



Case report

A case report on non-specific synovitis of the knee due to septic foreign body in the Hoffa fat pad causing diagnostic dilemma

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ABSTRACT

Introduction & importance: Recurrent chronic synovitis due to foreign body is a rare entity and it may progress into chronic septic arthritis. Chronic recurrent synovitis or septic arthritis may leave permanent damage to the articular cartilage and renders the child with permanent disabilities.

Case presentation: A 03-year-old girl has been transferred to a tertiary centre with a history of recurrent pain and swelling of the right knee and on and off limping for six weeks duration. These symptoms were preceded by a history of prick injury to the ipsilateral knee.

Clinical findings & investigations: The knee was warm to the touch, moderately tender and contains effusion. C-Reactive peptide level series were elevated, Erythrocyte sedimentation rate was 83 mm/1st hour and White cell count was 10,300/mm³. The ultrasonography revealed suprapatellar bursitis, other investigations such as Antinuclear antibody levels, Rheumatoid factor and Bacterial culture of the aspirate were negative.

Interventions & outcome: Arthrotomy and synovectomy performed. While performing synovectomy, an organic thorn has been retrieved from the Hoffa fat pad. The child was treated with intravenous antibiotics for ten days (Co-amoxiclav) and discharged. Her recovery was uneventful and in six weeks she has shown marked improvement of the knee function. Histological examination revealed non-specific chronic synovitis.

Relevance & impact: Chronic synovitis due to foreign body mimicking septic arthritis or causing diagnostic difficulty is a rare entity in the paediatric population. Careful clinical evaluation after creating a good rapport with the child is of utmost importance.

1. Introduction

Foreign body in the knee following occupational injuries [1], war injuries [2,3], prick injuries [4,5] and intra articular injection [6] have been described in the literature. These reported foreign bodies have embedded in the soft tissues of the knee or the bone. According to its location, level of contamination, the treatment that has been provided, the presenting complaints may vary. The reaction of the body in the presence of the foreign materials may wall off it and causing a subacute or a chronic presentation. Here we present a girl who had an unknown prick injury to her right knee, six weeks back and presented with the features of persistent synovitis, found to have an organic foreign body inside the knee.

This case report has been prepared according to the SCARE guideline

2020 [7].

2. Case report

A three-year-old girl has been transferred from a local base hospital to a tertiary care hospital for the further evaluation and management of recurrent pain and swelling of the right knee for six weeks duration. The child was previously healthy. There was no history of fever, surgery, trauma, any recent history of invasive procedures, hospital admissions or intravenous drug administrations. On further careful questioning, the child disclosed a prick injury to the right knee by a thorn of an unknown tree six weeks back while playing. The child had been taken to a nearby hospital, where she was treated with oral medications. Parents thought the thorn has been removed completely at that time. The child has a

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complaint about recurring knee pain in two weeks, for which she has been treated with oral medications by a general practitioner. When they have been returned to the same base hospital for recurring symptoms six weeks after the incident, the child has been transferred to the tertiary facility for orthopaedic care.

The child was walking with an antalgic gait, the afebrile, right knee was swollen and with suprapatellar fullness, there was a tiny uncomplicated scar found just lateral to the patella tendon. There was no redness. The range of movements was 20° to 100°. The joint was moderately tender, warmer compare to the contralateral side with the positive patella tap. Synovial thickness was felt on the suprapatellar region.

Her complete blood count showed 10,380/mm³ white cell count with 46% of neutrophils, Erythrocyte sedimentation rate(ESR) was 83 mm in 1st hour and the C-reactive peptide(CRP) was 45 mg/L. Ultra-sound scan evaluation of the knee revealed thick effusion inside the knee with marked synovial thickening favouring suprapatellar bursitis. The radiograph of the knee did not reveal any abnormalities (Fig. 1). The microscopic evaluation of the knee aspiration shown blood-stained effusion which contained 20 polymorphonuclear cells/mm³, 8640 Lymphocytes/mm³ and 6656 red cells/mm³. The bacterial culture of the effusion failed to grow any organism. The rheumatological opinion also had been obtained to exclude rheumatological conditions. Antinuclear antibody levels (ANA) and Rheumatoid factor level blood picture, and

coagulation profile were also normal. The repeated CRP in two days was 75 mg/L, persistent pain and morbidity pointed towards surgery.

