Lipoma arborescens: is it the cause or effect?

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Lipoma arborescens is benign villous lipomatous proliferation of the synovium. The fronds-like masses are non-neoplastic fatty deposits on the synovium. The word *arborescens* is a Latin term meaning 'tree-forming' or 'tree-like'. This article presents two cases of young adults who presented with pain and swelling around knee joint and were diagnosed on the basis of characteristic MRI findings, and hence signifies the role of MRI in diagnosing the cause of inflammatory synovitis in young patients. In addition, MRI helped in deciding the management of these patients. There was significant symptomatic improvement seen on follow-up, which further helps to strengthen the hypothesis that underlying lipoma arborescens could be a rare underlying cause for undiagnosed inflammatory synovitis in young adults.

Keywords:
inflammatory synovitis, knee effusion, lipoma arborescens, MR

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Introduction

Lipoma arborescens (LA) is a rare, idiopathic synovial disorder characterized by frond-like, non-neoplastic, fatty deposition on the synovium. In most cases, it is idiopathic in nature or seen in association with degenerative joint disease or rheumatoid arthritis [1–3]. Recently, it has been suggested that LA could be associated with undiagnosed inflammatory synovitis, especially in young adults [4–6]. This report of these two cases stresses the possibility of an association between LA and inflammatory synovitis and highlights the role of MRI in helping to reach the diagnosis and decide proper management. The importance of correct diagnosis is that these patients undergo arthroscopic synovectomy or radiosynovectomy using 185 MBq yttrium-90 colloid rather than receiving oral medication.

Case report

Case 1

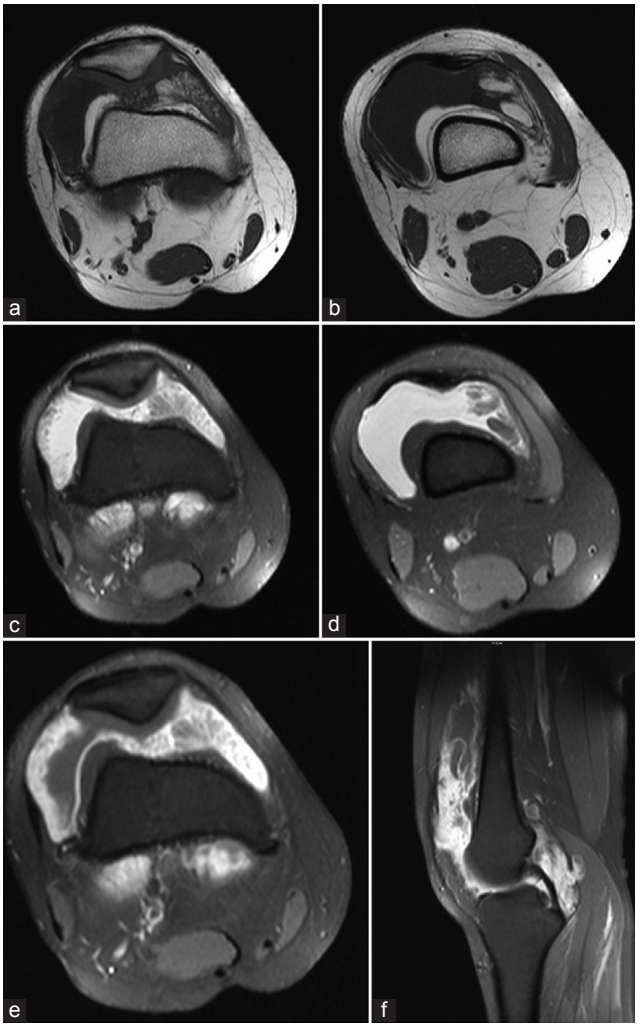
A 25-year-old male patient presented with pain and swelling around right knee joint. There was no history of trauma to the knee or recent episode of fever. He had a similar episode 2 months earlier and was treated with oral medications, nature of which is not known. Clinical examination revealed suprapatellar fullness; however, there was no joint tenderness or redness of the overlying skin. There was neither similar medical family history nor any complaints in other axial or sacroiliac joints.

