

Tuberculous Arthritis of Knee Presenting as Baker's Cyst: A Case Report

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Abstract

Background: Baker's cyst is usually degenerative in origin, infective etiology is rare and tubercular origin is exceptional. Tuberculosis (TB) of the musculoskeletal system is an uncommon infection caused by tuberculous bacilli and constitutes 1% - 5% of all forms of TB. About 30% of skeletal TB involves the joints, the knee being the 3rd most commonly affected after the spine and the hip. Knee tuberculosis commonly presents as synovitis or arthritis. We are presenting a case of a young female with clinico-radiological features suggestive of Baker's cyst. Complete excision of Baker's cyst and histopathology was done. Histopathological examination revealed multiple epithelioid granulomas pointing toward a tubercular etiology. Standard ATT protocol with rehabilitation was followed. The patient was asymptomatic at 1st year with complete resolution of symptoms and full range of motion. This case highlights the need to maintain high index of suspicion in cases hailing from endemic region with unusual intra-operative findings; also, the importance of routine histopathological examination.

Keywords: Tuberculosis(TB); Baker's Cyst(BC); Anti-Tuberculous Treatment (ATT)

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Introduction

The Baker's cyst, or popliteal cyst, manifests itself as an increase of volume in the posterior region of the knee. These cysts were described for the first time by Adams in 1840, but were popularized by Baker's description in 1877. In his description, Baker postulated that the formation of this cyst results from a buildup of fluid in the bursa of the semimembranosus tendon, with communication between here and the joint, yet with a one-way flow of fluid in the direction of the cyst, limited by a valve.¹ After Baker's description, several papers described

popliteal cysts and noted that Baker's cyst corresponds to a cyst located between the medial head of the gastrocnemius muscle and semimembranosus tendon.

In this case, a Baker's cyst in the left knee-joint was demonstrated by Duplex scan in a 22 year old female with left knee joint pain and popliteal swelling. Radiological examination showed degenerative changes corresponding to age with popliteal soft tissue swelling and calcified loose bodies posteriorly. Surprisingly MRI of knee demonstrated high suspicion of tubercular lesions

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in both femur and tibia. There was evidence of pulmonary tuberculosis radiologically but patient was asymptomatic. Cyst excision was done and sent for histopathological examination which revealed epitheloid granulomas and Langerhans giant cells. The knee-joint tuberculosis healed completely without residual damage after antitubercular treatment for one year.

Case Report

We report a case of a 22 year old female who presented with a history of swelling in posteromedial aspect of left knee for 10 years and pain for 2 years and difficulty in squatting for 1 month. The patient had no cough or fever and no similar complaints in other joints. There were no constitutional symptoms.

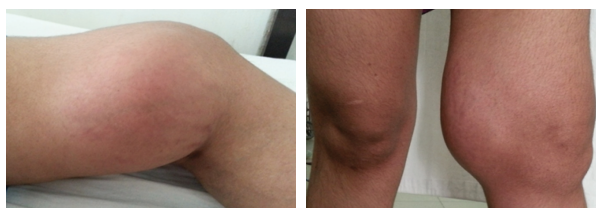


Fig. 1a & 1b: Affected medial and anterior aspect of knee joint

Physical examination showed a diffuse doughy swelling of about 15×15 cm diameter in posteromedial aspect of left popliteal fossa (Fig. 1a & 1b). Auscultation of the popliteal swelling revealed no bruit. Range of motion of the knee was 0° to 45°. There was no significant lymphadenopathy. Peripheral pulses and other joints were normal. Respiratory system examination revealed normal findings. Other findings of systemic examination were unremarkable. On blood examination hemoglobin was 12.2 g/dL, erythrocyte sedimentation rate (ESR) was 60 mm in the 1st hour, total leukocyte count was of 7500/cumm (neutrophils 74%; lymphocytes 20%; monocytes 5%; basophils 0.0%; and eosinophils 1%) and platelet count was 490,000/cumm. Renal and liver function tests were within normal limits. Serum rheumatoid factor was negative.

