

Knee tuberculosis masquerading as pigmented villonodular synovitis

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Tuberculosis (TB), once a disease confined to undeveloped or developing nations is currently in resurgence, which is attributable to pandemic human immunodeficiency virus (HIV) infection and immigration from endemic areas. Tuberculous arthritis is difficult to diagnose early because of its atypical insidious clinical manifestations and nonspecific imaging findings. TB is also known as the 'great mimicker'. Specifically, monoarticular tuberculosis of the knee may mimic pigmented villonodular synovitis (PVNS). The present report describes a young patient with tuberculous arthritis of knee joint. Accurate diagnosis and appropriate management was delayed due to magnetic resonance imaging (MRI) findings, such as, hemosiderin deposits and a nodular mass around the knee joint, suggestive of a diffuse type of PVNS. Our findings suggest that the first step in the diagnosis of tuberculous knee arthritis is to have a high index of suspicion.

Key words: Delayed diagnosis, extrapulmonary tuberculosis, pigmented villonodular synovitis knee, tuberculosis knee

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INTRODUCTION

Osteoarticular TB comprises approximately 10% of the extrapulmonary tuberculosis (EPTB) cases.^[1] Tubercular arthritis is characteristically monoarticular and most commonly affects the spine and weightbearing joints, such as, the knee and hip.^[2] Accurate diagnosis of tuberculous arthritis, especially in young, immunocompetent patients, is difficult, due to its rare incidence, atypical clinical presentation, and nonspecific radiological findings.^[3] Patients with tuberculous arthritis can be misdiagnosed with pyogenic arthritis, bone tumor or another inflammatory or neoplastic process.^[4,5] Tuberculous arthritis of knee joint may sometimes mimic pigmented villonodular synovitis (PVNS).^[6] Delayed treatment of either condition can result in severe cartilage destruction or high-grade joint deformation.^[7] Furthermore, the mainstay of treatment for tuberculous arthritis and PVNS are totally different, in that tuberculous infections are treated with long-term anti-tubercular chemotherapy, whereas, PVNS requires synovectomy.^[8] Therefore, distinguishing between these two disease entities is critical for patient outcomes. The present report describes a patient with tuberculous knee arthritis, in whom correct diagnosis and treatment was delayed due to a presentation similar to PVNS.

CASE REPORT

A 21-year-old female presented to the Outpatient Department(OPD) of our hospital located in New Delhi,

India, with insidious onset pain and swelling in her right knee joint for the past eight months. There was no specific history of trauma. She was initially treated with non-steroidal anti-inflammatory drugs (NSAID) by her general physician. Subsequently, open subtotal synovectomy was done at a different institution. This provided slight improvement in the symptoms for some time, but they did not subside completely and she was referred to our hospital. Initial examination revealed moderate diffuse swelling and pain around the knee joint with mild increase in local temperature, but with no definite erythema or fever. The joint swelling was disproportionate to the amount of pain. Her range of knee motion was 30-100°, and quadriceps atrophy was prominent. Diagnostic arthrocentesis revealed bloody colored fluid containing 590/mm³ white blood cells, with 70% being polymorphonuclear cells. Blood tests showed a leukocyte count of 7200/cmm and an erythrocyte sedimentation rate (ESR) of 20 mm/hour. Plain anteroposterior and lateral radiographs of the right knee joint revealed no bony or soft tissue abnormality [Figure 1]. Magnetic resonance imaging (MRI) revealed diffuse synovitis with synovial proliferation. A multiple nodular mass was observed in the infrapatellar fat pad and suprapatellar region [Figure 2]. Bony erosion was prominent around the posterior horn of the medial meniscus. T1- and T2-weighted images showed low-signal intensity, indicative of clumps of hemosiderin deposits, diagnostic of PVNS. The combination of hemosiderin deposits and a nodular soft tissue mass

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around knee joint on MRI was highly suggestive of PVNS. Additionally, as there were no clinical or radiological signs of tuberculosis, it was not suspected. Chest radiographs of the patient revealed no active or past signs of tuberculosis. She was, therefore, diagnosed with PVNS of diffuse type. An arthroscopic approach was chosen to do synovectomy, for excision of diffuse PVNS. The intraoperative aspirate revealed a bloody aspirate suggestive of the possibility of PVNS [Figure 3]. Arthroscopic examination showed marked diffuse synovitis between the infrapatellar fat pad and anterior cruciate ligament (ACL). A histological examination of the tissue showed necrotizing granulomatous inflammation, highly suggestive of mycobacterial infection [Figure 4]. No villi form synovial proliferation or pigmented multinucleated giant cells with hemosiderin-laden macrophages were observed. Anti-TB drugs were prescribed and the patient completed 12 months of pharmacotherapy at the following doses: Isoniazid 300 mg OD, Rifampicin 600 mg OD, Pyrazinamide 1500 mg OD, Ethambutol 1000 mg OD, and Pyridoxine 10 mg OD. Synovial culture

was eventually positive for *Mycobacterium tuberculosis*. The patient completed an uneventful 12-month course of anti-tuberculous chemotherapy without radiological evidence of tuberculosis progression, such as, joint space narrowing, juxta-articular osteopenia or erosion. At follow-up 20 months later, she was free of pain and had regained full range of knee motion.

