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Case report: Thorn prick injury to left knee

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Abstract

We report the case of a 12 year old healthy boy, who was admitted 50 days after being injured by a plant thorn, with limping caused by pain and swelling in his left knee. An ultrasound examination revealed a complex collection with multiple septations in pre patellar and suprapatellar region extending into joint space with inflammatory changes in adjacent fat of the left knee. The patient underwent Arthroscopic synovectomy and foreign body removal with tissue biopsy and joint lavage. The postoperative course was uneventful, and joint function returned to normal.

A review of the literature between 1953 and 2002 revealed that bacterial growth after plant thorn injuries is reported infrequently. Therefore, it must be considered and suspected in “aseptic” cases of arthritis, when there is a history of a plant thorn injury.

Keywords: Thorn prick, plant thorn, arthritis

Introduction

A 12 yrs. old boy came to OPD with 10 days history of painful and swollen knee. He came to Mamata academy of medical sciences with h/o thorn prick to left knee while playing. He removed the thorn by himself. Pain developed in left knee which was gradual in onset and progressive in nature, dull aching, non-radiating, increased on walking and decreased on rest. No medication as such has been taken. After 10 days swelling developed in left knee which was gradual and progressive in nature. He came to Mamata academy of medical sciences for management where USG left knee and aspiration was done and sent for culture, cytology and synovial fluid analysis. Ultrasonography showed Complex collection with multiple septations measuring about 55*30 mm seen in the supra patellar region. On Color Doppler, no evidence of increased vascularity noted. Likely hemorrhagic collection. An arthrocentesis yielded 80 ml of purulent fluid. Direct microscopic examination of the fluid revealed many leucocytes, but no bacteria. Culture report showed no growth. Analysis shows elevated Adenine deaminase and elevated neutrophils. Operative management was explained and admission was advised. Since patient was not affordable he refused for admission.

He went to another hospital for further management where evaluation was done by another aspirate and culture which showed negative growth. Montoux test was done which was negative. Patient was continued on medical management for about 40 days on OPD basis. Since there was no improvement in symptoms he came back to Mamata academy of medical sciences for further management and got admitted.

Physical examination on admission showed an afebrile patient in good condition. His left knee was warm, swollen, and tender. Swelling present in left knee joint with full supra and para patellar pouches with positive patellar tap. Considerable limitation of active and passive range of motion of 15* to 60* was noted. Blood leucocyte count was 10.6×10^6 cells/l. Erythrocyte sedimentation rate was 130 mm/h. C-Reactive protein was <6mg/L. Radiographs of the knee showed only soft tissue swelling, and no foreign body was detected. Review scan was done on second visit which showed E/O 61*28*59mm (approx. 53cc) organized heterogeneously hyperechoic collection in subcutaneous plane in pre patellar and suprapatellar region extending into joint space with inflammatory changes in adjacent fat. Likely infective/ hemorrhagic (in view of trauma).



