Int. J Med. Pharm. Res. (P-ISSN: 2958-3675 | E-ISSN: 2958-3683)
Available on: https://ijmpr.in/

International Journal
of Medical and Pharmaceutical Research

CASE REPORT **OPEN ACCESS**

Synovial Proliferation in Disguise: Case Series of Lipoma Arborescens

Dr Sandeep kumar[1],Dr. Vijaya Rajesh Kamble [2],Dr Vishal Gupta [3],Dr Rupanshi Jain[4],Dr Avantika Singh[5]

Resident Department of Radiology SMS&R[1], Professor Department of Radiology SMS&R[2,] H.O.D &Professor Department of Radiology SMS&R[3],Resident Department of Radiology SMS&R[4&5]

OPEN ACCESS

***Corresponding Author**
Dr Vijaya Rajesh Kamble
Professor Department of Radiology SMS&R

Received: 13-01-2025
Accepted: 15-02-2025
Available online: 23-02-2025

A B S T R A C T

Introduction: Lipoma Arborescens (LA) is a rare, benign synovial condition, primarily affecting the knee, characterized by the growth of adipocytes within the synovial membrane.

Case Presentation:

Patient 1:A23 year-old male presented with left knee pain and swelling for three months. . Symptoms included stiffness, particularly after rest, and progressive limitation of joint mobility.

Patient 2 :A 25 -year-old male presented with right knee pain and swelling for 8 years. Symptoms included stiffness, particularly after rest, and progressive limitation of joint mobility.

Patient 3 :A 22-year-old male presented with progressive swelling and intermittent pain in the leftknee for duration of 2 years . The symptoms were associated with mild stiffness and reduced range of motion.

Patient 4 : A 32-year-old male presented with chronic swelling and intermittent pain in the rightknee over the past 5 years . Symptoms included stiffness, particularly after rest, and progressive limitation of joint mobility.

There was no history of trauma, systemic symptoms, or prior joint disease in these patients. On examination, a soft, mobile, non-tender mass was palpable, with reduced range of motion

Conclusion: Recognizing the MRI features of LA is crucial for accurate diagnosis. Arthroscopic synovectomy offers effective treatment with excellent outcomes.MRI showed characteristic frond-like synovial masses, leading to a diagnosis of LA, confirmed by arthroscopic biopsy.

Keywords: Lipoma arborescens, Knee joint, Synovial proliferation, Magnetic resonance imaging (MRI), Frond-like mass

INTRODUCTION

Lipoma arborescens is a rare intra-articular lesion characterized by villous lipomatous proliferation of the synovium, most commonly affecting the knee joint, particularly the suprapatellar pouch. While previous literature has reported cases of this condition, we present MR findings from four cases of lipoma arborescens of the knee. These findings include a large frond-like synovial mass with signal intensity identical to fat on all pulse sequences, along with an associated joint effusion. No magnetic susceptibility effects from hemosiderin were observed.

Case Presentation:

Patient 1 : A 23 year-old male presented with left knee pain and swelling for three months. . Symptoms included stiffness, particularly after rest, and progressive limitation of joint mobility.

Patient 2 : A 25 -year-old male presented with right knee pain and swelling for 8 years. Symptoms included stiffness, particularly after rest, and progressive limitation of joint mobility.

Patient 3 : A 22-year-old male presented with progressive swelling and intermittent pain in the left knee for duration of 2 years . The symptoms were associated with mild stiffness and reduced range of motion.

Patient 4 : A 32-year-old male presented with chronic swelling and intermittent pain in the right knee over the past 5 years . Symptoms included stiffness, particularly after rest, and progressive limitation of joint mobility.
MRI of the knee showed frond-like synovial masses with high signal intensity on T1-weighted images and suppressed fat signal on STIR sequences, suggestive of LA. The diagnosis was confirmed through arthroscopic biopsy. The patient underwent arthroscopic synovectomy.

