

A Case Report of Synovial Chondromatosis of the Knee Joint arising from the Marginal Synovium

Sunil Kukreja¹

What to Learn from this Article?

Clinical presentation of synovial chondromatosis in adolescent age group?

Management of synovial chondromatosis?

Abstract

Introduction: Synovial chondromatosis is a rare benign condition arising from the synovial membrane of the joints, synovial sheaths or bursae around the joints. Primary synovial chondromatosis typically affects the large joints in the third to fifth decade of life, although involvement of smaller joints and presentation in younger age group is also documented. The purpose of this case report is to document this rare synovial pathology especially in an adolescent age group, which required open synovectomy and debridement to eradicate it. Metaplastic growth from the marginal synovium fixed to the adjacent cartilage was atypical feature in this case, which to the best of my knowledge has not been reported earlier.

Case Report: A sixteen year old boy presented with one year history of pain, swelling and restriction of left knee joint. After the clinical and radiological assessment open synovectomy, removal of loose bodies and thorough joint debridement procedure was performed. Histopathological study confirmed the findings of synovial chondromatosis.

Conclusion: Synovial chondromatosis is a rare benign condition very rarely seen in adolescent age group. Metaplastic growth arising from marginal synovium was an atypical feature which is occasionally seen. Complete synovectomy offers reliable cure rate.

Keywords: synovial chondromatosis, marginal synovium, loose body, Knee joint.

Introduction

Synovial chondromatosis is a rare benign condition involving the synovial lining of joints, synovial sheaths and bursae. It is the metaplastic process of synovium, which converts it into the cartilage and gets detached to become a loose body [1,2]. It mainly affects large joints; knee, hip, shoulder, ankle and wrist [3]. Involvement of smaller joints has also been reported, which includes distal radioulnar, tibio-fibular, metacarpophalangeal and metatarsophalangeal joint [4,5,6,7]. Bursae around the joints are also important rare locations for synovial chondromatosis [8,9,10]. It typically presents in third to fifth decade of life. It is rare

during childhood with only few reports in literature [11,12]. Patients usually present with pain, swelling and restriction of movements [9]. Management is mainly surgical either open or arthroscopic [3,13]. My aim is to present a case of synovial chondromatosis in an adolescent, which is a rare age group for this synovial pathology and also to report another atypical feature of its origin from marginal synovium, which to the best of my knowledge has not been documented in earlier reports.

Case Report

A sixteen year old boy presented with one year history of pain, swelling and restriction of left knee joint. Patient's symptoms were insidious in onset, which gradually progressed in its severity. There was no history of antecedent trauma, loss of appetite and fever. Patient does not give history of any definitive treatment taken for his present complains. On examination, the left knee was kept

¹Assistant professor, department of orthopaedics, Gajara Raja medical college, Gwalior