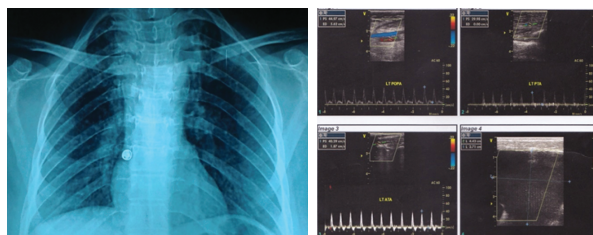


Fig. 2: Chestx-ray

Fig. 3: Duplex study

Chest X-ray showed illdefined opacities in both upper zones (Fig. 2). Duplex study of the swelling of left popliteal region shows large cystic mass measuring about 5.14cm × 3.55cm. In colour flow study, no vascularity is seen in the mass. Arteries proximal and distal to the mass are found normal (Fig. 2b).

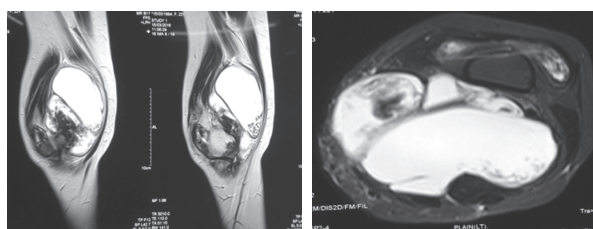


Fig. 4a & 4b: Both sagittal (a) and axial (b) T2 weighted magnetic resonance images depict Baker's cyst.

MRI of the knee added finer details such as synovial thickening, extensive effusion in supra patellar pouch, marrow edema at distal end of femur and proximal tibia, subarticular erosions, narrowing of joint space, intact nature of the cyst (no rupture) and calcified loose bodies in the popliteal cyst (Fig. 4a & 4b). Cyst was aspirated prior to excision which showed thick straw coloured fluid. Aspirate was sent for Gram staining, culture and sensitivity (C/S). On Gram staining 4 - 5 pus cells/high power field were seen and bacterial culture yielded no growth.

Dissection of the popliteal fossa facilitated exposure of a pedunculated cyst on the popliteal surface of femur with a narrow medial stalk. The cyst was related medially to the tendons of semimembranosus and semitendinosus muscles and laterally to the biceps femoris muscle. A subtotal resection of the cyst was performed evacuating 100 ml of thick straw colored fluid and

multiple fragmented pieces of greyish white tissues. The histopathological examination of the cyst revealed epithelioid granulomas compatible with tuberculosis. Anti-tuberculous treatment (ATT) was started postoperatively. After two months of treatment, the patient showed improvement in range of motion and reduction in the right knee swelling. Anti-tuberculous treatment (ATT) was continued for 1 year. At the end of 1 year patient was asymptomatic. Patient remained asymptomatic at the latest follow up i.e., 2 years after primary presentation.

Discussion

Tuberculosis (TB) of the appendicular skeleton is an uncommon infection caused by *Mycobacterium tuberculosis* and constitutes 1% - 3% of all forms of TB.² About 30% of skeletal TB involves the joints, the knee being the 3rd most commonly affected site.³ Musculoskeletal involvement is through haematogenous spread often from a primary focus frequently the lungs as in this case. The incidence of skeletal TB is increasing due to the emergence of multi-drug resistant mycobacterium, increase in the number of immuno-compromised patients and the AIDS pandemic.⁴ Although no age is exempted its incidence in elderly and debilitated patients is high. Classical presentation of knee tuberculosis is chronic pain, diffuse joint swelling, local tenderness, warmth and progressive loss of function. Cold abscesses, sinuses and constitutional symptoms are also common features.^{4,5} Baker's cyst is a rather rare complication of knee joint tuberculosis.^{6,7}

