



## Treatment algorithm in synovial tuberculosis of the hand and wrist: a report of three cases

### *El ve el bileği yerleşimli sinovyal tüberkülozda tedavi planı: Üç olgu sunumu*

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Bu yazıda biri el, ikisi el bileğinde sinovyal tüberküloz saptanan üç olgu sunuldu. Olguların hiçbirinde pulmoner tüberküloz ve ailede tüberküloz öyküsü yoktu. Hastalara tüberküloz tedavisine başlama kararı pozitif histolojik sonuçlar sonrası verildi. Alınan kültürlerde üreme olmadı. Uygulanan 12 aylık kombine antitüberküloz kemoterapiyle olguların tümünde semptomlar geriledi ve iyileşme sağlandı; 16-26 ay arası takiplerde hastalığın herhangi bir bulgusu tekrarlamadı. Klinik gözlemimiz tüberküloz tenosinovit olgularında antitüberküloz kemoterapi uygulanarak iyileşme sağlanabileceği yönündedir.

**Anahtar sözcükler:** Antitüberküloz ilaç/terapötik kullanım; el/ patoloji; sinovit/patoloji; tüberküloz, osteoartriküler/patoloji/ tedavi; el bileği/patoloji.

Three patients with synovial tuberculosis are presented. Involvement was in the hand in one patient, and in the wrist in two patients. None of the patients had pulmonary tuberculosis or a family history of tuberculosis. Tuberculosis treatment was initiated only after histologic verification. The cultures remained negative. The patients received a 12-month course of multidrug chemotherapy for tuberculosis, resulting in symptomatic improvement and healing. There were no recurrences during a follow-up period of 16 to 26 months. Our clinical observations showed that tuberculosis tenosynovitis benefited well from antituberculosis chemotherapy.

**Key words:** Antitubercular agents/therapeutic use; hand/pathology; synovitis/pathology; tuberculosis, osteoarticular/pathology/therapy; wrist/pathology.

Majority of the non-pulmonary tuberculosis are seen in musculoskeletal system. It is a chronic and progressive disease that mostly affects weight bearing joints.<sup>[1, 3]</sup> Upper extremity presentations are not common<sup>[2, 4]</sup> and diagnosis may be late with an unusual clinical picture.<sup>[1, 5]</sup> Three patients with synovial tuberculosis of hand and wrist and their diagnosis and treatment will be evaluated.

### Case report

**Case1–** A 55 year old female patient presented with a slowly growing painless mass in third finger of the right hand. The swelling started two years ago

in the third finger but expanded to midpalmar area by time. There has been a continuous discharge from the fistula in the dorsal aspect of the finger. There was no history of tuberculosis in the patient and her family. Clinical examination revealed a painless swelling in palmar and dorsal aspect of third finger and in the course of flexor tendon sheath through midpalmar area. There was a serous discharge from the fistula in the dorsolateral aspect of third finger. There was no pain, sensory loss or vascular compromise but the joint movements were restricted due to swelling. There was no sign of pulmonary tuberculosis in clinical examinations and chest x-rays. The

x-rays of the hand showed nothing more than soft tissue edema. MRI revealed a synovial lesion surrounding flexor tendons of third finger from distal aspect of flexor retinaculum to middle phalanx. The heterogeneous lesion was enhanced with contrast injection and composed of solid and cystic areas (Figure 1). All laboratory tests were normal with a sedimentation rate of 28 mm/hour. The purified protein derivative (PPD) test was positive.

Open biopsy was performed and thickened synovium with many particles like rice was observed. Both the synovium and the particles were biopsied. The results of biopsy showed granulomatous lesions containing multinuclear giant cells with some central necrosis. There were epithelioid fibroblasts and mononuclear inflammatory cells. Histologically the lesion was a tuberculosis lesion. However no acid-resistant bacillus, bacteria or fungus was observed. Aerobic and anaerobic culture results were negative.

Tuberculous tenosynovitis was diagnosed histologically and antituberculous treatment was started (isoniazid, rifampin, pyrazinamide, ethambutol, ). Pyrazinamide and ethambutol was stopped after third month. Antituberculous treatment was continued for nine months with isoniazid and rifampin. The lesion was regressed and the discharge was stopped after six weeks of therapy. In her control in 21'st months of starting of the antituberculosis therapy; there was no limitation of hand or wrist movements and no sign or symptom of disease.

