



## Case Report

## Tuberculous Arthritis of the Ankle Associated With Recurrent Ankle Sprain

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### Abstract

Tuberculosis of the ankle is an uncommon presentation of extrapulmonary infection. The early diagnosis of tuberculous arthritis of the ankle is difficult because of the uncommon site, the ability of tuberculosis to mimic other disorders and, all too common, lack of awareness of this infection by the physician. Here, we report the case of a 14-year-old boy with an unusual presentation of tuberculous arthritis involving the ankle joint. The patient, despite a period of conservative treatment, presented with a localized painful swelling of the ankle associated with recurrent ankle sprain. Tuberculous arthritis was diagnosed through a surgical procedure, and antituberculous therapy eventually eradicated the infection. It is highly recommended that early open biopsy and synovial fluid culture be performed in suspicious cases because early diagnosis is the key to successful treatment. (*Tzu Chi Med J* 2010;22(4):209–212)

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## 1. Introduction

Although the prevalence of *Mycobacterium tuberculosis* infection in Taiwan has increased in recent decades, tuberculous arthritis is still an uncommon disease but has been predominantly observed in elderly males (1). The microorganism usually spreads via the bloodstream to the synovium in tuberculous arthritis. The large joints, such as the knee and hip, are most commonly affected, although any articular site can be involved. Monoarticular disease is the rule, although polyarticular disease has also been reported (2). The subsequent infection causes articular cartilage destruction, resulting in chronic joint morbidity.

Ankle sprain is a common presentation in the emergency department or outpatient clinic and is

commonly associated with lateral ankle swelling following traumatic events. Diagnosis of ankle sprain is largely based on the clinical presentation. Because repetitive ankle sprain is common, the underlying problem may be overlooked by not only the patient himself but also by the treating physician, which may result in the delayed diagnosis of the underlying disease. Here, we describe an uncommon case of tuberculous arthritis involving the ankle joint associated with recurrent ankle sprain.

## 2. Case report

A previously healthy 14-year-old boy presented with a 5-month history of right ankle swelling. He denied

any history of recent infection but had had recurrent ankle sprain that had been treated by many physicians over a period of about 7 months. When he visited our outpatient clinic, he was afebrile but had swelling of the right ankle when compared to the unaffected side (Fig. 1). There was no skin rash, and the right ankle had almost a full range of motion. Radiographs of the ankle showed soft tissue swelling and a cortical defect at the distal fibula above the distal tibiofibular joint (Fig. 2). Preoperative magnetic resonance imaging (MRI) showed well defined cystic lesions over the distal tibiofibular joint with a mass effect at the medial aspect of the distal fibula and joint effusion of the ankle joint (Fig. 3).

On admission, laboratory findings included a white blood cell count of  $5.6 \times 10^3/\text{mL}$  with 66.3% neutrophils. The erythrocyte sedimentation rate was

20 mm/hr and C-reactive protein was 6.7 mg/L. The laboratory data of renal and hepatic functions were normal.

Because pyogenic arthritis or neoplasm was highly suspected, surgical intervention was suggested. With the patient in a supine position, the distal tibiofibular joint was opened with a longitudinal incision. Some turbid fluid and necrotic caseous material inside the mass was evident at the time of operation (Fig. 4). Another incision was performed anteriorly from the medial malleolus to obtain adequate debridement of the ankle. A connection between the distal tibiofibular joint and ankle joint was found intraoperatively. The distal tibiofibular joint was temporarily stabilized with a cortical screw and the ankle joint was immobilized with a short leg splint. The fluid was sent for aerobic, anaerobic, and fungus cultures. Because tuberculosis