Author's Photo Gallery



Dr. Sunil Kukreja

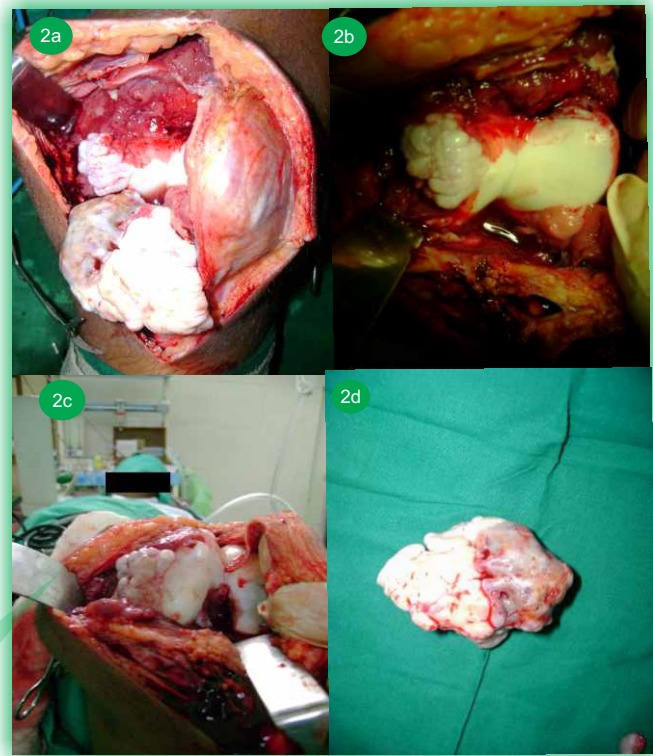
Address of Correspondence

Sunil Kukreja, Assistant professor, Department of orthopaedics, Gajara Raja medical college, JAH hospital, Gwalior (M.P.), Pin- 474009.
E-mail- drsunilkukreja@yahoo.co.in



Fig1a- Plain X-ray of left knee joint showing the radiopaque body in front of femoral condyles with irregularity of posterior margin of medial condyle.
Fig1b- MRI T-2 image showing the effusion, synovial hypertrophy and a loose calcific body in front of the femoral condyle pushing over the patellar tendon anteriorly.

Fig2a- Left knee joint exposed by medial parapatellar approach, a large loose body lying in front of lateral condyle and intercondylar notch.
Fig2b- Irregular nodular mass seen over the anterior and marginal portion of the medial condyle.
Fig2c- Another irregular mass attached to synovial-cartilage junction of medial condyle and the adjacent cartilage.
Fig2d- A large loose body of around 7x4cm extracted from the knee joint.



in 15-20° flexion with obvious quadriceps wasting. There was generalized swelling of the knee with fullness in the popliteal fossa. On palpation effusion was present with normal local temperature. There was a diffuse tenderness all around the knee, medial joint line being the most tender site. There was a bony hard slightly movable swelling palpated just lateral to the patella, which was extending to the midline beneath the patellar tendon. Irregular hard swellings could be felt along the margins of medial femoral condyle. Patient had fixed flexion deformity of 15° with further flexion was up to 110°. Instability tests were negative and there was no abnormality upon examination of distal neurovascular status. Plain X-ray of the left knee joint shows a large radiopaque body in front of the femoral condyle with irregularity of the posterior articular margin of the medial condyle (Fig. 1a). MRI was showing the effusion, synovial

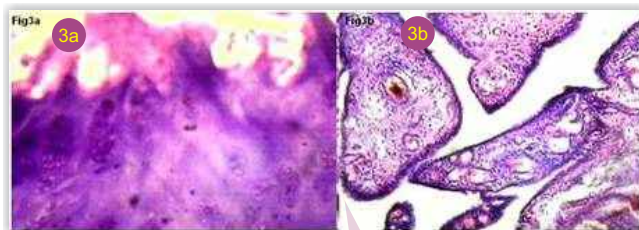


Fig3a- Histopathology slide of the loose body showing lobules of cartilage without cellular atypia.
Fig3b- Histopathology of synovium showing the papillary hypertrophy of synovium with increased vascularity.

hypertrophy and a loose calcific body in front of the femoral condyle pushing over the patellar tendon anteriorly (Fig. 1b).

Surgical management was planned and open procedure was preferred considering the extensive involvement with a large loose body inside the knee joint. Anterior mid-line incision was given and knee joint was exposed by medial parapatellar approach. A large loose body of around 7x4 cm was removed which was lying beneath the patellar tendon and lateral ratinaculum (Fig. 2a,2d). Irregular nodular outgrowths were present along the margins of medial femoral condyle from anterior to posterior, which were thoroughly removed (Fig.2b,2c). Extensive synovectomy was done in all the compartments. Synovium and the bodies were sent for histo-pathological examination, which confirmed the diagnosis of synovial chondromatosis with papillary hyperplasia of the synovium (Fig.3a,3b). Post-operatively patient was instructed about knee mobilization and strengthening exercises and followed up at one, three and six months. Patient's range of movement was 0-130° of flexion without pain at three months post-operative period. There was no recurrence at one year after the surgery.

