

Tuberculous arthritis revisited as a forgotten cause of monoarticular arthritis

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BACKGROUND AND OBJECTIVES: Tuberculosis (TB) continues to be a major concern for health care workers. The number of reported cases of extrapulmonary tuberculosis, particularly osteoarticular tuberculosis, is increasing. This fact is attributed to different factors such as underestimating the disease and difficulty in diagnosis, which requires tissue sampling and can lead to a delay in the diagnosis, and can result in significant morbidity and mortality. The aim of this study was to highlight the difficulties and delay in diagnosis of articular tuberculosis, raising the need to create awareness about the importance of early diagnosis to avoid major complications of joint destruction.

DESIGN AND SETTING: Retrospective review of patients presenting to a tertiary care center between 2003 and 2009.

PATIENTS AND METHODS: We reviewed cases who presented with monoarticular joint pain and swelling that failed to respond to treatment elsewhere and were eventually diagnosed as having articular tuberculosis. We collected the demographic data, history, data on clinical examination and the relevant laboratory investigations, in addition to the data on radiological studies. All patients were treated medically with antituberculosis chemotherapy and surgically according to the severity of joint destruction.

RESULTS: Thirteen patients had a mean age was 40 years (range, 17-70 years). The average delay in diagnosis was 2 years. Only 1 patient had pulmonary TB. The hip, knee and elbow were the most common joints involved. Bacteriology was positive in 69% of the cases; and histopathology, in 92%. Fifteen percent of the patients had arthrodesis. None showed recurrence after follow-up of 4 years.

CONCLUSION: A high level of clinical suspicion is essential for early diagnosis and treatment of osteoarticular TB to reduce its significant morbidity.

Tuberculosis (TB) is still a major public health problem in both developing and industrialized countries. Although the incidence of TB has decreased since the introduction of antituberculous drugs, most developing countries have been facing a resurgence of the disease since 1985. The prevalence of TB is particularly high among patients with AIDS, and the disease is often the first manifestation of HIV infection.¹⁻³ The extrapulmonary manifestations are estimated to occur in approximately 20% of patients with TB.⁴ In Saudi Arabia, Alrajhi et al reported 535 cases of diagnosed and treated TB over a 10-year period. Isolated extrapulmonary TB was identified in 339 (63%) cases.⁵ The incidence of smear-positive tuberculosis in Saudi Arabia was estimated to be 20 per 100 000 of the population.⁶

Extra-axial osteoarticular TB has been most commonly described in the large, weight-bearing joints, like the hips and sacroiliac joints, followed by the knees, ribs, shoulder, ankle, elbow and wrist.⁷ *Mycobacterium tuberculosis* is the main causative organism, and only a few cases are attributable to *Mycobacterium bovis*.⁸ TB of a joint may result from hematogenous dissemination through the subsynovial vessels, or indirectly from epiphyseal (more common in adults) or metaphyseal (more common in children) lesions that erode into the joint space.⁹

Tuberculous arthritis is usually monoarticular and diagnosis is often delayed.^{10,11} The treatment of osteoarticular TB is primarily medical and includes multi-antituberculosis drugs for a period of 9 to 12 months. In the early stages approximately 90% to 95% of pa-

tients achieve healing with near-normal function.^{12,13} We report the diagnostic difficulties and delay in diagnosis of osteoarticular tuberculosis, raising awareness among general physicians and orthopedic surgeons about the importance of early diagnosis in achieving an appropriate successful treatment outcome without complications.

PATIENTS AND METHODS

Our patients were retrospectively identified with medical records reviewed for demographic data, detailed clinical history and physical examination, laboratory investigations, including complete blood count, erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), bacteriological and histopathological examination, and radiological investigation of the involved joints and chest x-ray. All these data, in addition to type and course of treatment (medical and surgical), clinical outcome and follow-up, were extracted from medical records and phone interviews. Informed consent was obtained from all patients in the study in addition to the hospital research ethics committee approval.

