A Report of Two Cases of Tuberculous Arthritis of the Ankle

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Tuberculosis (TB) is a major global health problem, and musculoskeletal TB occurs in approximately 10% of extrapulmonary cases. In this article we describe 2 cases of ankle joint tuberculous arthritis. Both of the patients were immunocompromised and presented with chronic pain and swelling. Both patients described a history of antecedent ankle trauma. The clinical presentations were consistent with chronic septic arthritis and were nonspecific as to a particular etiology. The pathology and microbiology results revealed infection with Mycobacterium tuberculosis*. Tuberculous infection of bone and joint must be considered when predisposing epidemiological factors are present to avoid delay in therapy. Further exploration into the relationship of trauma to tuberculosis recrudescence is warranted. Level of Clinical Evidence: 4* (The Journal of Foot & Ankle Surgery 48(4):452–456, 2009)

Key Words: caseous necrosis, ethambutol, immunocompromise, isoniazid, polymerase chain reaction, streptomycin, TB

Tuberculosis (TB) is a major global health problem. A decline in the incidence of TB was observed in the United States at the start of the past century as a result of enhanced efforts by the US Centers for Disease Control and Prevention (CDC) and local health departments to control TB (1). However, the downward trend is mainly among US-born pulmonary cases of TB, whereas the number of extrapulmonary cases remains relatively constant. Bone and joint involvement accounts for approximately 2% of all reported cases of TB, and it accounts for approximately 10% of the extrapulmonary cases of TB identified in the United States. Moreover, in the United States, TB persists primarily as a disease of older adults and immunocompromised hosts. This differs from the distribution of TB in endemic areas, where it primarily affects younger individuals (1–3). The articular form of TB usually presents as monoarthritis with a predilection for weight-bearing joints, including intervertebral joints, hips, knees, ankles, and feet, in descending order of frequency (3–5).

To date, there has been no causal relationship established between preceding new or recrudescent trauma and TB. Although various degrees of trama-related TB have been described casually in past reports, an association between antecedent trauma and infection with TB is not well understood. In this report, we describe 2 cases of ankle joint tuberculous arthritis, both of which were preceded by local trauma, and both of which eluded rapid initial diagnosis.

Case 1

A 53-year-old Indian, diabetic male presented to our emergency department with the complaint of a swollen and painful left ankle. He reported that he had fractured his ankle approximately 8 months before presentation and had not undergone surgical repair. He had become dependent on a walker for ambulation in spite of extensive outpatient treatments and rehabilitation. Pain and swelling gradually worsened over the 2-month period preceding presentation, and 1 day before presentation he noticed purulent drainage from an ulcer

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overlying his ankle. On presentation, he was afebrile, and the physical examination was significant only for a 3-mm ulcer near the left medial malleolus, with underlying fluctuance, edema, and tenderness. Bone could not be probed through the ulcer. His pedal pulses were palpable, and the lower extremity sensorimotor function was intact. Pertinent laboratory tests revealed a white blood cell count (WBC) of 13,000 cells/mm^3, hemoglobin value of 11 g/dL, and a platelet count of 458,000/μL. Neither the erythrocyte sedimentation rate (ESR) nor C-reactive protein (CRP) was performed. His chest radiograph was normal. Radiographs of the ankle revealed bony erosions involving the tibia, fibula, and superior aspect of the talus, with fragmentation and loose, calcified bodies within the joint, consistent with chronic septic arthritis and osteomyelitis (Figure 1). Swab specimens of the foot ulcer for bacterial culture and sensitivity, as well as blood cultures failed to yield any bacterial growth. Treatment was initiated with the administration of empiric antibiotic therapy using piperacillin/tazobactam 2.25 g intravenously every 6 hours, and the patient was taken to the operating room where he underwent surgical debridement and application of an external fixator to stabilize the ankle. Intraoperative bone specimens were obtained, and the initial analysis of the bone fragments demonstrated few WBCs without organisms, and stains were negative for acid-fast bacillus (AFB) and fungi. Pathological inspection of the bone specimens revealed the presence of necrotizing and non-necrotizing granulomas.