Conclusion: This case underscores the importance of recognizing LA's characteristic MRI features for accurate diagnosis and management. Arthroscopic synovectomy is an effective treatment, providing excellent outcomes with minimal recurrence. Awareness of this rare entity is crucial for radiologists and orthopaedic surgeons to ensure appropriate patient care.

Imaging findings:
Patient 1 :

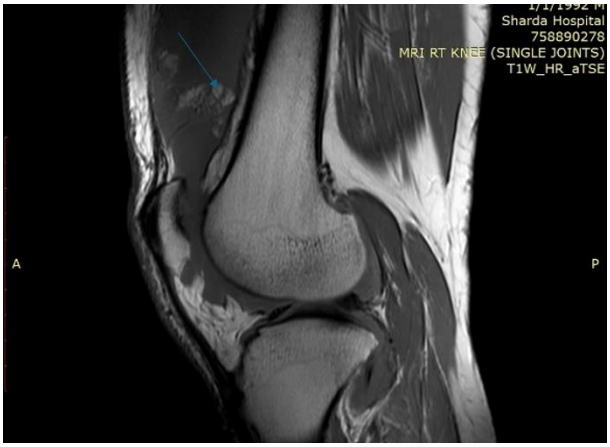

Figure 1. sagittal T1 Weightedimage

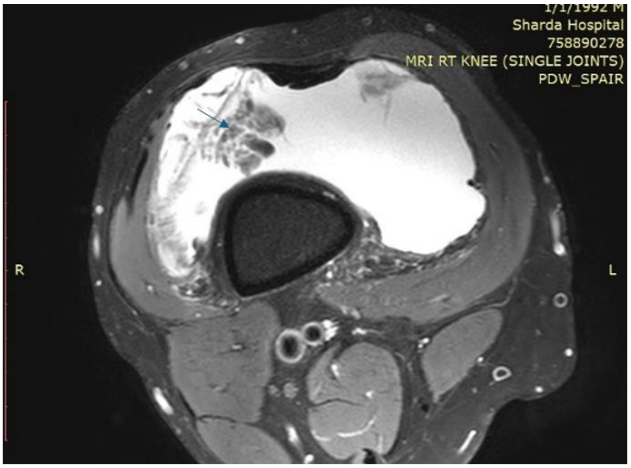

Figure 2. AxialProton density weighted image with Fat Suppression

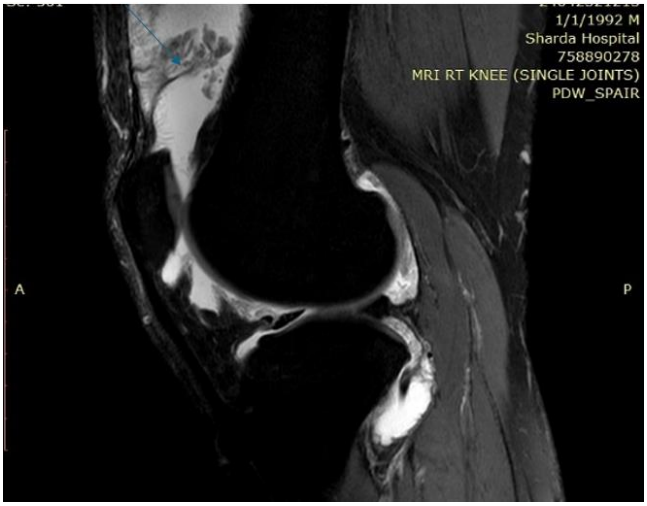

Figure 3.Sagittal Proton density weighted image with Fat Suppression

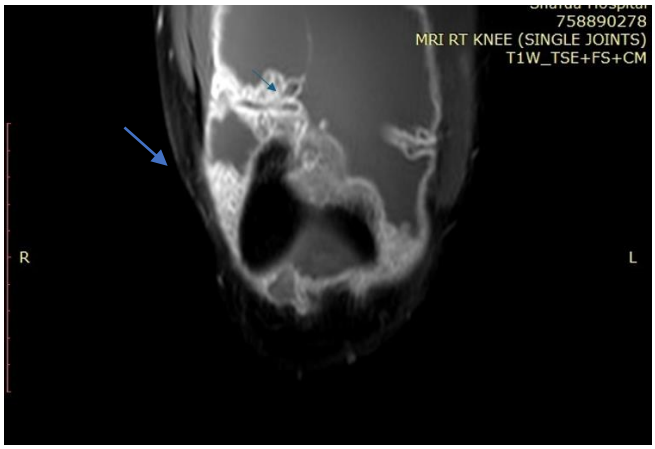

Figure 4.Coronal T1 Weighted Post contrast image with fat saturation

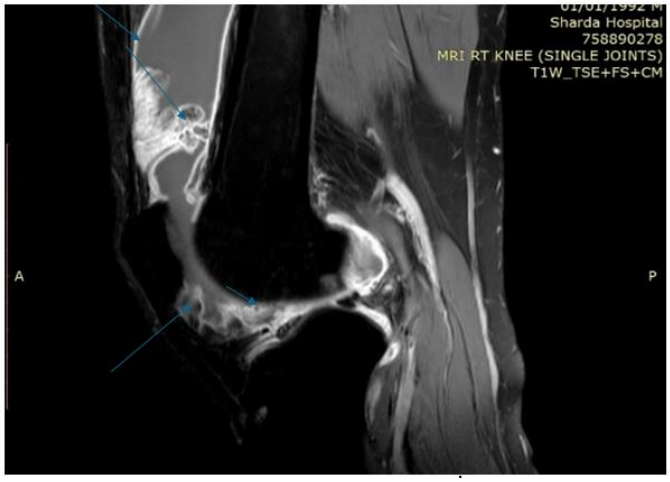