We identified patients who presented to the orthopedic clinic in the period from 2003 to 2009 with monoarticular arthritis that failed to respond to treatment in other health care facilities. All these patients presented primarily with joint pain and swelling that failed to respond to medical treatment such as antibiotics or nonsteroidal anti-inflammatory medications and were then investigated at our institute and diagnosed to have tuberculous arthritis, with an average delay in diagnosis of 2 years (range, 6 months to 8 years) from the time they first presented to a health care professional with joint pain. Five of them showed systemic symptoms of fever and night sweat. One patient had a TB sinus.

Radiological studies, including plain x-rays, computed tomography scans (CT scans) and magnetic resonance imaging, were carried out. Final diagnosis was confirmed by microbiological culture and/or histological examinations.

All patients received medical treatment consisting of prolonged (18 months) administration of a combination of 4 antituberculosis drugs. (It is noteworthy that such prolonged treatment is not needed as per the new guidelines. Current recommendation is to administer antituberculosis therapy for a maximum period of 9-12 months.¹³)

RESULTS

In our study, we reviewed 13 cases with a delayed diagnosis of TB arthritis. The mean age of the patients was

Table 1. Characteristics of patients.

	Number	Percentage
Gender		
Male	6	46
Female	7	54
Nationality		
Saudi	5	38
Non-Saudi	8	62
Delay in diagnosis		
6 months	1	8
8 months	1	8
1.0 year	3	23
1.2 years	1	8
1.5 years	2	15
2.0 years	3	23
2.5 years	1	8
8.0 years	1	8
Joint involvement		
Hip	3	23
Knee	3	23
Elbow	3	23
Ankle	2	15
Wrist	1	8
Shoulder	1	8

The mean age was 40 years (range, 17-70 years)

40 years (range, 17-70 years). There were 6 (46%) male and 7 (54%) female patients. Five (38%) were Saudis and 8 (62%) were non-Saudis. The delay in diagnosis, on an average, was 2 years (range, 6 months to 8 years). All patients presented with nonspecific joint pain and swelling, while 5 (38%) patients showed systemic symptoms of fever and night sweat, and 1 (8%) had a TB sinus. One patient had pulmonary TB, and none of our patients had positive HIV serology. Most of the cases involved the hip, knee and elbow joints, followed by other joints, such as the ankle, shoulder and wrist, in that order. Only 1 patient had pulmonary TB. Two patients had diabetes mellitus. None had HIV infection. Joint involvement is shown in **Table 1**. Plain x-ray findings showed soft tissue swelling in 7 patients (54%), bone and joint destruction in 4 (31%) and cysts and calcification in 2 (15%), with computed tomography scan

confirmation in involved cases. MRI studies showed mainly joint effusion and synovitis. Bacteriology was positive in 9 patients (69%) and histopathology was positive in 12 patients (92%).

Eighty-five percent of the patients underwent surgical intervention in the form of incision and drainage, whereas 15% underwent joint fusion. No cases showed no signs of recurrence after a mean follow-up period of 4 years (range, 1 year to 10 years). Surgical intervention with incision, drainage and open synovectomy was resorted to in 11 patients (1 patient had talectomy in addition; 1 had arthroscopic synovectomy), and the remaining 2 had arthrodesis (1 hip joint and 1 wrist).

