

# Delayed Diagnosis of Tuberculosis Presenting as Small Joint Arthritis – A Case Report

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## ABSTRACT

Small joint arthritis is an uncommon manifestation of tuberculosis. We report a case of tuberculosis presenting as arthritis of the mid-tarsal joints with concomitant spinal involvement. This case illustrates the difficulties in diagnosing tuberculous arthritis as it has an insidious onset, paucity of constitutional symptoms, unremarkable early physical findings and frequent absence of associated pulmonary involvement. A high index of suspicion in high-risk individuals with chronic monoarthritis, is required to avoid delayed diagnosis.

**Keywords:** tuberculosis; small joint arthritis; delayed diagnosis

## INTRODUCTION

Tuberculosis (TB) has now re-emerged as a “global health emergency” with one-third of the world’s population estimated to be infected with the tubercle bacillus<sup>(1)</sup>. Immigration has been identified as the single most important cause of the increase in incidence of TB in developed countries<sup>(2)</sup>. This is pertinent to Singapore as two-thirds of all TB cases occur in Asia<sup>(3)</sup> and the number of guest workers in Singapore from less developed Asian countries has increased.

Before the advent of effective anti-TB chemotherapy in the middle of this century, TB was the most common cause of chronic small joint arthritis and tenosynovitis<sup>(4)</sup>. TB small joint arthritis and tenosynovitis are now less common. The diagnosis is also frequently delayed<sup>(5-7)</sup>.

## CASE REPORT

A 25-year-old domestic helper from Indonesia who had been working in Singapore for a year, presented in January 1997 with pain in her left foot for a few weeks without preceding trauma. Clinical examination did not reveal any abnormality and she was prescribed non-steroidal anti-inflammatory drugs. She did not return for follow-up treatment. Six months later, during a routine periodic health screening for guest workers, she complained of persisting pain. By then, a 1.5 cm doughy swelling that was neither tender nor warm, was evident at the dorsum of the left mid-foot (Fig 1). Aspiration was attempted, but no fluid was obtained.

Plain radiographs of the left foot and chest were done. The left foot radiograph (Fig 2) showed non-



Fig 1 – Photograph showing the doughy, semifluctuant swelling over the dorsum of the left foot. At early stage, this may be mistaken for a ganglion<sup>(4)</sup>.

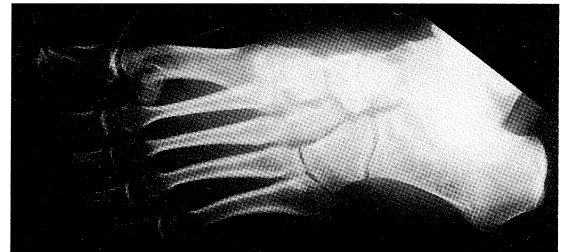


Fig 2 – Plain radiograph of left foot showing marked periarticular osteoporosis at the metatarsophalangeal and interphalangeal joints.

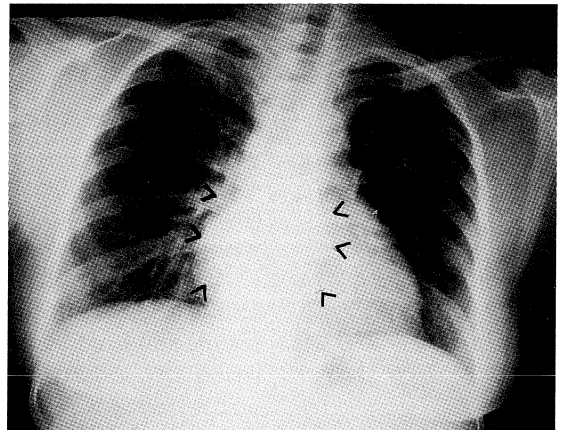


Fig 3 – Chest radiograph, postero-anterior view: the lung fields are clear. However, there are para-vertebral soft-tissue shadows (arrowed) at the level of the lower thoracic vertebrae.

specific but marked periarticular osteoporosis at the metatarsophalangeal and interphalangeal joints. The chest radiograph revealed normal lung fields. However, paravertebral soft-tissue shadows were noted at the level of the lower thoracic vertebrae, consistent with TB cold abscesses (Fig 3). Lateral thoracolumbar spine radiograph showed anterior wedge collapse of vertebral bodies of T7/8 (Fig 4), consistent with Pott’s spine.

