signs along with crepitus over the wrist while one (1/3, 33%) of them had a non-healing discharging wound of the previous surgery. Data analysis showed that the Point Prevalence of tuberculous tenosynovitis as a cause of CTS was 6%. The patients were started on four drug anti-tuberculosis treatment which was continued for nine months. Two patients (2/3, 67%) had evidence of pulmonary tuberculosis on Chest Roentgenograms. There was no evidence of tuberculosis at any other site. All three patients reported an improvement in symptoms which has been maintained in follow-up. Repeat NCS/EMG studies co-related well with clinical relief. One patient (1/3, 34%) did not recover full function in thenar musculature .There were no serious complications but one patient (1/3 , 34%) developed tendon tethering in the palm which required tenolysis.

**Figure 1.** Excised hyperplastic synovium.

**Figure 2.** Melon-seed bodies.

## Discussion

Carpal Tunnel Syndrome is a very common problem and the majority of cases are of the idiopathic variety. Since carpal tunnel release is apparently a simple procedure, it is frequently performed by Junior Staff in most departments. If performed under local anesthesia, the swelling of the tissues, pressure of time and inexperience can combine to prevent the operator from perceiving any abnormalities in the canal.

In our study all the patients diagnosed as Tuberculous tenosynovitis on histopathology, had been operated upon previously for carpal tunnel release. The duration of symptoms suggests that the underlying tuberculous process would have been active at the time of initial surgery. Since a simple release was performed without an attempt to elucidate an underlying pathology, the patients symptoms persisted despite a temporary amelioration.[10] This delay in diagnosis

has also been observed by other authors.[11] This is understandable since Tuberculosis is an uncommon disease in the in the Developed world today.[12] In the developing world, however, it remains rampant. This fact is also highlighted when we compare the prevalence of Tuberculous tenosynovitis as a cause of CTS in our study and that reported in western literature[13], which is less than half to our results. Besides the more common pulmonary variety, tuberculosis frequently affects the lymph nodes, the G.I.T, the G.U.T, bones, Joints, and the soft tissues.[14] For surgeons working in a region where Tuberculosis is common, it is a good policy to keep this possibility in mind when confronted by any thing out of the ordinary.

Recurrence of symptoms after carpal tunnel release should not always be put down to improper initial surgery.

There are some features, which may alert the clinician to the probability of tuberculous tenosynovitis in a patient with CTS. Younger age at presentation especially in males may be significant as the usual patient is middle aged and commonly female. A swelling over the distal wrist or the palm with a "shifting crepitus" is fairly typical of tuberculous tenosynovitis.[6] A discharging sinus may also be an important clue.

As reported by Bush et al, and various other authors we found that a radical excision of all involved synovium and removal of necrotic tissue plus all melon-seed or rice bodies followed by anti tuberculous therapy was curative.[15-17] Extensive post-operative physiotherapy is essential if tendon adhesions are to be prevented[17]. If tenosynovitis is observed per-operatively, a surgeon should keep tuberculosis as an etiology in his mind to treat accordingly thus preventing the persistence of disease.[10,17]

## Conclusion

Tuberculous tenosynovitis is an uncommon cause of median nerve compression at the wrist. As symptoms are usually typical of CTS, diagnosis is frequently missed. Consideration of the possibility, examination of the opened canal at surgery, proper laboratory investigations and treatment accordingly can result in a successful outcome.

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