Figure 5.Sagittal T1 Weighted post contrast image with fat saturation

MR images on sagittal T1-weighted (1), axial (2) and sagittal PD-weighted with fat saturation (FS) (3), and axial (4), coronal(5) and sagittal (f) T1-weighted with FS after iv administration of gadolinium respectively, depict frond-like villi projecting inwards from the synovium with signal equal to fat on all imaging sequences (short arrows) . After iv administration of gadolinium, enhancement of the overlying synovium isobserved (long arrows), but no enhancement of the underlying fat is detected.

Patient 2:

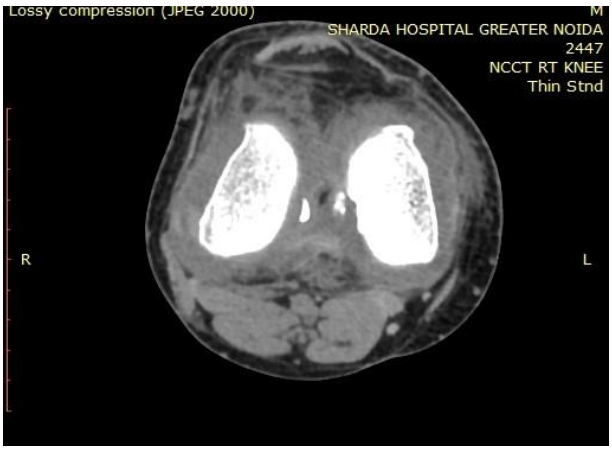

Figure 1. Axial CT image.

Figure 2. ReconstructedSagittal Image.

CT images on axial (1) and reconstructed sagittal (2) plane in soft tissue window reveal a low-density intra-articular mass similar to fat with multiple villous projecting inwards (arrows),