DISCUSSION

The prevention, identification, treatment and eradication of *Mycobacterium tuberculosis* are significant health concerns, especially because of an increasing incidence and interaction between TB and HIV epidemics.¹⁴ TB infection in its various forms remains a major cause of high morbidity and mortality due to infectious diseases worldwide. Successful treatment in active TB is influenced by establishing an early diagnosis and initiation of an appropriate treatment.⁵ Along with the global increase in the incidence rates of TB, there are reports of an increased incidence of bone and joint TB in all the countries of the world.¹⁵ Osteoarticular TB is found in about 3% to 5% of patients with TB, where 50% of the cases involve the spine; hip and sacroiliac joint, 12% to 15%; knees, 10%; ribs, 10%; shoulder, 7%; ankle, 7%; elbow, 2%; and wrist, 2%.⁷

TB of the bones and joints are the most common extrapulmonary form. Worldwide, of 20 000 cases of extrapulmonary TB, 19% were TB of the bones and joints.¹⁶ Bone and joint TB constituted between 4% and 10% of extrapulmonary TB cases in two large series from Saudi Arabia.^{17,18} In a detailed report of bone and joint TB in Saudi Arabia, El Titi et al reviewed 68 cases in Riyadh that involved the spine in 57% of the cases; the knee was affected in 14%, followed by the hip in 10% of the cases.¹⁶ In our cases also, the hip and knee joints were among the most common joints affected, and this is comparable to what has been reported worldwide and in Saudi Arabia. The diagnosis of osteoarticular TB is often delayed, on an average by 16 to 19 months,¹⁹ and maybe up to 10 years,¹¹ as a result of difficulty in identifying the organism and because the clinical symptoms are nonspecific and with insidious onset that can mimic common joint diseases like rheumatoid arthritis and osteoarthritis.¹⁴ In addition to the fact that some cases showed no systemic symptoms, in one case series 31.5%

of patients with musculoskeletal tuberculosis had no systemic symptoms.¹¹ In our series, there was a delay in diagnosis of 2 years on average (range, 6 months to 8 years), as most of our patients presented with nonspecific joint swelling and pain, and only 5 (38%) patients had systemic symptoms (fever and night sweat). Also, only 1 of them had pulmonary TB, so clinical suspicion of the disease is required in diagnosing these patients. Microbiological examination of synovial fluid was reported to give positive results in 79% of cases;²⁰ and in the El titi et al series from Saudi Arabia, this figure was 60%.¹⁶ Our cases had a similar result, with a positive microbiological examination in 69% of the cases. The histological examinations provided positive results in 92% of the cases, which is comparable to the 91% found in the El titi et al series.¹⁶

In the x-ray findings, there were signs of joint destruction in cases where there was a significant delay in diagnosis. All our patients were treated, as recommended worldwide, with administration of a combination of at least four antituberculosis drugs. In addition to medical treatment, all patients underwent surgery in the form of irrigation, drainage and open synovectomy; 1 patient had talectomy in addition; 1 had arthroscopic synovectomy; and the remaining 2 had hip arthrodesis because of advanced hip destruction, which is actually due to a delay in the diagnosis. It is well known that arthrodesis is an effective procedure, but has consequences on the mobility and function of other joints. Such complications could be prevented by early diagnosis and initiation of proper treatment.

Sidhu et al reported on the results of cemented total hip replacement in 23 patients with active tuberculous arthritis of the hip, with a mean follow-up of 4.7 years.²¹ All patients received at least 3 months of antituberculous therapy before surgery, and treatment was continued for a total of 18 months. No activation of the infection or implant-loosening was recorded, and function of the hip improved in all patients, so they concluded that hip replacement in the presence of active tuberculous arthritis of the hip is a safe procedure when preoperative chemotherapy is commenced and continued for an extended period postoperatively. Neogi et al, reported similar results but in a smaller group of 12 patients.²² Kim et al commented on the difficulty with exposure related to contracted scar tissue and the difficulty with wound healing.²³ We believe that a high level of clinical suspicion is essential for early diagnosis and treatment of tuberculous arthritis to reduce the significant morbidity involved.

In conclusion, the nonspecific, often indolent, clini-

cal presentation of osteoarticular TB, together with its low prevalence and the low index of suspicion among clinicians, may result in delay in its diagnosis. However, prompt diagnosis and treatment of this curable disease remains critical for proper management and preventing joint deformity and permanent bone destruction.

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