A plain radiography of knee joints was advised, which showed neither bony or articular abnormality nor any periarticular osteopenia. Suprapatellar fullness was noted. A diagnostic aspiration of the synovial fluid turned out to be inflammatory in nature (white blood cell count 8600/mm^3; polymorphs 93%; lymphocytes 2%, and mononuclear cells 5%). Rheumatoid factor, anticyclic citrullinated peptide antibodies, and antinuclear antibody tests were negative. A provisional diagnosis of inflammatory synovitis was considered. He was advised MRI knee to look for any synovial or intra-articular pathology. MRI showed frond-like intra-articular synovial masses, which were hyperintense on both T1W and T2W sequences suggestive of fatty origin. This was confirmed on fat-saturation sequences, when the lesion became hypointense. There was no evidence of underlying bone erosions or degenerative changes. Gadolinium-enhanced MRI showed synovial enhancement with mild thickening (Fig. 1). Thus, a diagnosis of LA with inflammatory synovitis was made. The patient underwent arthroscopy, which showed pinkish–white frond-like proliferation along synovial lining in suprapatellar region (Fig. 2). Therapeutic synovectomy was performed and histopathological examination showed them to be composed of mature adipocytes with chronic inflammatory cells (Fig. 3). The patient was last examined clinically as well by high-frequency ultrasound at 5-month follow-up. He has no recurrence or further complaints in other joint. There was no positive finding on ultrasound imaging.

Case 2

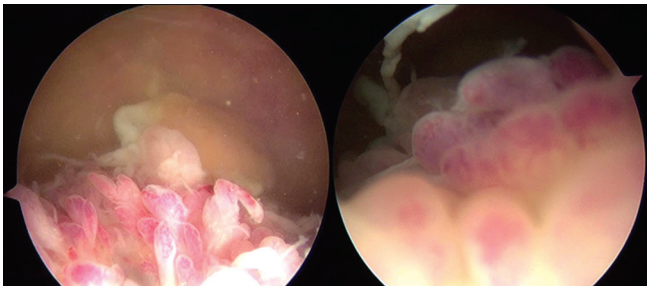
An 18-year-old female patient presented with acute onset of pain and swelling around left knee joint. There was no history of recent episode of fever or trauma. Mild suprapatellar fullness was noted with

Figure 1



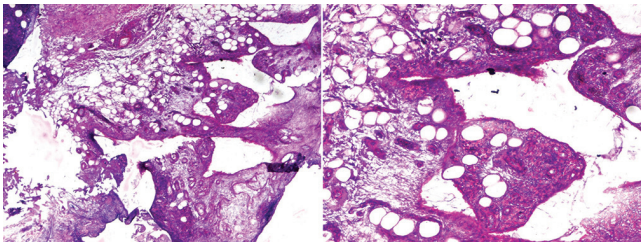
Axial T1 weighted MRI (a, b) shows suprapatellar effusion with frond-like synovial masses. Fat-saturated axial T2W MRI (c, d) confirms the fatty nature of synovial masses. Gadolinium-enhanced axial and sagittal T1W fat-suppressed MRI (e, f) shows no enhancement of the fatty synovial mass but enhancement of the synovial lining.

Figure 2



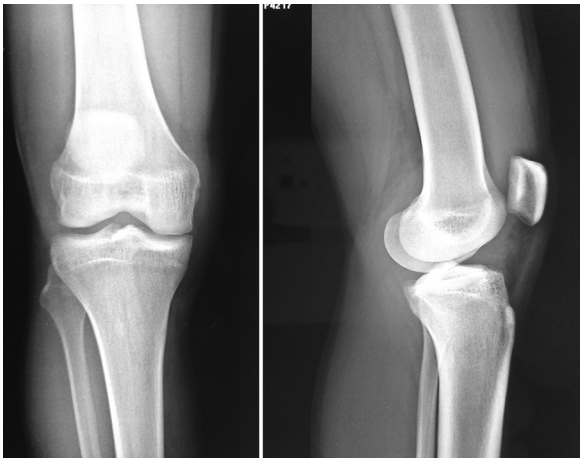
Arthroscopy image shows pinkish–white frond-like proliferation along synovial lining in suprapatellar region.

Figure 3



Villous projections show accumulation of mature adipose tissue that is covered by layers of hyperplastic synovial cells. Focal chronic inflammatory infiltrate and dilatation of capillaries are present (hematoxylin and eosin stain, ×40 and ×400 magnification).