Discussion

Synovial chondromatosis is a rare metaplastic condition which is characterized by formation of cartilaginous

bodies within the synovium and subsynovial connective tissues of the large joints. There are three phases in the disease process of synovial chondromatosis. Phase 1- Metaplasia of synovium with active synovitis and absence of loose bodies. Phase 2- Active synovitis with the formation of loose bodies, which are still cartilaginous. Phase 3- Loose bodies tends to calcify and synovitis subsides [2]. Patient typically presents with swelling, pain and restriction of movements and normally presents in their third to fifth decade [9], though there are reports of its occurrence in childhood [11,12]. Synovial chondromatosis is twice more common in males [14]. Presentation is mostly unilateral, but bilateral involvement has also been seen [7,10,15]. Plain radiograph, ultrasound, CT and MRI are the imaging modalities which can be used to assist in diagnosing this condition. MRI is definitely the modality of choice because of its superior soft tissue contrast [16].

Since knee joint is anatomically complex, location and extension of the lesions also vary. Involvement of knee can be intraarticular, extraarticular or combination of both [9,18]. Extent of the disease can vary from affecting merely cruciate ligaments to the extensive involvement of the knee joint [18,19,20]. Nodules of the metaplastic growth are usually embedded within the synovium or loosely attached to it [7,9,11,13,15,16,17,18]. Contrary to it, patient described in my report has several nodular growths arising from the synovium of the medial joint margin, which are fixed to the joint line and adjacent articular cartilage. Possibly this can be explained by immunohistochemical study conducted by Allard et al, which states that in all joints at the junction with synovium, a vascular, wedge-shaped tongue of tissue was found to cover the cartilage surface. This marginal tissue overlying cartilage was in continuity with and was immunohistochemically similar to the adjacent synovial tissue [21].

Management is mainly surgical. Open and arthroscopic procedures can be used to treat this condition [3,13]. Synovectomy gives better results as compared to loose body removal alone [13]. Total knee arthroplasty is also an option if synovial chondromatosis is coexistent with osteoarthritis [9,22]. I preferred to do an open procedure in my patient because of radiologically visible large loose body. This also helped me to thoroughly debride the growths along the medial condyle, which was not possible if arthroscopic method was used (although an expert in arthroscopy may argue otherwise).

Complications of synovial chondromatosis can be

secondary osteoarthritis, malignant transformation and recurrence [13,22,23]. Pigmented villonodular synovitis, synovial hemangioma, and lipoma arborescens are few conditions which can mimic synovial chondromatosis [24]. Radiography and histology may help in accurately differentiate amongst them.

Conclusion

A rare case of synovial chondromatosis is described here with successful treatment by open synovectomy. Peculiarities in this case is its presentation age and metaplastic synovium at the margins of the joint.

Clinical Message

Synovial chondromatosis is an uncommon presentation in adolescent age group. This condition normally presents with multiple loose bodies within the joint or over the synovial bed. Synovial chondromatosis presenting as fixed nodular outgrowths from the marginal synovial tissue is an atypical feature. Open synovectomy and thorough debridement should be preferred especially in patient with such an extent of the disease, where arthroscopy does not seem to be a practical option. Aim should be to minimize chances of recurrence.

References

1. Jeffreys TE: Synovial chondromatosis. *J Bone Joint Surg* 1967, 3:530-534
2. Miligram JW: Synovial osteochondromatosis. *J Bone Joint Surg* 1977; 59-A:792.
3. Yu GV, Zema RL, Johnson RWS: Synovial Osteochondromatosis. A case report and review of the literature. *J Am Podiatr Med Assoc Journal* 2002; 92:247-54.
4. Von Schroeder HP, Axelrod TS. Synovial osteochondromatosis of the distal radio-ulnar joint. *J Hand Surg(Br)*. 1996 Feb; 21(1):30-2.
5. Batheja NO, Wang BY, Springfield D, Hermann G, Lee G, Burstein DE, Klein MJ. Fine-needle aspiration diagnosis of synovial chondromatosis of the tibiofibular joint. *Ann Diagn Pathol* 2000 Apr; 4(2):77-80.
6. Bryan AW, Dean-Yar T, Christina MW. Metacarpophalangeal joint synovial osteochondromatosis: A case report. *Iowa Orthop J* 2008; 28: 91-93.
7. Tagliavero G, Moro S, Stecco C, Pennelli N. Bilateral synovial chondromatosis of the first metatarsophalangeal joint: A case report. *Reumatismo* 2003 Oct-Dec; 55(4):263-6.
8. Boya H, Pinar H, Ozcan O. Synovial osteochondromatosis of the suprapatellar bursa with an imperforate suprapatellar plica. *Arthroscopy* 2002 Apr; 18(4):E17.

