

Received: 2019.01.14
Accepted: 2019.02.04
Published: 2019.04.15

A Case of Knee Monoarthritis Caused by *Mycobacterium Tuberculosis*

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABD 1 **Batool Zamani**
BDEF 1,2 **Mohammad Shayestehpour**

1 Autoimmune Diseases Research Center, Kashan University of Medical Sciences, Kashan, I.R. Iran
2 Department of Microbiology and Immunology, Faculty of Medicine, Kashan University of Medical Sciences, Kashan, I.R. Iran

Corresponding Author: Mohammad Shayestehpour, e-mail: shayesteh2009@yahoo.co.uk
Conflict of interest: None declared

Patient: Male, 35
Final Diagnosis: *Mycobacterium tuberculosis*
Symptoms: Pain • swelling
Medication: —
Clinical Procedure: —
Specialty: Rheumatology

Objective: Challenging differential diagnosis

Background: Skeletal involvement is an uncommon form of extrapulmonary *Mycobacterium tuberculosis* (MTB) that occurs in 1–3% of the patients. Knee joints may be affected in 8% of cases.

Case Report: We reported a case of TB knee arthritis in a 35-year-old Afghan male who was referred to Kashan Rheumatology Clinic for pain and swelling in the left knee. The patient had no history of fever, chills, weight loss, or anorexia. His chest radiography was normal. The synovial fluid culture was positive for *M. tuberculosis*. Magnetic resonance imaging (MRI) of the left knee demonstrated a marked joint effusion, chondromalacia in the lateral patellar facet, and edema in the origin of the gastrocnemius muscle. The histopathologic examination revealed multiple granulomas with foci of necrosis.

Conclusions: This case demonstrated that clinicians should pay particular attention to the possibility of TB as the cause of chronic monoarthritis even when pulmonary involvement is not documented.

MeSH Keywords: Arthritis • Knee Joint • *Mycobacterium tuberculosis*

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/915150>



948



—



2



10



Background

Mycobacterium tuberculosis infection remains a common disease in developing countries. Tuberculosis is one of the 10 leading causes of death worldwide. Every year, approximately 10 million people become infected with *M. tuberculosis*, and death occurs in 1.4 million cases [1]. Although the lung is involved in major cases, the skeletal system can be involved in % 1–3% of tuberculosis patients. The hand, shoulder, foot, knee, and elbow joints may be affected, but the most frequently involved site includes the spine (40%), hip (25%), and knee (8%), respectively [2,3].

Generally, detection of tuberculosis infection in joints is difficult; therefore, the cases of TB knee arthritis are rare and distinguishing them from other inflammatory arthritis is a challenge because of the following reasons: widespread use of antibiotics, atypical clinical presentation, misdiagnosis, low specificity of diagnostic methods or tools, and the un-informed or unknowing clinician regarding tuberculosis epidemiology in the area [4].

Reports have shown that the proportion of extrapulmonary tuberculosis (EPTB) cases is increasing worldwide, but tuberculosis infection rarely involves the knee joint even in countries with a high tuberculosis incidence [5]. We aim to report a case of monoarthritis caused by *Mycobacterium tuberculosis* in a 35-year-old man who referred to a rheumatology clinic with left knee swelling and pain.

Case Report

A 35-year-old Afghan male with a 3-month history of pain and swelling in his left knee was referred to Kashan Rheumatology Clinic in 2018. In this patient, the increased pain was associated with physical activity, and he suffered from morning stiffness lasting 30 minutes. The patient had no history of fever, chills, weight loss, or anorexia, but he did report night sweats. The movement of the joint had gradually decreased, such that the patient was unable to flex the knee. The left knee had flexion contracture of 40° and swelling (3+). The left knee joint was warm and sensitive to touch but had no redness. The results of laboratory tests were as follows: white blood cell count, 7400/mm³; platelet count, 196 000/mm³; hemoglobin level, 14.1 g/dL; erythrocyte sedimentation rate (ESR), 28 mm/hour; C-reactive protein (CRP) level, 71 mg/L; alkaline phosphatase (ALP), 237 U/L; calcium level, 9.7 mg/dL; and potassium level, 4.5 mmol/L. Rheumatoid factor, Wright, Coombs Wright, and 2ME tests were negative. Liquid collected from the left knee was semi clear with normal viscosity. Synovial fluid had 10 000 white blood cell/mm³, 49% polymorphonuclear leucocytes (PMN) and 51% of mononuclear cell. Arthroscopic synovial biopsy and complete synovectomy of

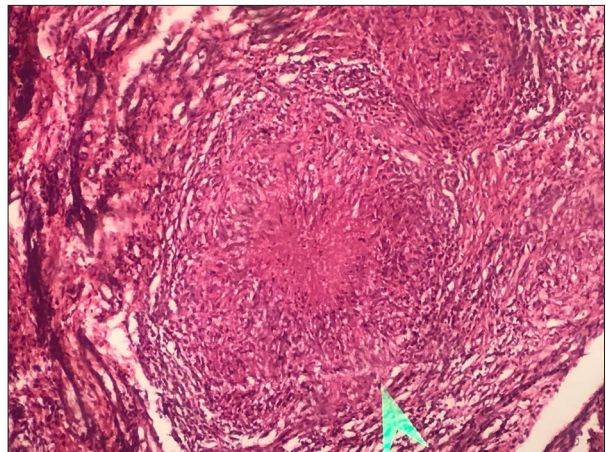


Figure 1. Histopathology slide of synovial tissue revealing multiple granulomas and foci of necrosis.

the knee joint were performed. Synovial tissue and fluid culture was positive and direct smear microscopy was negative for tuberculosis. The histopathologic examination revealed multiple granulomas composed of lymphocyte, histocyte, and multinucleated giant cells. Foci of necrosis was seen in granulomas (Figure 1). Magnetic resonance imaging (MRI) of the left knee demonstrated a marked joint effusion with internal intensities, chondromalacia in the lateral patellar facet, and edema in the origin of the gastrocnemius muscle (Figure 2).