**Case 2**– 21 year old female patient presented with a slowly growing painless mass in her wrist for more than five months. There was no history of trauma or rheumatoid disease. The patient was prescribed many anti-inflammatory drugs and antibiotics before. However the mass had progressively grown and caused a fistula formation in dorsal aspect of wrist that transformed to a ulcerated pseudo-tumor appearance in last month (Figure 1). There was no history of tuberculosis in the patient and in her family. However after research for tuberculosis her husband was found to have pulmonary tuberculosis.

There was a hard nodular ulcerated 4x4cm lesion in dorsoulnar aspect of right hand that was painful on palpation. There was erythema of forearm and axillary lymphadenopathy but no limitation of movements. There was no sign of pulmonary tuberculosis

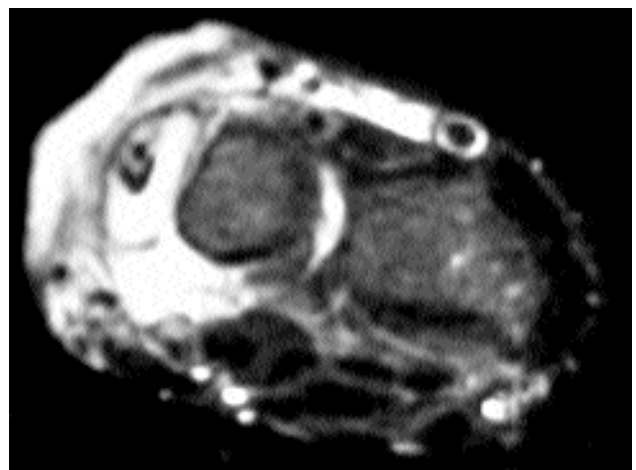
in clinical examinations and chest x-rays. All laboratory tests were normal with a sedimentation rate of 38 mm/hour. The purified protein derivative (PPD) test was positive. The x-rays of the hand showed nothing more than soft tissue edema (Figure 2). MRI revealed thickened synovium of sixth extensor compartment



**Figure 1.** Ulcerative pseudotumoral mass in dorsal aspect of wrist in first presentation .



**Figure 2.** The x-rays of the hand showed soft tissue edema without osseous pathology.

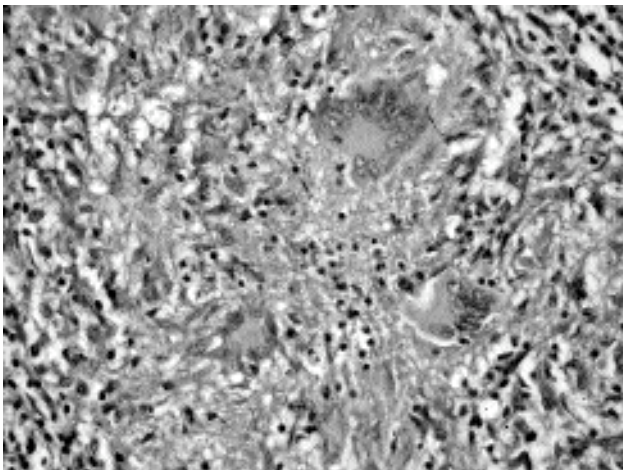


**Figure 3.** MRI revealed thickened synovium of sixth extensor compartment with tenosynovitis that is enhanced with contrast injection.

with tenosynovitis that is enhanced with contrast injection (Figure 3). The biopsy from the ulcerated mass showed central necrosis, granulomatous lesion with multinuclear giant cells, fibroblasts and mononuclear inflammatory cells (Figure 3). The pathological examination showed histological changes compatible with tuberculosis. However microscopy could not find acid resistant bacillus or other bacteria or fungus. Culture results were negative.

The patient was diagnosed as tuberculosis on the basis of histological and clinical settings and antituberculous treatment was started (Rifampin 600mg/day, isoniazid 300mg/day, streptomycin 1gr/day and pyrazinamide 2gr/day).