The Baker's cyst is a distension of the gastrocnemius-semimembranosus bursa of the knee, which communicates with the posterior portion of the joint capsule. It usually appears as swelling in the medial aspect of the popliteal fossa secondary to pathological changes in the knee joint causing effusion. Causes are generally noninfectious knee effusion secondary to arthrosis, meniscal tears, trauma, rheumatoid arthritis and gout.⁸ An infected baker's cyst is

much less common and tuberculous arthritis is exceptional, in fact only few cases are described in literature till date.⁷ Ultrasound will readily reveal the presence of fluid in the joint and presence of cystic structure in the popliteal fossa. It also excludes a coexisting DVT due to subjacent mass effect.⁹ Early radiological findings are nonspecific and can't be differentiated from non specific arthritis. The relative preservation of joint space which is a classical feature is due to the lack of proteolytic enzymes in *Mycobacterium tuberculosis*.⁴ Early metaphysical involvement, synovial thickening and articular changes are better demonstrated on MRI which has now become the mainstay of imaging in musculoskeletal tuberculosis.^{5,9} MRI and computerized tomography also help in outlining the baker's cyst and its contents when present; they also help in assessing rupture of the cyst.^{6,9}

However imaging features are at times non-specific, but in the correct clinical context help in diagnosis of tuberculosis. Diagnosis is often based on high suspicion index. To achieve a definitive diagnosis, it is essential to identify *M. tuberculosis*.¹⁰ Bone and joint tuberculosis are however paucibacillary. Many a time Ziehl-Nielsen test is negative and it becomes necessary to wait for the Lowenstein culture results. Synovial biopsy is also an important and diagnostic method to ascertain the causative pathogen.¹¹ Chemotherapy remains the cornerstone of treatment; surgery is indicated in few cases which include joint debridement, synovectomy and cyst excision.^{3,6}

Conclusion

To conclude, our patient presented a diagnostic dilemma as she had none of the classical features of knee tuberculosis but presented with a Baker's cyst (which is commonly caused by inflammatory pathology of noninfective origin). Though a positive Montoux test theoretically suggests 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 and in previously immunized individuals. To further support the diagnosis patient had a chest x-ray suggestive of pulmonary tuberculosis (though patient had no symptoms) and supportive MRI findings of the knee. The diagnosis is finally established with a cyst fluid study and histopathology of the excised cyst, which is done as a routine in such cases.

References

1. Wigley RD. Popliteal Cysts: Variations on a Theme of Baker. *Semin Arthritis Rheum*. 1982;12(1):1-10.
2. Hemant P, Jeshil S, Deepak P, Manoj S, Tufail P, Charles H. Tuberculous Arthritis of the Appendicular Skeleton: MR Imaging Appearances. *European Journal of Radiology*. 2004;52:300-309.
3. Tuli SM. *Tuberculosis of the Skeletal System: Bone, Joints, Spine and Bursal Sheaths*. 3rd ed. New Delhi: Jaypee Brothers Medical Publishers; 2004.
4. Esteban PL, Soriano A, Tomas X, Quintana L, García-Ramiro S. Tuberculous Osteomyelitis of the Knee: A Case Report. *Archives of Orthopaedic Trauma Surgery*. 2004;124:708-10.
5. Spiegel DA, Singh GK, Banskota AK. Tuberculosis of the Musculoskeletal System. *Techniques in Orthopaedics*. 2005;20:167-78.
6. Kulshrestha A, Misra RN, Agarwal P, Gupta D. Magnetic Resonance Appearance of Tuberculosis of the Knee Joint with Ruptured Baker's Cyst. *Australasian Radiology*. 1995;39:80-83.
7. Bianco G, Paris A, Venditti M, Calderini C, Anzivino C, Serra P. Popliteal (Baker's) Cyst in a Patient with Tubercular Arthritis – Report of a Case and Review of the Literature. *Recenti Progressi in Medicina*. 2001;92:663-66.
8. Weinstein SL, Buckwalter JA. *Turek's Orthopaedics: Principles and Their Application*. 5th ed. Philadelphia: JBLippincott; 1994.
9. Radford DM, Schuh ME, Nambisan European Journal CP. Pseudo-Tumor of the Calf. *European Journal of Surgical Oncology*. 1993;19:300-301.
10. De Vuyst D, Vanhoenacker F, Gielen J, Bernaerts A, de Schepper AM. Imaging Features of Musculoskeletal Tuberculosis. *European Journal of Radiology*. 2003;13:1809-19.
11. Hoffman EB, Allin J, Campbell JAB, Leisegang FM. Tuberculosis of the Knee. *Clinical Orthopaedics and Related Research*. 2002; 398:100-106.