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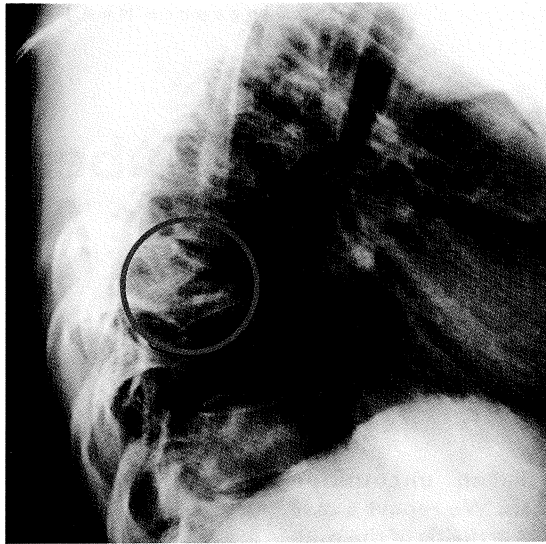
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**Fig 4** – Lateral thoracic-spine radiograph: anterior wedge collapse of the vertebral bodies of T7/8 (Pott's spine).

The patient had no known contact with TB in Indonesia or Singapore and had no cough, night sweats or loss of weight. However, pain was experienced in the upper back on sneezing and the employer noted that she had been more “hunched” the past few months. Clinical examination revealed a gibbus at the level of the lower border of the scapula. There was no myelopathy or radiculopathy. The white blood cell count was normal (total white count 5,600/ $\mu\text{L}$ ; polymorphs 67%, lymphocytes 22%, monocytes 7%, eosinophils 4%) and so was the erythrocyte sedimentation rate (16 mm/hr). Mantoux test was not done.

Curretage and excision biopsy was performed on the foot lesion. Intra-operatively, there was purulent and caseous material exuding from the mid-tarsal joints with oedematous peri-tendinous and muscular tissues. Histology of fascia, muscle and extensor synovium (Fig 5) showed necrotising granulomatous inflammation with epithelioid histiocytes, multinucleated giant cells and surrounding areas of necrosis, consistent with TB. *Acid-fast bacilli* (AFB) were identified on *Ziehl-Neelsen stain*. Smear from pus and excised tissue was negative for AFB and pyogenic culture was negative. However, mycobacterium culture was inadvertently omitted.

Based on the clinical picture and histology results, the patient was started on daily anti-TB regime of ethambutol 1100 mg, isoniazid 300 mg, rifampicin 450 mg and pyrazinamide 1.5 g. She was reviewed two weeks after surgery and given three months' supply of medication together with a referral letter to her Indonesian physician to continue the treatment.

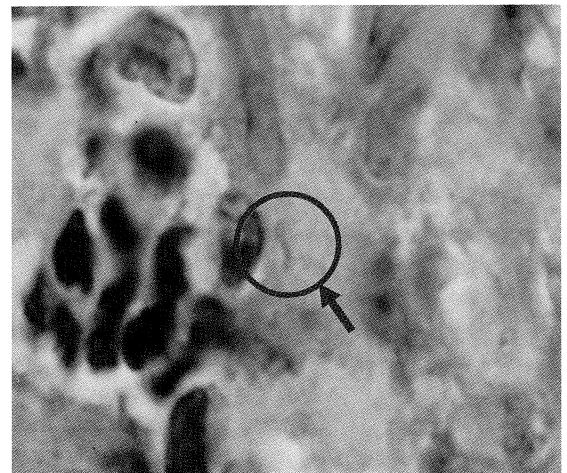
## DISCUSSION

Although the rate of TB in Singapore has remained at 50 to 55 per 100,000 since 1987, there has been a significant 3.5 times increase in the number of cases amongst migrants (from 178 cases in 1985 to 603 cases in 1995<sup>(1)</sup>). Epidemiological surveys in both UK and USA also show that the *proportion* of extra-

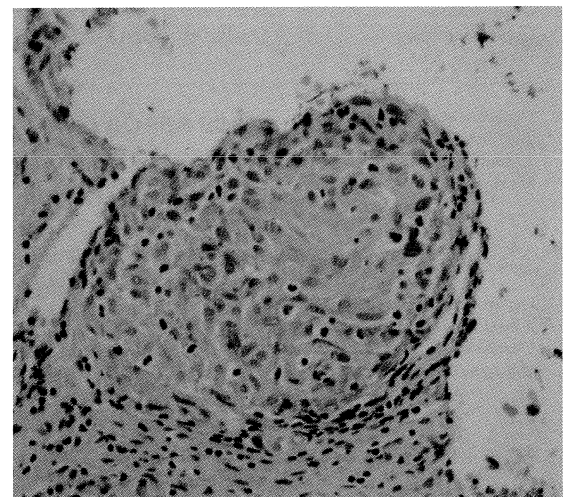
pulmonary cases has increased over the last few decades, especially amongst migrants from high prevalence countries<sup>(8,9)</sup>. These trends suggest that we may encounter more cases of extrapulmonary TB in Singapore.

This patient had skeletal TB involving the spine and the mid-tarsal joints of the left foot. TB arthritis however, occur more often as monoarthritis<sup>(6,7)</sup>. Skeletal TB comprises between 1% to 4% of all cases of TB<sup>(6,7)</sup>. Large weight-bearing joints such as the spine, hip and knee are more commonly involved, followed by the elbow, shoulder and the small joints of the hands and feet in descending order<sup>(7,10)</sup>.