The yellow-green suppurative discharge increased in the first week of treatment but the lesion regressed. However streptomycin was stopped because the patient had stated that she was pregnant. The pregnancy was terminated and treatment was continued by



**Figure 4.** The biopsy from the ulcerated mass showed central necrosis, granulomatous lesion with multinuclear giant cells, fibroblasts and mononuclear inflammatory cells (H-E x 200).



**Figure 5.** The lesion was totally healed. The view in 26th months.

isoniazid, rifampin, and pyrazinamide. There was a considerable regression of the lesion and relief of the edema after the six week. Pyrazinamide was stopped after third month. Antituberculous treatment continued with isoniazid and rifampin for nine months. In her control in 26<sup>th</sup> months of starting of the antituberculosis therapy; there was no limitation of hand or wrist movements and no sign or symptom of disease (Figure 5).

**Case 3**– 16 year old female patient presented with a painless mass growing in her right wrist for more than 4 years. She could not take a treatment although she consulted to many doctors. The examinations for diagnosis could not start because of official paperwork. There was no history of tuberculosis in her family.

There was a painless mass in volar aspect of wrist in clinical examination. There was no sign of pulmonary tuberculosis in clinical examinations and chest x-rays. All laboratory tests were normal with a sedimentation rate of 26 mm/hour. The purified protein derivative (PPD) test was positive. The x-rays of the hand showed nothing more than soft tissue edema. MRI revealed a synovial lesion surrounding flexor tendons under flexor retinaculum. The heterogeneous lesion was enhanced with contrast injection and composed of solid and cystic areas and abscess formation.

Open biopsy was performed and thickened synovium with particles like rice was biopsied both for histological and microbiological studies. The pathological examination showed histological changes compatible with tuberculosis. Culture results were negative.

The patient was diagnosed as tuberculosis on the basis of histological and clinical settings and antituberculous treatment was started (Rifampin 600mg/day, isoniazid 300mg/day, streptomycin 1gr/day and pyrazinamide 2gr/day). The patient's cooperation was poor during the treatment so streptomycin was stopped. Pyrazinamide was stopped at third month and antituberculosis treatment was continued for nine months with isoniazid and rifampin. In her control in 16<sup>th</sup> months of starting of the antituberculosis therapy; there was no limitation of hand or wrist movements and no sign or symptom of disease.

## Discussion

Non-pulmonary tuberculosis results from hematogenous spread of disease from active or inactive infected organs such as lungs, lymphatics, or other visceral organs.<sup>[4,7]</sup> There was no sign of tuberculosis in chest x-rays and no history of tuberculosis in our cases. Synovial tuberculosis occurs via synovial vessels. The disease is slowly progressive if it started as synovial tuberculosis. Expansion and edema of synovial membrane is observed. There were rice-like particles composed of fibrinous necrotic material.

The diagnosis of hand and wrist tuberculosis may be late because of atypical localization and atypical clinical picture. There may be edema and mass in superficial joints even in the early periods of disease<sup>[8]</sup>. Painless progressive swelling through tendons even without any other systemic sign or evidence must remind tuberculosis.<sup>[4, 5, 9, 13]</sup> The patients mostly are seen in late phases of disease and with high morbidity due to late diagnosis.<sup>[5,13]</sup> There were no predisposing factors in our cases for atypical mycobacterium disease.

Lymphocytosis, decreased hemoglobin and increased sedimentation rate may be observed. Montoux test will take one month to be positive. A negative result in a immunocompetent patient will prove that the patient has no tuberculosis.<sup>[7]</sup> Plain x-rays must be taken to rule out bony involvement. Involved areas will show osteoporosis and soft tissue edema.<sup>[5]</sup> Enhancement with contrast injection in MRI is helpful in diagnosis of chronic tenosynovitis and tuberculosis. Contrast injection will reveal the extent of mass and synovial thickening.<sup>[5,9]</sup> The patients with tuberculous tenosynovitis are always mis-diagnosed as nonspecific synovitis or rheumatoid synovitis. The rice-like particles in rheumatoid arthritis are smaller than the ones in tuberculosis. Specimens must be taken for both pathological and microbiological studies. The diagnosis can be settled by either positive histology or by positive culture results.<sup>[3,5,14,15]</sup> The decision to start chemotherapy can be made by results of histology that are usually available 5 or 6 days after biopsy. However culture results must be followed and results may take six to eight weeks also there may be false negative results.