DISCUSSION

The osteoarticular type of TB typically results from a direct hematogenous spread of TB bacilli from the primary focus (e.g., pulmonary (30%), genitourinary (20%) or unidentified (50%)) site. The weightbearing joints are frequently involved due to the effect of trauma.^[1] The rising incidence of TB is explained partly by the increasing incidence of HIV infection. Diagnosis of tuberculous arthritis is often overlooked because of its atypical clinical manifestations and non-specific imaging findings. In this case the surgeon who carried out the index surgery made



Figure 1: Radiograph of the knee showing soft tissue swelling with no osseous lesions



Figure 2: Sagittal magnetic resonance imaging of the left knee. The presence of a multiple nodular mass and low signal intensities indicating hemosiderin deposit were diagnostic of diffuse pigmented villonodular synovitis



Figure 3: Shows the bloody fluid that came out of the right knee joint intraoperatively

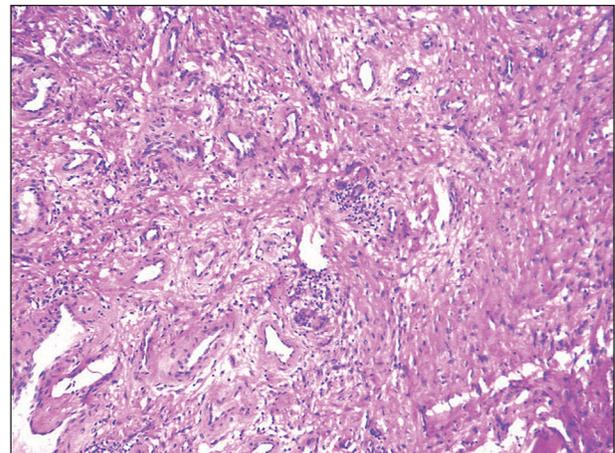


Figure 4: Histopathological picture showing caseous necrosis with giant cell granuloma

a clinicoradiological diagnosis of PVNS, but failed to make a histological diagnosis. The error in diagnosis occurred because of the typical features of PVNS, clinicoradiologically and intraoperatively. Had it been diagnosed and managed correctly initially, there may not have been any recurrence. Even when the patient presented to us, we initially made a clinical diagnosis of PVNS. Fortunately, we took a tissue biopsy at the time of synovectomy, which revealed a tuberculous knee.

Many physicians confronted with patients presenting with chronic unilateral knee arthritis of unknown origin should include tuberculous knee arthritis in the differential diagnosis, so as to avoid misdiagnosing patients with this condition, with having other inflammatory or neoplastic processes with similar clinicoradiological characteristics, such as PVNS. Tuberculous arthritis in a young, immunocompetent patient is especially rare, making such a diagnosis difficult. An improper diagnosis may be due to atypical clinical presentation, wide use of antibiotics, low specificity of diagnostic tools, and most of all, the clinician not suspecting the possibility of tuberculous arthritis, due to its varied clinical presentations mimicking another pathology. An analysis of 10 patients with tuberculous knee arthritis, diagnosed preoperatively by clinical and radiological examination, including MRI and polymerase chain reaction (PCR) assays, found that only 2^[2] (20%) were properly diagnosed at admission, whereas, the other eight (80%) were misdiagnosed preoperatively with rheumatic arthritis, gouty arthritis or osteoarthritis.^[9] Furthermore, the patient described here was initially suspected to have diffuse PVNS, because of her clinical manifestations and MRI features. Both tuberculous arthritis and PVNS in the knee joint of young, otherwise healthy-appearing individuals may present as monoarticular involvement, with painful swelling of long duration (usually more than several months to years) and limited motion. On MRI, both conditions show synovial proliferation, reactive bone marrow edema, and cortical erosion. Moreover, clumps of hemosiderin deposits on T1- and/or T2-weighted MRI are more indicative of PVNS than of tuberculous arthritis.^[10]

Arthroscopy is increasingly used for diagnostic and surgical management of patients with tuberculous arthritis. Even as a definitive diagnosis of tuberculous infection relies on positive culture findings (80% positive rate), cultures require a long incubation period (up to eight weeks). Acid-fast staining of synovial fluid is a more rapid diagnostic method, but is positive in only 20-40% of the infected individuals. Thus, a histological finding of granuloma and caseating necrosis of arthroscopic synovial biopsy is considered diagnostic, with a yield of 90%. Early stage

tuberculous arthritis is usually characterized by synovitis and granulation exudates, which can be treated with synovectomy, under arthroscopic guidance. During late-stage tuberculous arthritis, fibrosis of the joint capsule with intra-articular adhesions results in pain and limited range of motion.^[12] In addition, arthroscopy allows for better detection of concomitant pathology.^[9,12]

In conclusion, because of similar clinical and radiological findings of tuberculous arthritis and PVNS, early differential diagnosis is difficult. In every patient of suspected PVNS, TB must be ruled out.

AUTHORS CONTRIBUTION

SKG contributed in the conception of the work, writing of the manuscript, revising the draft and approval of the final version of the manuscript. SM contributed in the conception of work, follow up of patient, writing of the manuscript, revising the draft and approval for the final version of the manuscript.

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