Tuberculosiss Arthritis: A Case Report

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Abstract

Tuberculosis Arthritis of the knee joint is rare. A 25-year old female patient presented with pain and swelling of her left knee. The symptoms first appeared two months earlier; she was given glucocorticoid after diagnosed with Rheumatoid Arthritis. The patient did not improve with the treatment. The patient was diagnosed with tuberculosis arthritis according to biopsy and PCR TB result. Biopsy excision of the left knee found granulomatous appearance, which is consistent with tuberculosis, PCR TB examination also found a positive effect. Antituberculosis treatment was started and will be continued for nine months. Tuberculosis arthritis frequently mimics more common etiologies and can be difficult to diagnose. Tuberculosis arthritis may be suspected in a chronic case of joint pain, usually monoarticular, although pulmonary TB may absent.

***Keyword**: Tuberculosis, arthritis, knee, pain*

Introduction

World Health Organization (WHO) declared tuberculosis (TB) as a global emergency since 1993. In 2002, WHO stated that the incidence of TB was 144 in 100.000 people per year with a world population of 6.08 billion people [1]. About 80% of pulmonary TB cases occur in 22 countries, mainly in Southeast Asia, sub-Saharan Africa, and Eastern Europe. In addition to pulmonary TB, there has been a surge in the prevalence of extrapulmonary TB with or without lung involvement in the past 10 years, where 10 to 11% of these extrapulmonary TB cases involve joints and 1 to 3% of these cases involve bones [2,3].

TB arthritis is often presented with several manifestations of subacute or chronic monoarthritis of the weight-bearing joints such as hips, knees, or ankles. This disease has been underdiagnosed for years. The risk factors of TB arthritis are similar to pulmonary TB coupled with the presence of local factors such as pre-existing joint disease including inflammatory arthropathy, crystal arthropathy, joint injury, and surgery. Early diagnosis is required to prevent any delay in the initiation of anti-tuberculosis drugs, thereby reducing morbidity and disability. TB diagnosis requires standard microbiological or histopathological confirmation. Acid-fast bacilli examination of synovial fluid can confirm the diagnosis in only 20-40% cases. Therefore, a synovial biopsy (or other affected tissue) is the gold standard for diagnosing TB arthritis. TB multidrug therapy is not recommended without confirmation. A total of 9 months of treatment for joint and bone TB is supported by some centers [4,5].

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Case Description

A 25-year-old woman presented with complaints of worsening pain in the left knee since three months before hospital admission, accompanied by swelling and movement difficulties (Figure 1).

Additionally, in the following two months, the patient also complained of a fluid-filled lump in the chest. The fluid-filled bump was ruptured, producing

yellowish fluid and pus. The patient denied any respiratory complaint (coughing, hemoptysis, shortness of breath, and chest pain), night sweat, fever, decreased appetite, and weight loss. The patient sought treatment to an internist since the complaint arose and received 8 mg methylprednisolone twice a day, 500 mg calcium carbonate daily, and a capsule of drug combination daily. The patient worked as a salesperson at a souvenir shopping center in Bali. She was a passive smoker. Physical examination revealed swelling and pain during movement on the left knee. Left knee X-Ray showed an impression of joint effusion, soft tissue swelling, and localized osteopenia on the tibial lateral condyle (figure 2).

Chest x-ray examination showed no abnormality. Laboratory tests revealed leukocytosis, increased C-Reactive Protein, and increased erythrocyte sedimentation rate, with negative Rheumatoid Factors (Qualitative RF). Ultrasonography examination found complex joint effusion in the medial compartment of the left knee and left suprapatellar recess with possible synovitis and internal hematoma as well as mild left medial meniscus extrusion. Magnetic Resonance Imaging suggested osteomyelitis in the proximal tibia and distal femur accompanied by Brodie abscess in the medial tibial condyle and septic arthritis. Enhanced chest CT supported mediastinitis appearance on the right superior mediastinum. Excisional biopsy on the left knee showed granulomatous presence, which is consistent with tuberculosis, while synovial fluid was positive on PCR TB. The patient was treated with first line anti-tuberculosis drugs for nine months and followed up clinically.