[2, 4]

The specimens must be tested for acid resistant bacillus and other bacteria. The microscopy results are usually negative in extrapulmonary tuberculosis. However negative microscopy does not rule out tuberculosis.<sup>[5, 16]</sup>

Surgical debridement is controversial.<sup>[4,7]</sup> There are studies proposing surgical debridement.<sup>[4,11]</sup> It is stated that surgical debridement should be performed in patients who do not respond to four or five months of chemotherapy.<sup>[7]</sup> Any surgical debridement must be planned after a period of chemotherapy because chemotherapy before the surgery prevents dissemination of the disease as millitary and meningeal tuberculosis and also prevent bony destruction in joint involvements.<sup>[5,7,13]</sup> Multidrug chemotherapy must be continued for 9 or 12 months. The results are excellent in extraarticular and synovial involvements.<sup>[1,2,5,17]</sup>

It must be remembered that tuberculous lesions may be in atypical locations. Slowly growing painless synovitis must remind tuberculosis. Any surgical debridement after biopsy must be planned after a period of chemotherapy. Wide surgical debridement must be performed if chemotherapy fails in treatment.

## References

1. Hunfeld KP, Rittmeister M, Wichelhaus TA, Brade V, Enzensberger R. Two cases of chronic arthritis of the forearm due to Mycobacterium tuberculosis. *Eur J Clin Microbiol Infect Dis* 1998;17:344-8.
2. Skoll PJ, Hudson DA. Tuberculosis of the upper extremity. *Ann Plast Surg* 1999;43:374-8.
3. Ertürer RE, Tezer M, Özçelik B, Öztaş S. Pott hastalığı. *Heybeliada Tıp Bülteni* 2003;9:37-43.
4. Bush DC, Schneider LH. Tuberculosis of the hand and wrist. *J Hand Surg [Am]* 1984;9:391-8.
5. Özçelik B, Öztaş S. Sinovyal tüberkülozda genel prensipler: Tanı ve tedavi yaklaşımları. *Heybeliada Tıp Bülteni* 2003;9:36-7.
6. Robins RH. Tuberculosis of the wrist and hand. *Br J Surg* 1967;54:211-8.
7. Tuli SM. General principles of osteoarticular tuberculosis. *Clin Orthop Relat Res* 2002;(398):11-9.
8. Visuthikosol V, Kruavit A, Nitiyanant P, Siriwongpairat P. Tuberculous infection of the hand and wrist. *Ann Plast Surg* 1996;37:55-9.
9. Sueyoshi E, Uetani M, Hayashi K, Kohzaki S. Tuberculous tenosynovitis of the wrist: MRI findings in three patients. *Skeletal Radiol* 1996;25:569-72.
10. Lakhanpal S, Linscheid RL, Ferguson RH, Ginsburg WW. Tuberculous fasciitis with tenosynovitis. *J Rheumatol* 1987; 14:621-4.
11. Cramer K, Seiler JG 3rd, Milek MA. Tuberculous tenosyn-

- ovitis of the wrist. Two case reports. *Clin Orthop Relat Res* 1991;(262):137-40.
12. Esenyel CZ, Bulbul M, Kara AN. Isolated tuberculous tenosynovitis of the flexor tendon of the fourth finger of the hand. Case report. *Scand J Plast Reconstr Surg Hand Surg* 2000;34:283-5.
  13. Ellis ME, el-Ramahi KM, al-Dalaan AN. Tuberculosis of peripheral joints: a dilemma in diagnosis. *Tuber Lung Dis* 1993;74:399-404.
  14. Hodgson AR, Smith TK, Gabriel Sister. Tuberculosis of the wrist. With a note on chemotherapy. *Clin Orthop Relat Res* 1972;(83):73-83.
  15. Yao DC, Sartoris DJ. Musculoskeletal tuberculosis. *Radiol Clin North Am* 1995;33:679-89.
  16. Jensen CM, Jensen CH, Paerregaard A. A diagnostic problem in tuberculous dactylitis. *J Hand Surg [Br]* 1991;16:202-3.
  17. Özçelik B, Öztaş S. İzole el üçüncü parmak fleksör tendon tüberküloz sinoviti. *Heybeliada Tıp Bülteni* 2003;9:54-6.