Arthrotomy and synovectomy under general anaesthesia were planned. The surgery was performed by the Senior Registrar in Orthopaedic surgery with more than 07 years of experience. The child was placed supine with the pneumatic tourniquet on the ipsilateral thigh. Through the lateral approach, the knee was opened. Synovial proliferation has been observed. Completed excision of the synovium had been performed. While performing synovectomy there was a dark coloured thorn had delivered from the lateral part of the "Hoffa Fat pad" (Fig. 2). The joint cavity (Fig. 3) was washed with 0.9% Normal saline solution (approximately 01 L) and closed in layers. A compression bandage has been applied and the child had been started on intravenous Co-amoxiclav 375 mg eight hourly. Gentle knee bending exercises has been encouraged since the first post-operative day itself. The histopathology examination revealed synovial lining with evidence of moderate chronic non-specific synovitis without any evidence of granuloma or neoplastic lesions (Fig. 4).

The recovery was uneventful. The third postoperative day wound inspected. The Intravenous antibiotic had been continued for ten days postoperatively. The CRP levels were monitored and shown a downward trend. The Child was discharged 10 days after surgery with oral Co-amoxiclav. The CRP level on discharge was 9 mg/L. The child was reviewed every two weeks with repeated CRP levels. Her range of motion was improved from 0° to 150°. The oral antibiotic had been continued for 32 days. Now, the child is followed up at the clinic every three months and parents have been taught about the features of septic arthritis.

3. Discussion

Differential diagnoses for pain and swelling of a knee joint in a child are many. Those are transient synovitis, reactive synovitis, septic arthritis, monoarticular rheumatoid arthritis, haemophilia, leukaemia and pigmented villonodular synovitis. Chronic non-specific synovitis due to thorn prick injury is a rare entity. Anyway, excluding septic arthritis due to the foreign body should be done in the first instance according to the saying in orthopaedic surgery that "A child with joint pain and swelling, is septic arthritis until proven otherwise". Children may not disclose the initial injury during their playtime. To diagnose this entity, careful clinical evaluation including history taking and examination should be carried out after creating a good rapport with the child. This may reduce the delay in diagnosis and its consequences.

The body reaction to the foreign body may vary according to the type



Fig. 1. Shows radiographs of lateral (a) and anteroposterior (b) views of the right knee, which revealed no abnormalities.



Fig. 2. Shows excised synovium denoted by tan and yellow tissue piece (left-hand side) and the retrieved thorn on the right side denoted by dark coloured sharp foreign body (Red coloured arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)



Fig. 3. Shows the exposed knee joint cavity following synovectomy.

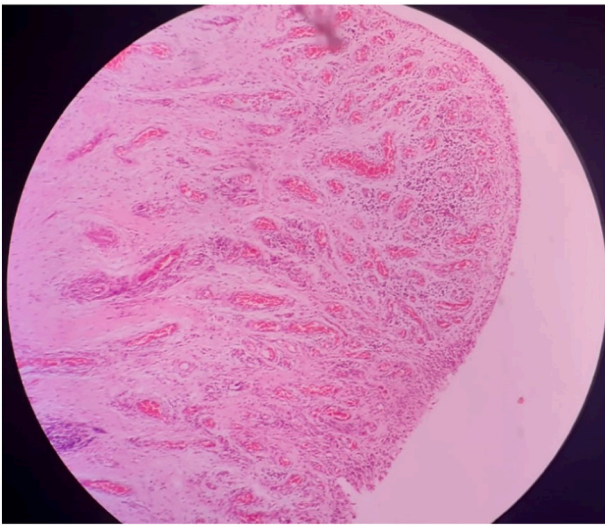


Fig. 4. Microscopic section shows synovial lining with dilated blood vessels and lymphocyte infiltration suggestive of moderate chronic non-specific synovitis without any evidence of granuloma or neoplastic lesion.