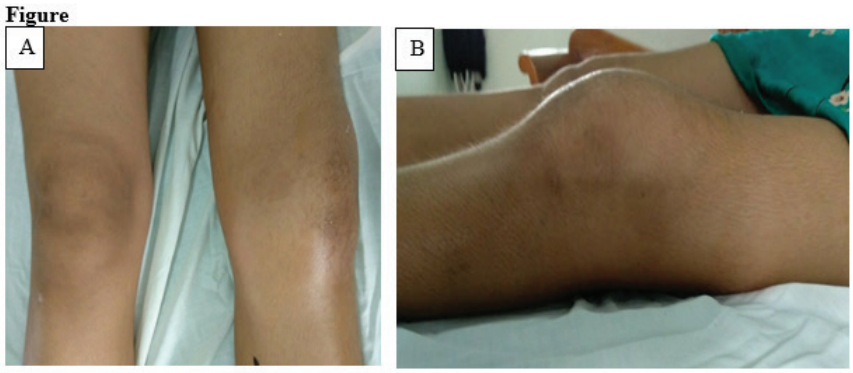

Figure 1. Patient's clinical appearance showed swelling and asymmetry on the left knee seen from anterior posterior (A) and lateral (B).

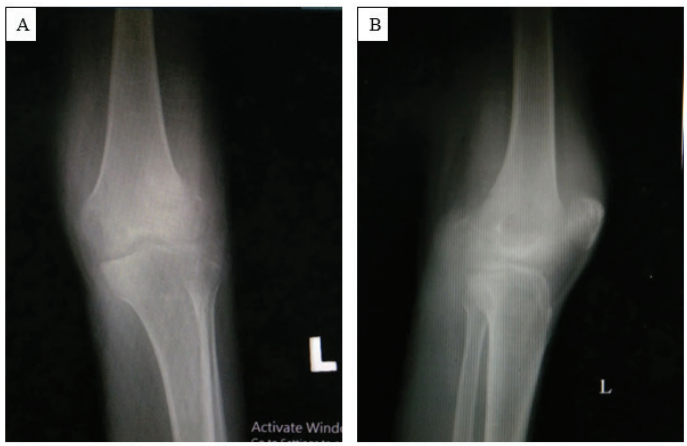

Figure 2. X-Ray (A) anterior posterior and (B) lateral view of the left knee showed an impression of joint effusion, soft tissue swelling, and localized osteopenia on the tibia lateral condyle.

Discussion

Lungs are the central location for TB infection, while skin, digestive tract, tonsil, and placenta are other less common sites for primary TB. Regarding TB arthritis, most infections are due to secondary hematogenous spread via vessels from the primary site. In peripheral diarthrodial TB arthritis, disease originates from adjacent TB osteomyelitis which erodes into the joint space or from direct range to the synovium through the bloodstream resulting in inflammation with edema, muscle spasms, and limited movements. Granulation tissue may cause effusion and pannus formation, which ultimately causes damage to the cartilage. It starts from the edge of the joint eroding into the subchondral cancellous bone, interfering nutrient intake, and loosening the attachment of cartilage to the underlying bone [6]. Severe bone damage can occur following demineralization and necrosis. Cartilage erosion triggers severe muscle spasms with limited joint movement. Imaging in advanced stage shows reduced joint space which is often known as TB arthritis or TB osteoarthritis [4,5,7]. Following this stage, spontaneous para-articular abscesses and external fistula formation occur. The course of tuberculosis synovitis is very typical, and the development of joint damage in TB is much slower than pyogenic infection because mycobacteria do not produce collagenase.