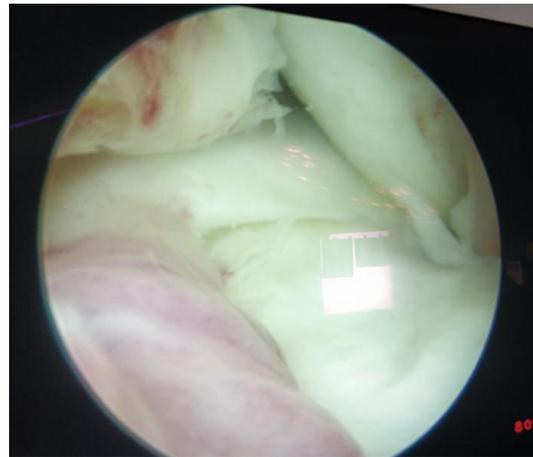
Pre op clinical picture- knee extension



Foreign body



Pre op clinical picture- knee flexion



Anterior horn of medial meniscus (white-white zone) inflammation

Intra Op under Anaesthesia Clinical Pictures

The patient underwent arthroscopic synovectomy with tissue biopsy and joint lavage. Joint aspirant showed consolidated pus with blood. Synovial tissue taken for biopsy. Joint explored for foreign body and debridement was done. No foreign body was seen in the knee joint. Fat pad and inflamed tissue shaved. Anterior horn of medial meniscus (white-white zone) was inflamed. Thorn prick site explored for foreign body and removed. Joint lavage given. Intravenous antibiotic therapy was continued; the patient remained afebrile, and the swelling decreased. Postoperative ultrasound examination revealed no trace of foreign body remnants. Synovial fluid for cytology showed smears which are richly cellular and showed plenty of neutrophils along with occasional lymphocytes and macrophages in a proteinaceous background which suggest inflammatory fluid. Synovial tissue and fluid for culture showed no bacterial growth. His CBNAAT was negative. ESR and CRP were normal. Histopathology showed polypoidal synovium, focally lined by flattened epithelium, sub epithelial fibro collagenous tissue studied by nuclear debris and plenty of neutrophils. Also shows reactive lymphocytes and plasmacytoid cells which suggest suppurative inflammation. The patient remained hospitalized for one further week. The postoperative course, including a four week follow up examination, was uneventful, and joint functioning returned to normal.



Aspirant from knee joint

Discussion

Thorn injury to joints is uncommon, but should be thought of in cases of acute monoarticular arthritis. In this case, the most salient feature of the history was that of a penetrating injury to the knee with plant material, which was readily volunteered by the patient, but is often overlooked. Additionally, the patient had removed the twig at the time of his injury, however removal had been incomplete, leaving a small piece of plant material behind. Also of worthy consideration was the rapid onset of symptoms from the time of injury. In a case of this type, where a history of penetrating injury is present, then arthroscopic washout or formal arthrotomy is mandatory since there are numerous examples in the literature of cases of recurrent episodes of isolated joint sepsis/synovitis.

Foreign body synovitis may simulate an acute septic arthritis^[1]. A history of penetrating injury to a joint may not be readily forthcoming, or may be overlooked in the history taking with consequences for long-term sequelae.

Historically, failure to discover an organism in the joint fluid after a plant thorn injury led to the hypothesis, first published in 1953,^[2] that the arthritis or synovitis after these injuries was the result of an allergic reaction, mostly caused by plant toxins, and hence was aseptically^[3, 4].

In cases of missed diagnosis, the typical presentation may often be of a transient synovitis followed by a relatively asymptomatic period and later by a chronic arthritis long after the thorn injury has been forgotten. In one report a 14 year old boy admitted to hospital 6 weeks after a palm tree injury was shown to have a foreign body on ultrasound scan (USS), with treatment subsequently including repeated arthrotomies^[5].

Thorn prick injury around the joint should be treated by thorough joint lavage and exploration of joint for foreign body, which may be via arthroscopy or arthrotomy. Arthroscopy in theory affords the best view with lower morbidity compared with arthrotomy^[6, 7]. Although much of

the published work comparing arthrotomy with arthroscopy in children is condition specific (for example septic arthritis, osteochondritis dissecans, and diagnostic) [8], there is strong evidence in the current literature favoring arthroscopy over arthrotomy.

Potential disadvantages of arthroscopy of the knee include the increased technical demands and the small risk of damage to the articular surface. Additionally, the operating time of the procedure will be increased with arthroscopy [8]. However, numerous published studies have shown clearly that there is decreased morbidity with improved outcomes, as well as better visualization of the joint using arthroscopy over arthrotomy in cases of both plant thorn injuries and true septic arthritis. Effective early treatment can also be achieved with the arthroscopic route [6].

Imaging modalities such as USG, computed tomography, and magnetic resonance imaging (MRI), help in cases where intra-articular foreign bodies have not been identified. Examples of this type of case may be where there has been a delay in diagnosis or the foreign body is extra-articular [9]. Furthermore, cases have been reported where a plant thorn synovitis was diagnosed after MRI was initially used to exclude other differential diagnoses for example septic arthritis of an elbow joint [10]

Conclusion

When a patient presents with acute onset mono articular pain and swelling in the knee, possibility of thorn prick to the joint should always be considered apart from septic arthritis through clinical history. Since the initial joint aspirant showed no bacterial growth, plant thorn prick injury should strongly be considered. The detailed history about the symptoms and nature of the injury should be taken and thorough evaluation should be done. A normal CRP result, as in this case, adds further weight to this differential diagnosis, as it would be considerably elevated in true infection. In either of the conditions, arthroscopy or arthrotomy should be done to wash the joint and remove foreign body. In this particular case, foreign body was not found in the joint but in the soft tissue material adjacent to the joint (supero-medial side), so foreign body was not removed by arthroscopy but with a small incision at the thorn prick site. Because arthroscopy was opted in the above patient, the procedure was minimally invasive and early rehabilitation was possible even though it was not as cost effective as arthrotomy.

In view of above case we can conclude that thorough history, examination and evaluation of the patient plays crucial role on making an accurate diagnosis, and arthroscopy should be opted over arthrotomy whenever possible.

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