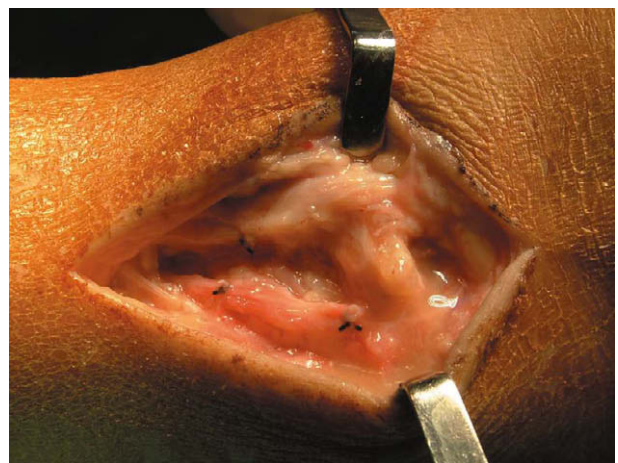
**Fig. 1** — Swelling of the right ankle joint compared to the left.



**Fig. 3** — Sagittal T2-weighted image shows a cyst lesion over the distal tibiofibular joint and fluid in the ankle joint.



**Fig. 2** — Preoperative radiograph of the right ankle shows widening of the distal tibiofibular joint with joint space narrowing of the ankle.

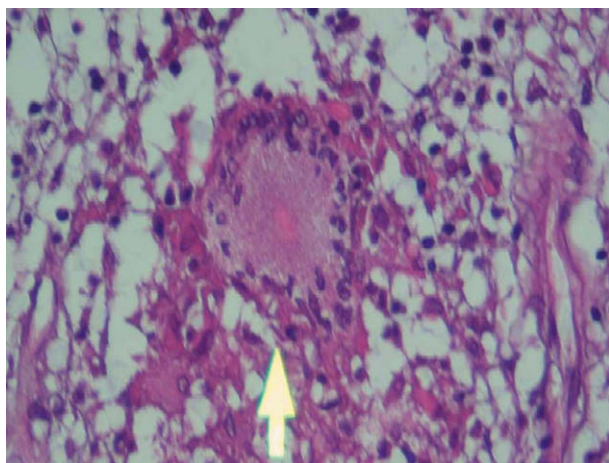


**Fig. 4** — Intraoperative photograph shows caseous material from the distal tibiofibular joint.

infection was suspected, the specimen was also sent for acid-fast stain and tuberculosis culture. Empiric antibiotic treatment with cefazolin and gentamicin was given postoperatively. The acid-fast stain was positive, and four combined antituberculous agents were given for 2 days postoperatively before the culture result was obtained.

Pathological examination was consistent with tuberculosis, showing tubercle formation composed of central caseous necrosis surrounded by epithelioid cells and Langhans giant cells (Fig. 5). Bacterial and fungus cultures from the distal tibiofibular joint and ankle joint were both negative. Cultures of the caseous material of the distal tibiofibular joint and ankle yielded *M. tuberculosis*, isolated 4 weeks postoperatively, and were sensitive to isoniazid, ethambutol, rifampicin and pyrazinamide. Sputum culture for tuberculosis was negative. After 1 week of intravenous antibiotic treatment until the other bacterial culture was negative, and 2 weeks of antituberculous therapy, the patient was discharged from hospital as the wound had healed. The syndesmotomic screw was removed 6 weeks postoperatively. Partial weight-bearing with a protective short leg brace was maintained for 3 months. Four combined antituberculous drugs (ethambutol, isoniazid, rifampicin, and pyrazinamide) were used for 2 months, and then two combined antituberculous drugs (ethambutol and rifampicin) were continued for an additional 7 months in the outpatient clinic.

After 9 months of antituberculous treatment, the affected ankle still had a slight swelling compared to the unaffected ankle, but it had a full range of motion. Follow-up evaluation 2 years later showed no recurrence of infection and no restriction of motion or activity other than occasional pain with exercise, although radiography showed joint space narrowing of the ankle joint.