Infectious Diseases (ID) consultation was requested for further evaluation. A more detailed historical interview revealed that the patient did not recall having ever been skin tested for tuberculosis with tuberculin-purified protein derivative (PPD). Based on the patient's ethnic background, and underlying diabetes mellitus and the clinical course, the ID consultant made a provisional diagnosis of TB of the bone and joint. Empiric anti-tuberculous (anti-TB) treatment was administered daily, using a combination of rifampin 600 mg orally, isoniazid 300 mg orally, pyrazinamide 200 mg orally, ethambutol 800 mg orally (RIPE), and levofloxacin 500 mg orally, pending final culture results. The patient was discharged from the hospital on directly observed therapy (DOT) by the Department of Health (DOH). Approximately 2 weeks after the surgical debridement, bone mycobacterial cultures grew *Mycobacterium tuberculosis* (MTB). The patient received ongoing outpatient treatment under the care of a podiatric surgeon and the DOH. A follow-up arthrodesis was performed approximately 2 months after the ankle debridement owing to extensive ankle joint destruction with loss of motion. The patient completed an otherwise uneventful 12-month course of anti-TB treatment, and he remained asymptomatic clinically and revealed no evidence of recurrent infection.

Case 2

A 45-year-old Hispanic female presented with a complaint of a swollen and painful left ankle. Her pain began after she had sprained her ankle approximately 3 years before the current admission. Three months following the sprain, she developed an ulcer overlying the medial malleolus, which healed following a course of oral antibiotics. But again 2 weeks later, the pain and swelling recurred and the patient underwent surgical incision and drainage of the ankle. Analysis of bone tissue procured at the time of the incision and drainage revealed granulomatous inflammation with fibrinoid necrosis and a diagnosis of rheumatoid nodule was made. Stains at that time were negative for AFB and fungi. The patient reported treatment for presumed rheumatoid arthritis with steroids, etanercept and methotrexate, however could not recall the precise dosages of these medications. Two weeks before presentation to our emergencey department, the patient noted recurrent ankle pain and swelling that did not respond to oral antibiotics.

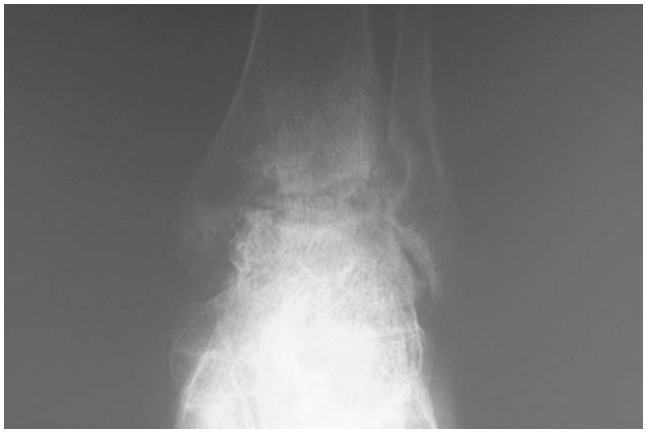

FIGURE 1 Anteroposterior radiographic view of ankle joint showing bone erosions, narrowing of joint space, and complete destruction of tibial plafond.

On presentation, the patient was febrile at 102°F (oral) and the physical exam was significant only for a 3-cm ulcer localized to the left medial malleolus with surrounding edema and fluctuance. Her pedal pulses were palpable, and her lower extremity sensorimotor function was intact. Pertinent laboratory tests revealed a WBC of 5900 cells/mm^3. An ID consultation was obtained. The patient did not recall a history of TB exposure and she initially refused PPD testing. Eventually the tuberculin skin test was performed and demonstrated induration of 15 mm. Her chest radiograph was normal. Computerized tomograms of the ankle joint demonstrated cortical disruption and irregularity of the ankle mortise (Figures 2 and 3). Blood culture specimens failed to yield bacterial growth. She underwent surgical incision and drainage of the septic joint, which revealed caseating material described by the operating surgeon as ''white cottage cheese.'' Intraoperative culture specimens were procured from the bone, and pathological inspection failed to reveal evidence of granuloma. The patient received empiric anti-TB treatment using RIPE, based on the surgical description of the ankle and the positive PPD