of foreign body (Organic vs Inorganic), site of the foreign body, level of contamination, containing micro-organisms and the treatment provided before the indexed presentation. Previously organic foreign bodies were considered sterile. This concept has been questioned later following the synovial fluid cultured *Staphylococcus albus*, *Streptococcus haemolyticus*, Gram-negative rods, anaerobic organisms and fungus in the presence of organic foreign bodies [5]. In addition to this, organic foreign materials are highly inflammatory as they contain oils, resins and alkaloids. These materials are toxic to the tissues subsequently they create a marked tissue reaction [5].

Haematological investigations will help to exclude other conditions. Radiographs may help in the presence of a radio-opaque foreign body and may show secondary changes in the bone and the articular surfaces. Ultrasonography is more sensitive to radio-opaque and non-radio opaque foreign materials. It may help in diagnosing soft tissue reaction to the foreign bodies as well [8]. But, in our case, the ultrasound failed to locate the foreign body. The computed tomography (CT) is helpful in the presence of radio-opaque foreign bodies but it will not help in non-radio

opaque materials, will not find any soft tissue changes [8] and carries a high radiation dose. Magnetic resonance imaging (MRI) may help to find the non-metal foreign material but, it is contraindicated if suspecting a metallic foreign body [8]. Joint fluid aspiration analysis will help to exclude septic arthritis and the culture will help to find the causative organism.

Arthroscopy is an alternative to arthrotomy. It has several advantages such as minimal invasiveness, able to visualize the rest of the structures and the cartilaginous surfaces and reduce postoperative morbidity. But there are chances of missing foreign bodies [5] which are embedded in the soft tissue or the bone. The open approach does not need an expert and it gives wide exposure and allow to feel and remove the foreign body. It carries increased post-operative pain, risk of bleeding, risk of wound complications and larger scar.

In this child the initial management failed to address complete removal of the foreign body at the local health facility and later during the visit to the general practitioner the problem has not been identified properly would have resulted in recurrence of symptoms and delayed diagnosis.

4. Conclusion

Septic foreign body in the Hoffa fat pad causing non-specific synovitis of the knee is a rare entity. Any patients presented with a similar history and clinical presentation must be treated as septic arthritis. Blood investigations, synovial fluid and tissue cultures are of utmost importance. However, the sterility of cultures does not exclude the diagnosis. Suspecting the possibility, early identification of the condition by a clinical evaluation, arranging radiological investigations, early surgical treatment, antibiotics and good rehabilitation are keys to avoid devastating complications. Arthroscopy and arthrotomy have their advantages and disadvantages. Those have to be balanced according to the necessity and the availability of facilities.

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Ethical approval

Ethical approval has not been obtained for this study.

Consent

Informed written consent has been obtained after a thorough explanation to her parents for the case report and accompanying images. A copy of written consent is available for review on the request by the Editor-In-Chief of this journal.

Registration of research study

Not applicable.

Guarantor

Dr. Vimalarajan Rajeswaran, Board-certified Consultant Orthopaedic surgeon, Department of Trauma & Orthopaedics, Teaching Hospital-Batticaloa, Sri Lanka.

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CRediT authorship contribution statement

Kalaventhnan Pathinathan, Dishanth Sivakumaran, Mohamed Rifky,

Vimalarajan Rajeswaran, Niroshan Jayarathne, and Chevindra Bopitiya have contributed to the patient's assessment, arranging investigations, treatment, concept, data collection and writing of this case.

Declaration of competing interest

All authors of this case report disclose any financial or personal involvement of third parties or any organizations that could inappropriately influence their work.

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