9. Paraschau S, Anastasopoulos H, Flegas P, Karanikolas A. Synovial chondromatosis: A case report of 9 patients. *E E X O T* 2008; 59(3):165-9.
10. Kawasaki T, Imanaka T, Matsusue Y. Synovial osteochondromatosis in bilateral subacromial bursae. *Rheumatol* 2003; 13:367-70
11. Carey RP. Synovial chondromatosis of the knee in childhood. A report of two cases. *J Bone Joint Surg Br* 1983 Aug; 65(4):444-7.
12. Kistler W. Synovial chondromatosis of the knee joint: a rarity during childhood. *Eur J Pediatr Surg* 1991 Aug; 1(4):237-9.
13. Ogilvie-Harris DJ, Saleh K. Generalized synovial chondromatosis of the knee: A comparison of removal of the loose bodies alone with arthroscopic synovectomy. *Arthroscopy* 1994 Apr; 10(2):166-70.
14. Valmassy R, Ferguson H. Synovial Osteochondromatosis: A brief review. *J Am Podiatr Med Assoc* 1992; 82:427-31.
15. Heather S, Paula S, Andrew B, Tania P. A case report of bilateral synovial chondromatosis of the ankle. *Chiropractic & Osteopathy* 2007, 15:18
16. Frick MA, Wenger DE, Adkins M. MR imaging of synovial disorders of the knee: an update. *Radiol Clin North Am* 2007 Nov; 45(6):1017-31.
17. Amin MU, Qureshi PS, Ghaffar A, Shafique M. Primary synovial osteochondromatosis of the surapatellar pouch of knee: Correlation of imaging features with surgical findings. *Journal of Radiology Case Reports* 2010 Aug; 4(8):7-14
18. Mackenzie H, Gulati V, Tross S. A rare case of a swollen knee due to disseminated synovial chondromatosis: a case report. *Journal of Medical Case Reports* 2010; 4:113.
19. Majima T, Kamishima T, Susuda K. Synovial chondromatosis originating from the synovium of the anterior cruciate ligament: a case report. *Sports Med Arthrosc Rehabil Ther Technol* 2009; 1:6.
20. Pengatteeeri YH, Park SE, Lee HK, Lee YS, Gopinathan P, Han CW. Synovial chondromatosis of the posterior cruciate ligament managed by a posterior-posterior triangulation technique. *Knee Surg Sports Traumatol Arthrosc* 2007 Sep; 15(9):1121-4.
21. Allard SA, Bayliss MT, Maini RN. The synovium-cartilage junction of the normal human knee. Implications for joint destruction and repair. *Arthritis Rheum.* 1990 Aug; 33(8):1170-9.
22. Ackerman D, Lett P, Galat DD Jr, Parvizi J, Stuart MJ: Results of total hip and total knee arthroplasties in patients with synovial chondromatosis. *J Arthroplasty* 2008; 23(3):395-400.
23. Peter H, Neil A, Justin C, Ali F, William H. Malignant transformation in synovial chondromatosis of the knee? *The Knee* 2001 oct; 8(3),239-42.
24. Adelani MA, Wupperman RM, Holt GE. Benign synovial disorders. *J Am Acad Orthop Surg.* 2008 May; 16(5):268-75.

Conflict of Interest: Nil
Source of Support: None

How to Cite this Article:

Kukreja S. A Case Report of Synovial Chondromatosis of the Knee Joint arising from the Marginal Synovium. *Journal of Orthopaedic Case Reports* 2013 Jan-March; 3(1):7-10