Some conditions have been associated with TB as high-risk factors such as certain socioeconomic classes, immunocompromised hosts, and disturbances in local joints and bone tissue factors. People who use corticosteroid therapy can also be considered as immunocompromised [8]. Other elements of local joints and bone tissue also contribute to the occurrence of TB arthritis. These factors include surgical trauma, intravenous drug usage, and pre-existing joint or bone disease [9]. The patient, in this case, had prolonged use of corticosteroid (methylprednisolone) therapy and osteomyelitis infection (based on MRI) so that the patient became an immunocompromised host, making her more susceptible to TB arthritis. Hips and knees are the most common sites of TB arthritis. Poly/oligoarticular presentation is rare. However, these types should be considered in immunocompromised patients, patients in close contact with TB patients, elder, patients using corticosteroids, or post trauma patients. The early presentations of TB joint are swelling (20%), stiffness (10%), and weakness or limitation of movement. The bones are usually warm and sometimes characterized by thigh muscle atrophy. Synovial hypertrophy and effusion occur in most patients. Muscle cramps and synovial effusion can cause flexion deformity. As the disease progresses, articular cartilage damage occurs coupled with decreased joint space that can lead to its narrowing and irregularity of the cartilage surface. Worsening left knee pain along with swelling and movement difficulties in this patient mimic the symptoms of rheumatoid arthritis, leading to corticosteroid therapy.

Histopathology and microbiology technique remain the gold standards for the diagnosis of TB arthritis and osteomyelitis. Tissue biopsy of representative lesions is the fastest method, one of which is synovial biopsy with more than 90% accuracy. In contrary, synovial fluid smear for TB is positive in only 20-40% cases, while culture can produce positive results in up to 80% cases. Analysis of synovial fluid shows unspecific findings of inflammation, even deficient glucose levels support the diagnosis [10]. Typical radiographic images of TB arthritis are called Phemister triads, characterized by juxta-articular osteoporosis, osseous erosion located at the edges, and gradual narrowing of the joint space. This is different from rheumatoid arthritis and pyogenic arthritis, where joint space narrowing occurs at the beginning of the disease.

The multidrug administration is mandatory because TB bacilli quickly develop into drug-resistant bacilli with different growth patterns between TB bacilli in the same TB location. It is complicated for the TB bacilli to become resistant if two or more drugs are used in combination. The challenge of initial drug resistance can be ignored in TB arthritis due to its small number of microorganisms (10^5-10^6). The optimal duration of therapy for extrapulmonary TB, including TB arthritis, remains unclear. The latest recommendation is nine months of treatment to prevent disability. Second-line drugs are only used for the treatment of TB that is resistant to first-line drugs. TB arthritis treatment outcome is evaluated only by the clinical method. This patient was given first-line drug treatment in the form of 3 fixed-drug combinations (FDC) daily for two months in the intensive phase according to the patient's body weight and was planned to be continued with an

awkward stage for seven months (total of at least nine months). This regimen was by recommendations for joints and bones TB.

Occasionally, surgical intervention is needed with clear indications, such as diagnostic interventions (synovial biopsy or lesions), inadequate response to drug therapy, adequate joint lavage or arthroscopic drainage, bone debridement, aspiration or even drainage (in case of abscess) [6]. As a common rule, multidrug therapy is required for four weeks to stabilize the general condition of the patient before the surgery is performed. At the beginning of the treatment, immobilization can be helpful to eliminate pain and prevent any deformities.

Conclusions

TB arthritis can occur primarily as subacute or chronic monoarthritis of the weight-bearing joints such as hips, knees, or ankles. Back pain with 'spooky' clinical features is another general presentation. The diagnosis of TB arthritis requires standard microbiological or histopathological confirmation. Synovial biopsy (or other affected tissue) remains as the gold standard for TB arthritis diagnosis. TB multidrug treatment is not recommended without a confirmed TB diagnosis.

Conflict of Interest : The authors report no conflict of interest.

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Ethics Statement

All procedures performed in studies/case report were in accordance with the ethical standards of the Ethics Committee in Faculty of Medicine, Udayana University, Bali, Indonesia. The authors explains the aimed, benefits, and rights of the participant during the process of collecting data to the patient's guardian, if the participant agrees we ask the participant to fill out an informed consent sheet.

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