CASE REPORT

Tri-compartmental tubercular arthritis of knee masquerading as popliteal fossa tumor: a case report

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Introduction

Musculoskeletal tuberculosis is still widely prevalent, especially in the developing countries. Its myriad clinical presentations can present a diagnostic dilemma at times. An appropriate workup and diagnosis is important for a favorable outcome.

Case report

A 50-year old woman of moderate socioeconomic status presented to the outpatient clinic of the Orthopaedics Department at NEIGRIHMS, Shillong, India, complaining of gradual onset of swelling at the back of her right knee and flexion deformity of the same knee for 6 months. She had experienced dull aching pain from 1–2 months after the appearance of the swelling. The pain was gradually increasing and the patient had suffered sleep disturbance due to pain for the last 2 weeks. She gave a history of feeling feverish, especially in the evenings, and of loss of appetite for the last month with no history of weight loss. The patient did not have symptoms pertaining to any other joint. There was no history of swelling, paresthesiae or weakness of the right leg, foot or ankle, and no history of chest pain, cough or hemoptysis, or exposure to tuberculosis. Physical examination revealed a tender globular swelling which was soft to firm in consistency and measured 6 cm × 8 cm in the right popliteal fossa. Wasting of the right thigh and leg was present. The skin over the swelling was normal with no discharging sinus around the knee. There were no dilated veins. The local temperature was not raised. Both medial and lateral joint lines were tender. There was no joint effusion or

synovial thickening. The patella had restricted mobility but was non-tender. The range of motion (flexion) of the knee was from 30° to 130°. There was no popliteal or ipsilateral inguinal lymphadenopathy. The distal pulses were equal bilaterally. There was no knee laxity. Varus/valgus tests, and the drawer and Lachman signs were all negative. On blood examination hemoglobin was 94 g/l, erythrocyte sedimentation rate (ESR) was 68 mm in the first hour and a total leukocyte count of 8.0×10^9 cells/l, with neutrophils 74% and lymphocytes 24%, was found. Serum uric acid was 4.8 mg/dl. Renal and liver function tests were within normal limits. Serum rheumatoid factor was negative. Mantoux (tuberculin) test was reactive with 15 × 12 mm induration after 72h.

X-ray films of the right knee (Fig. 1a–c) showed bony erosion involving the intercondylar notches of the femur and tibia and articular surface of the patella (tri-compartmental involvement) with no metaphyseal erosion, lytic lesion or cyst. There was no periarticular osteoporosis. There was also a break in the continuity of the anterior cortex of the patella. No periosteal reaction or sclerosis was found. There was increased soft tissue shadowing in the posterior aspect of knee joint, with no visible calcification in this soft tissue mass. The joint space could not be commented on due to the fixed flexion deformity and there was apparent valgoid alignment at the knee.

Aspiration cytology reported scant cellularity consisting of occasional synoviocytes and a few scattered pus cells in a thick mucoid background, these findings being suggestive of chronic non-specific synovitis with synovial cyst. Material collected from aspiration was also sent for Gram staining and bacterial culture and sensitivity (c/s), acid-fast bacillus (AFB) smear and mycobacterial culture and sensitivity in Lowenstein-Jensen (L-J) medium. The AFB smear was negative. On Gram staining 4–5 pus cells/high power field were seen and bacterial c/s was negative.

Based on the available findings and investigation results, a differential diagnosis of soft tissue tumor, probably synovial sarcoma, or chronic infective pathology of the right popliteal fossa, was made and a magnetic

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Figure 1 Radiographs showing bony erosion involving the intercondylar notches of the femur and tibia and the articular surface of the patella (tri-compartmental involvement) with no metaphyseal erosion, lytic lesion or cyst. There is no periarticular osteoporosis nor periosteal reaction or sclerosis. A break in the continuity of the anterior cortex of the patella and apparent valgoid alignment can be observed. (a) Anteroposterior, (b) lateral and (c) patellar axial radiographs are shown.

resonance scan was planned. MRI revealed gross bone and soft tissue edema around the knee with joint effusion showing heterogeneous intensity on T2 and hyperintensity on T1 images associated with a collection in the intramuscular compartment of the calf posteriorly. There were subarticular lytic lesions in the femur, tibia and patella, with thick post-contrast enhancement of the synovium, articular cartilage, along the walls of the lytic lesions and within the bone marrow suggestive of infective arthritis (tubercular/pyogenic), the other possible diagnosis being synovial sarcoma.

Synovial biopsy was done and showed caseating granulomatous synovitis, thus establishing a diagnosis of tubercular arthritis of the knee. The patient was commenced on anti-tubercular drug therapy (ATT) with four drugs, the regimen consisting of isoniazid, rifampicin, pyrazinamide and ethambutol. Synovectomy and surgical debridement was planned when the patient had shown no symptomatic improvement 1 month after starting the ATT. During surgery, gross articular destruction involving both sides of the joint was found and it was apparent that the joint could not be salvaged, so a decision to perform knee arthrodesis using Charnley's compression arthrodesis clamps was made. The patient gradually began to respond to treatment, with improvement in all symptoms. She was prescribed ATT for 1 year, at the end of which she was completely pain free, able to carry out the activities of daily living and to return to her previous occupation.

Discussion

The dictum that "tuberculosis can mimic any disease in endemic areas" has gradually evolved with experience to

the extent of becoming an "axiom". We reported this case to highlight this phenomenon.

The knee joint is the third most common site for osteoarticular tuberculosis after the spine and hip joint. Involvement of the skeletal system accounts for less than 3% of all cases of extrapulmonary tuberculosis^{1,2}. Understandably, unusual presentations may lead to a perplexing diagnostic workup. The most distinctive radiographic presentation of tubercular arthritis of the knee joint consists of a well known triad of signs (the Phemister triad), comprising periarticular osteoporosis, peripherally located osseous erosions (both due to chronic synovitis), and gradual diminution of the joint space (the arthritic phase). Isolated involvement of the patella has also been reported in some published articles²⁻⁵. A wedge shaped area of sequestrum formation involving both sides of the involved joint (kissing sequestra) has also been described^{6,7}.

Our patient presented a diagnostic dilemma as she had none of the classical features of tuberculosis of the knee. Though a positive Mantoux test (an area of induration of 15 × 12 mm being considered positive for this test) did theoretically suggest the possibility of tuberculosis, this result cannot in practice be considered significant in endemic areas where most of the individuals are exposed to the infection either from natural sources or due to bacille Calmette-Guérin immunization. The diagnosis was finally established by histopathology of the excised synovial tissue, which is done as a routine in such cases. The histopathology report described the caseating granulomas which are pathognomonic of tuberculosis, thus establishing this as the definitive diagnosis.

Conclusion

Thus, we conclude that tuberculosis of the knee may resemble rheumatoid/rheumatic arthritis, internal derangement of the knee, sub-acute pyogenic arthritis/synovitis, synovial chondromatosis, synovioma (synovial sarcoma), hamartoma, and so on, to name a few, as described by Tuli SM¹. In our case, the clinical features resembled synovial sarcoma. In doubtful cases, biopsy is mandatory in order to establish the diagnosis histopathologically.

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