Figure 1. sagittal T1 Weighted image

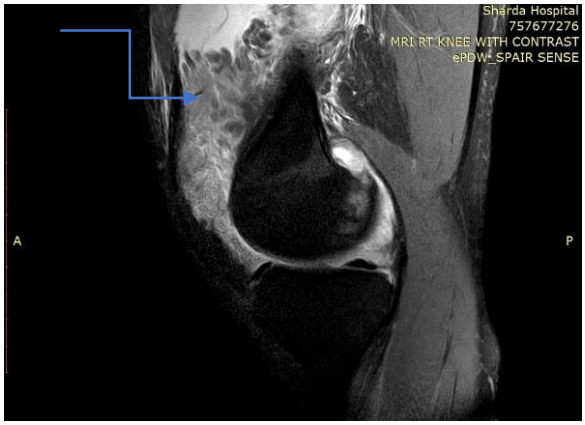

Figure 2 .Sagittal Proton density weighted image with Fat Suppression

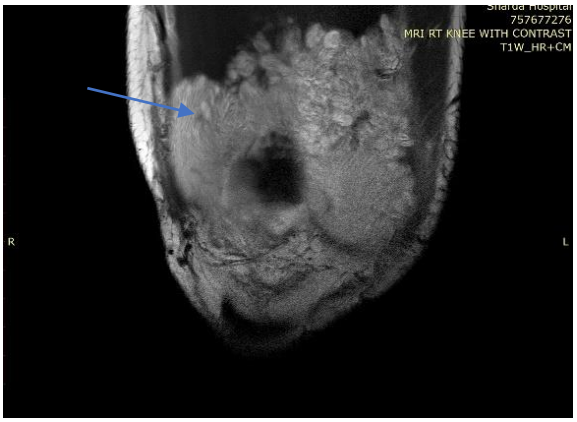

Figure 3. Coronal T1 weighted post contrast image

MR images on sagittal T1-weighted (1) and sagittal PD-weighted with fat saturation (FS) (2), and, coronalT1-weighted after iv administration of gadolinium (3), respectively, depict frond-like villi projecting inwards from the synovium with signal equal to fat on all imaging sequences (short arrows). After iv administration of gadolinium, enhancement of the overlying synovium is observed, but no enhancement of the underlying fat is detected.

Patient 3:

Figure 1. Sagittal T1 Weighted Image

Figure 2 .Sagittal Proton density weighted image with Fat Suppression

MR images on sagittal T1-weighted (1) and sagittal PD-weighted with fat saturation (FS) (2), respectively, depict frond-like villi projecting inwards from the synovium with signal equal to fat on all imaging sequences (short arrows).

Patient 4 :