Discussion

We presented a case of monoarthritis caused by *M. tuberculosis* in a 35-year-old Afghan male patient. While extrapulmonary involvements can occur in 25% of tuberculosis cases, primary tuberculosis infection in bone is not common [4]. However, we did not find systemic symptoms of tuberculosis or pulmonary involvement at the time of diagnosis. Based on previous studies, pulmonary tuberculosis has been reported in only around half of tuberculous arthritis cases [5]. Although the incidence of extrapulmonary tuberculosis is increasing worldwide, tuberculosis infection rarely affects the knee joint even in countries with high incidence of tuberculosis [4]. The patient was from Afghanistan where 61 000 people are reported to be infected with *M. tuberculosis* annually and 12 000 deaths occur. Incidence of *M. tuberculosis* infection in Afghanistan is 189 cases per 100 000 people. In 2017, the World Health Organization (WHO) reported that tuberculosis was increasing in Afghanistan due to a poor healthcare system [6].

The diagnosis of tuberculosis arthritis is difficult, because the symptoms are usually nonspecific such as swelling, pain, warmth, redness, and joint motion limitation. Diagnosis is usually based on the following manifestations and laboratory findings: painful swelling in joint, increasing acute phase of



Figure 2. Knee magnetic resonance imaging (MRI) showing a joint effusion.

inflammation markers (ESR and CRP), and positive *M. tuberculosis* culture in synovial fluid or biopsy [7]. The radiographic Phemister triad including a combination of periarticular osteopenia, subchondral erosions, and joint space narrowing is not specific, but may be particularly suggestive of tuberculous arthritis. As in our case, ESR and CRP were raised, and *M. tuberculosis* culture of synovial tissue and fluid was positive. Positive culture is the gold standard for confirmation of tuberculosis infection, but negative culture is common in an important number of cases. Kerri and Martini previously reported 98 patients with tuberculosis of the knee joint of which 16 cases were confirmed by positive culture and histology, 12 cases by *M. tuberculosis* culture and 60 cases by histology alone [8]. Rasool et al. reported the confirmation of 13 cases of bone tuberculosis only by histopathological examination [9]. Al-Saleh et al. reviewed 27 cases of tuberculous arthritis. The tuberculosis culture of joint fluid was negative in 69.6% of

patients [10]. MRI technique was highly sensitive for visualization of synovitis, but it was not specific and therefore must be interpreted with laboratory results. In this study, MRI showed a marked joint effusion with internal intensities and an edema in the origin of the gastrocnemius muscle, but these findings cannot separate joint tuberculosis from another septic arthritis or inflammatory. The observation of multiple granulomas with necrosis in histopathologic examination of synovial tissue proposed the probability of tuberculosis infection.

Conclusions

Finally, this case shows that clinicians should pay particular attention to the possibility of tuberculosis as the cause of chronic monoarthritis even when pulmonary involvement is not documented.

References:

1. Triplett D, Stewart E, Mathew S et al: Delayed diagnosis of tuberculous arthritis of the knee in an air force service member: Case report and review of the literature. *Mil Med*, 2016; 181(3): e306–9
2. Solanki R, Patel P, Dave P: Extra pulmonary tuberculosis: Rapid identification of *Mycobacterium tuberculosis* and simultaneous detection of rifampicin resistance by GeneXpert assay. *International Journal of Contemporary Microbiology*, 2018; 4(2): 31–37
3. Uboldi FM, Limonta S, Ferrua P et al: Tuberculosis of the knee: A case report and literature review. *Joints*, 2017; 5(3): 180–83
4. Ciobanu LD, Pesut DP: Tuberculous synovitis of the knee in a 65-year-old man. *Vojnosanit Pregl*, 2009; 66(12): 1019–22
5. Lidder S, Lang K, Haroon M et al: Tuberculosis of the knee. *Orthop Rev (Praha)*, 2009; 1(2): e24
6. Basnyat B, Caws M, Wadwani Z: Tuberculosis in South Asia: A tide in the affairs of men. *Multidiscipl Respir Med*, 2018; 13: 10
7. Rajakumar D, Rosenberg AM: *Mycobacterium tuberculosis* monoarthritis in a child. *Pediatr Rheumatol Online J*, 2008; 6: 15
8. Kerri O, Martini M: Tuberculosis of the knee. *Int Orthop*, 1985; 9(3): 153–57
9. Rasool M, Govender S, Naidoo K: Cystic tuberculosis of bone in children. *J Bone Joint Surg Br*, 1994; 76(1): 113–17
10. Al-Saleh S, Al-Arfaj A, Naddaf H et al: Tuberculous arthritis: A review of 27 cases. *Ann Saudi Med*, 1998; 18(4): 368–69