Figure 4



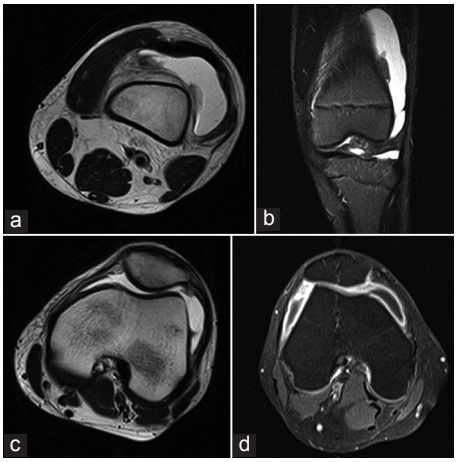
Radiograph of the knee joint (AP and lateral view) shows no bony or articular abnormality. Suprapatellar fullness is seen. AP, anteroposterior.

no joint tenderness or redness of the overlying skin. Radiography ruled out any bony, articular abnormality or periarticular osteopenia (Fig. 4). Rheumatoid factor, antinuclear antibody, and anti-citrullinated peptide antibodies were also negative. Diagnostic synovial fluid aspiration was inflammatory in nature. MRI knee was advised, which showed villous projection arising from the synovium of fatty nature confirming LA. Gadolinium-enhanced MRI showed mild synovial thickening with enhancement (Fig. 5). The patient underwent therapeutic arthroscopic synovectomy. Histopathological examination showed that the villi were composed of mature fat tissue and chronic inflammatory cells. The patient was last seen clinically at 7-month follow-up. She has progressed well with no further complaints in the joint.

Discussion

LA usually involves single joint [3,5,7], and bilateral and multifocal disease is relatively less common [7,8]. By far, the most common joint to be involved is knee joint [9]. Rarely, disease in other joints such as ankle, shoulder, and elbow has also been reported [3]. In the knee, suprapatellar fossa is most commonly involved. The disease is commonly seen in the third to fifth decade of life. There is no sex predilection reported with

Figure 5



Axial T2 weighted (a, c) shows joint effusion with frond-like synovial masses of fat intensity. Coronal STIR MRI (b) confirms the fatty nature of synovial masses. Gadolinium-enhanced axial T1W fat-suppressed MRI (d) shows enhancement of the synovial lining.

this disease condition. Common presentation is with painless, slowly progressive swelling of the joint with intermittent and/or recurrent effusion and restricted range of movement.

LA can be an underlying cause for undiagnosed inflammatory synovitis as suggested by Ragab *et al.* [4]. Oni and Oni [5] suggested that chronic synovitis could be an underlying cause for LA Santiago *et al.* [6] reported polyarticular LA associated with chronic inflammatory synovitis mimicking rheumatoid arthritis. The significance of this association is change in management of these patients as they will undergo arthroscopic synovectomy.

The investigation of choice is MRI [10,11]. LA follows signal characteristics of fat on MRI with fat-saturation sequence confirms the diagnosis. Thus, the disease can be confidently diagnosed on MRI, helping in planning proper management and follow-up, if needed. Vilanova *et al.* [11] in their study reported that the most commonly associated MR pathology in the knee was joint effusion (100%) followed by degenerative changes (87%) and meniscal tear (72%). The histopathological examination of the excision biopsy confirms the diagnosis [8].

The differential diagnoses to be considered are pigmented villonodular synovitis, synovial osteochondromatosis, chronic rheumatoid arthritis, synovial lipoma, and synovial hemangioma [9]. Pigmented villonodular synovitis characteristically shows low signal intensity on all pulse sequences due to hemosiderin deposition, whereas synovial osteochondromatosis and chronic rheumatoid arthritis show low-to-intermediate signal intensity on T1W sequence. The closest mimic is synovial lipoma, which follows same signal intensity on MRI but presents as a focal mass of fat in and around Hoffa's fat pad. The synovial hemangioma shows foci of low signal intensity corresponding to phleboliths.

The definite treatment is either an open or an arthroscopic synovectomy [12]. There are reports of successful treatment using 185 MBq yttrium-90 colloid [13]. Follow-up is usually advised to rule out recurrence, which is rare. We experienced difficulty in follow-up by MR imaging because of the cost strain and availability. We performed follow-up by clinical examination and by ultrasound. Ultrasonography can be a good imaging modality in follow-up because it is widely available, cheap, and in experienced hands easy to perform. We are of the opinion that ultrasound should have been used at the time of diagnosis. This helps in follow-up by an imaging method in addition to the clinical examination.

Conclusion

These two cases of young adults further signify the role of MRI in undiagnosed inflammatory synovitis in young patients. MRI helped in reaching the diagnosis as well as changed the management. The significant symptomatic improvement seen on follow-up further helps to strengthen the hypothesis that underlying LA could be a rare underlying cause for inflammatory synovitis in young adults.

Acknowledgements

Conflicts of interest

None declared.

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