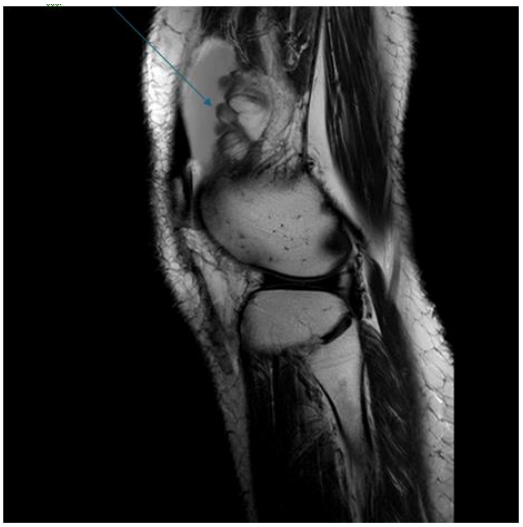

Figure 1. Sagittal T1 Weighted Image

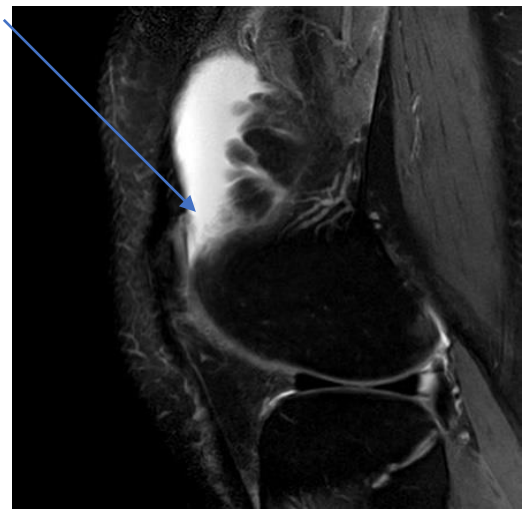

Figure 2. Sagittal Proton density weighted image with Fat Suppression

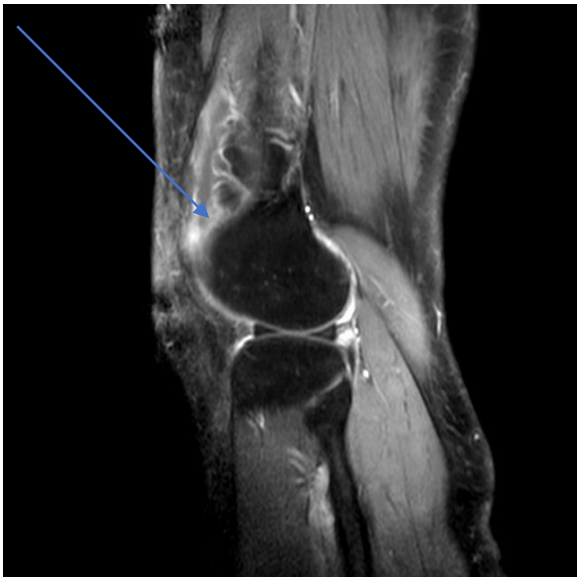

Figure 3sagittal T1-weighted image after iv administration

MR images on sagittal T1-weighted (1) and sagittal PD-weighted with fat saturation (FS)(2)and sagittal T1-weighted after iv administration of gadolinium (3) ,respectively, depict frond-like villi projecting inwards from the synovium with signal equal to fat on all imaging sequences. After iv administration of gadolinium, enhancement of the overlying synovium is observed, but no enhancement of the underlying fat is detected.

DISCUSSION:

Lipoma arborescens is an uncommon condition marked by the transformation of sub synovial tissue into mature adipose cells, forming frond-like projections on the synovial surfaces of the affected joint. While it typically presents as a monoarticular condition, most commonly in the knee joint, it can also occur bilaterally or in other joints such as the hips, shoulders, wrists, and elbows.(1).

Hoffa was the first to describe the frond-like structure, comparing it to a tree in leaf, which led to the adoption of the Latin term “arborescens’ (“tree-forming” or “treelike”). Groundbreaking research by Hallel et al. further defined the clinical and pathological characteristics of the condition, distinguishing it from more typical types of synovial overgrowth. Their study also established synovectomy as an effective treatment, a finding later confirmed by additional studies.(2)

Plain radiographs of lipoma arborescens typically reveal joint effusion or a mass density within the affected joints. Chronic mechanical stress and injuries may predispose these joints to early osteoarthritic changes. Direct radiographic evidence of fat content, as seen in our patient, is rarely reported. Sonography can demonstrate a villous structure and hyperechogenicity. Computed tomography (CT) may reveal an intraarticular frond-like mass with low attenuation characteristic of fat, along with variable effusions, degenerative changes, and the lesion's extent. MRI depicts an intraarticular synovial mass with a frond-like appearance and high signal intensity, which is suppressed by fat-selective presaturation. The presence of hemosiderin or calcifications does not affect magnetic susceptibility. Additionally, gadolinium diethylenetriamine Penta acetic acid (Gd-DTPA) injection shows no enhancement, excluding inflammatory or neoplastic synovial processes.(3).

Lipoma arborescens was previously difficult to diagnose without MR imaging. In the mid-1990s, there were only 13 instances recorded in the literature.

The vague clinical presentation and conventional radiographic findings necessitated validation through surgical and pathological assessment. Although traditional arthroscopy enhanced diagnostic sensitivity, it lacked specificity. Differential diagnoses, such as synovial chondromatosis and pigmented villonodular synovitis, were also considered. While computed tomography was available, MRI emerged as the most dependable diagnostic method due to its superior contrast resolution and increased sensitivity in identifying fatty tissues(4).