TB arthritis is more destructive than suppurative arthritis<sup>(5,6)</sup>. Unfortunately, there is frequently a delay in diagnosis<sup>(5-7)</sup>. This case report illustrates the clinical features that commonly contribute to the delay. These features are: no pulmonary involvement, insidious onset of symptoms with minimal signs of local inflammation and no early characteristic radiographic finding. Many doctors are also not aware that TB may be a cause of small joint arthritis<sup>(5,8)</sup>.



**Fig 5a** – Photomicrograph of soft-tissue (fascia and muscle) from the left foot: Ziehl-Neelsen stain showing an acid-fast bacillus within an epithelioid macrophage (encircled), appearing red against the blue background. ( $\times 1000$ , oil immersion)



**Fig 5b** – Photomicrograph of tissue from the extensor synovium of the left foot, showing epithelioid granuloma. (H&E,  $\times 400$ )

Bone and joint TB is usually due to reactivation of a haematogenously seeded focus and need not be associated with active pulmonary TB<sup>(7)</sup>. Less than half the cases of bone and joint TB exhibit pulmonary findings<sup>(8,10)</sup>. As most physicians expect active pulmonary involvement in TB, the absence of pulmonary findings as in this case report, can cause a delay in diagnosis<sup>(5,7,8)</sup>.

TB tenosynovitis is associated with antecedent local trauma and is more common in those involved in manual work<sup>(4,6)</sup>. It has been postulated that local trauma with associated micro-extravasation of blood and micro-disruption of tissue architecture may lower local resistance and lead to reactivation of previously seeded foci. Joint pain or swelling therefore may be attributed to simple sprains in such patients with TB tenosynovitis until the duration of symptoms and signs is prolonged. This also contributes to a delay in diagnosis.

Early TB arthritis has no characteristic radiographic findings to distinguish it from non-infectious inflammatory arthritides such as rheumatic arthritis or gout. A radiological analysis by Nathanson & Cohen<sup>(10)</sup> of 200 cases of bone and joint TB concluded that an early radiographic diagnosis was difficult and in many instances, inconclusive.

The diagnosis of TB arthritis requires a high index of suspicion. It also requires identification of high-risk groups, such as migrants from high-prevalence areas, as illustrated in this case<sup>(9)</sup>. Mantoux test, erythrocyte sedimentation rate (ESR) and good-quality plain radiographs with the normal side for comparison are recommended in the routine work-up of persistent monoarthritis in high-risk individuals, even when constitutional or pulmonary signs are absent<sup>(4,6,7)</sup>.

A strongly positive Mantoux test in a patient with persistent monoarthritis warrants evaluation for TB<sup>(8)</sup>. Although a positive result does not always mean active disease, a negative result excludes it in the absence of anergy<sup>(7)</sup>. Though the ESR is commonly raised in TB arthritis, it may be normal, as in this case. The total white count is usually normal in contrast to pyogenic arthritis.

Joint aspiration for analysis and culture (pyogenic as well as mycobacterium culture) together with synovial biopsy for culture and histology should be done before antimicrobial therapy is commenced. Cultures of synovial fluid or membrane are positive in 80% to 90% of cases and synovial biopsy characteristically reveals granulomas in up to 90%<sup>(7)</sup>.

In TB arthritis, treatment may have to be started based on the clinical picture and histological finding of granulomatous inflammation, as mycobacterium culture results are usually ready only six weeks after its collection. Culture is required to confirm the diagnosis, as AFBs are not commonly seen on histology. The antimicrobial sensitivity pattern also influences treatment. In this case, mycobacterium culture of synovial biopsy was inadvertently omitted and the specimens were sent for pyogenic cultures only. This experience illustrates one stumbling block

that can be encountered in the management of TB. Mycobacterium culture must be specified when sending specimens to the laboratory. Fortunately in this patient, the presence of AFB on histology and the Pott's spine confirmed the diagnosis of TB.

Numerous studies have demonstrated repeatedly that a single variable – sputum AFB smear status – strongly predicts the infectiousness of the source case<sup>(12)</sup>. Occasional reports of contagion from patients with exclusively extrapulmonary TB were due to aerosolisation of abscess material<sup>(12)</sup>. It appears that the risk of transmission from TB patients without pulmonary involvement is extremely low.

In conclusion, the diagnosis of TB small joint arthritis is often delayed due to lowered awareness, insidious nature, lack of characteristic early radiographic findings and frequent lack of constitutional or pulmonary involvement. A high index of suspicion is necessary, especially in the context of persistent monoarthritis in a high-risk individual. In TB arthritis without pulmonary involvement, the risk of transmission to contacts is minimal and thus constitutes little threat to public health.

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