**Fig. 5 — Photomicrograph shows Langhans giant cells (hematoxylin & eosin, 200×).**

### 3. Discussion

Tuberculous arthritis is an uncommon form of extrapulmonary tuberculosis that occurs in less than 1% of tuberculosis patients (3). Despite the advent of effective chemotherapeutic agents and an improvement in public health measures, pulmonary tuberculosis infection remains a problem in Taiwan (4). The reasons for this increase include the AIDS epidemic and an increase in the number of foreign-born persons in Taiwan (5). In a report of 766 patients, Lin et al found that 3% of the pulmonary tuberculosis patients had extrapulmonary tuberculosis, while 19.6% of extrapulmonary tuberculosis patients also had pulmonary tuberculosis (6). The most frequently involved extrapulmonary tuberculosis sites are the bones and joints. The resurgence of tuberculosis and the emergence of drug-resistant *M. tuberculosis* isolates have had a great impact on public health.

The clinical presentation in tuberculous arthritis of the ankle is variable. The presentation is insidious with mild local signs. Laboratory studies are often of little value. Radiographs in the early stages are often negative except for soft tissue swelling. In the later stages of tuberculous arthritis, bony erosion may occur, producing joint space narrowing. Bone and gallium scans can be used as a screening test to detect multiple sites of bone involvement and, therefore, indicate the sites for further detailed evaluation by computed tomography, MRI or biopsy. Computed tomography is helpful for subtle bone structures and ultrasound for a limited investigation of tendons or evaluation of fluid. MRI is a useful tool to detect pathological changes within the bone marrow and soft tissues because of its ability to provide good anatomical details in many planes. Due to the rarity of this disorder, the fact that the radiological finding was negative in the early stages, and the insidious clinical symptoms associated with recurrent ankle sprains, a delay in recognition of this disease occurred before the patient visited our hospital.

Ankle sprain is among the most common injuries individuals experience during athletic or recreational activities. The amount of time needed for ligament healing after an ankle sprain is unknown (7). A high percentage of patients have repetitive ankle sprain and chronic symptoms after the initial injury. Because ankle sprain is a common disorder in teenagers, a diagnosis based on trauma history and clinical presentation is accurate in most cases. Other studies, including ultrasound, also have a role in the early diagnosis of ligament injury. Our patient demonstrated that the signs and symptoms of tuberculosis were masked by a recurrent ankle sprain.

A diagnosis of extrapulmonary tuberculosis is difficult because of the paucity of these infections.

The polymerase chain reaction is a highly sensitive and specific method for the early detection of *M. tuberculosis* in extrapulmonary specimens. However, the most reliable method of establishing the diagnosis is identification of *M. tuberculosis* by smear test, or in a culture from synovial fluid aspiration or an operative specimen. The organism is not easy to identify in the former, and the latter is time-wasting. Berney et al showed that synovial fluid smears for acid-fast organisms are positive in only 27% of joints with tuberculosis infection (8).

As shown by this and other case reports of tuberculous arthritis, there may be long delays in diagnosis. Inoue et al reported four cases of ankle tuberculosis with an average delay in diagnosis of 5.3 months (9). In our patient, there was no evidence of involvement of the lungs or any other organ by tuberculosis. This is one of the reasons for the delay in diagnosis. The rarity of the problem and the ability of tuberculosis to mimic recurrent ankle sprain combined with a lack of awareness by the treating physician also led to diagnostic delay.

The current treatment of tuberculous arthritis of the ankle depends on the extent of the disease. The main treatment is antituberculous therapy, usually consisting of a combination of isoniazid, rifampicin, ethambutol, and pyrazinamide. A 6- or 9-month regimen may be implemented (10). More prolonged therapy may be necessary depending on the response to treatment. Debridement, synovectomy, or even joint fusion may be required if there has been extensive destructive change. Our patient was initially treated with a combination of four antituberculous agents for 2 months, which was then changed to a combination of two antituberculous drugs for an additional 7 months to salvage the ankle joint. The functional result was good at the time of his 2-year follow-up.

In conclusion, when a patient presents with a localized painful swelling of the ankle associated with recurrent ankle sprain despite a period of conservative treatment, tuberculosis should be considered in

the differential diagnosis. It is highly recommended that early open biopsy and synovial fluid culture be performed in suspicious cases because an early diagnosis is the key to successful treatment.

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