Several case reports have described lipoma arborescens in young adults and children. Prior to the availability of MRI, some cases were misdiagnosed as rheumatoid arthritis or other inflammatory synovial conditions. In one significant instance, a 13-year-old child presented with bilateral knee swelling for eight years, without notable pain, and was initially diagnosed with juvenile rheumatoid arthritis. After conventional treatments proved ineffective, MRI identified lipoma arborescens. A synovectomy was subsequently performed, resulting in a rapid and long-lasting cure, underscoring the misdiagnosis of the initial condition(5). In two cases of young women with unilateral knee symptoms, the initial diagnosis was idiopathic synovitis, based mainly on cellular analysis of joint aspirates. However, follow-up MRI scans revealed lipoma arborescens in both patients. Both underwent synovectomy, which effectively treated the condition.(6)

Santiago et al. (5) reported the case of a 29-year-old woman who had experienced intermittent arthritis in her wrists, knees, and ankles for 12 years. Initially diagnosed with rheumatoid arthritis, she was treated with methotrexate. However, MRI scans of her knees and hips later revealed lipoma arborescens. Histological analysis of synovectomy specimens showed fibrosis, inflammatory mononuclear infiltration, and fatty tissue proliferation. Although the patient experienced some postoperative symptom improvement, she did not fully recover and continued to require anti-inflammatory treatment. The authors concluded that polyarticular lipoma arborescens can be mistaken for rheumatoid arthritis, emphasizing the importance of accurate diagnosis(7).

The differential diagnosis should consider all conditions that cause synovial thickening and painless effusion. Synovial lipomas, which usually appear round or oval, typically develop in the infrapatellar bursa.

On plain radiographs, synovial osteochondromatosis commonly presents with characteristic chondroid calcifications (8). On T1-weighted MRI, loose bodies containing marrow display a high signal intensity from the fat marrow, with a signal void in the centre. T2-weighted imaging shows variable signal intensities based on the level of chondroid calcification. In contrast, pigmented villonodular synovitis appears with low signal intensity on both T1- and T2-weighted images due to the paramagnetic effects of hemosiderin(9).

Findings from the current cases further highlight the advantages of MRI in tissue characterization for lipoma arborescens. The growing use of MRI enables more accurate preoperative diagnoses and the identification of smaller lesions, thereby supporting precise surgical planning essential for effective treatment of this condition.

REFERENCES

1. **Tai CM, Huang CK, Lee YC, Lin TJ, Chang CY, Wang W, et al.** Laparoscopic gastric bypass for morbid obesity: early experience at a medical center in Taiwan. *J Formos Med Assoc.* 2001 Jun;100(6):404-9.
2. Coll, J. P., Ragsdale, B. D., Chow, B., & Daughters, T. C. (2011). *Best Cases from the AFIP: Lipoma Arborescens of the Knees in a Patient with Rheumatoid Arthritis. RadioGraphics, 31(2), 333–337.* doi:10.1148/rg.312095209
3. Chaljub G, Johnson PR: In vivo MRI characteristics of lipoma arborescens utilizing fat suppression and contrast administration. J Comput Assist Tomogr1996;20:85–7.
4. Burgan DW. Lipoma arborescens of the knee: another cause of filling defects on a knee arthrogram Radiology 1971;101(3):583–584.
5. Cil A, Atay OA, Aydingöz U, Tetik O, GedikoğluG,Doral MN. Bilateral lipoma arborescens of the knee in a child: a case report. Knee Surg Sports Trauma- tolArthrosc 2005;13(6):463–467.
6. Ragab Y, Emad Y, Banakhar A. Inflammatory synovitis due to underlying lipoma arborescens (gadolinium-enhanced MRI features): report of two cases. Clin Rheumatol 2007;26(10):1791–1794.
7. Santiago M, Passos AS, Medeiros AF, Sá D, Correia Silva TM, Fernandes JL. Polyarticular lipoma arborescens with inflammatory synovitis. J Clin Rheumatol 2009;15(6):306–308.
8. Martin S, Hernandez L, Romero J, et al: Diagnostic image of lipoma arborescens. Skeletal Radiol1998;27:325–9.
9. Donnelly LF, Bisset GS III, Passo MH: MRI findings of lipoma arborescens of the knee in a child: case report PediatrRadiol 1994;24:258–9