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## **Lipoma Arborescens of the Knee: Characteristic MRI Features and Literature Review**

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### **ABSTRACT**

Lipoma arborescens (LA) is an uncommon benign, non-neoplastic synovial lesion characterized by villous replacement of the subsynovial tissue by mature adipose tissue. It most often involves the knee, particularly the suprapatellar recess, and typically presents with chronic swelling and recurrent joint effusion. We report the case of a 63-year-old man with a five-month history of progressive left knee swelling and recurrent effusions. Magnetic resonance imaging (MRI) demonstrated a frond-like synovial proliferation with signal characteristics of fat, including high signal intensity on T1-weighted images and suppression on fat-saturated sequences, associated with joint effusion and enhancement confined to the synovial lining. The patient underwent open total synovectomy, and histopathological examination confirmed the diagnosis. Symptoms resolved postoperatively, with no clinical evidence of recurrence at the latest follow-up. Recognition of this characteristic MRI pattern enables a confident preoperative diagnosis, helps guide surgical management, and may reduce unnecessary diagnostic procedures.

### **KEYWORDS**

Lipoma arborescens, knee, synovium, joint effusion, synovectomy.

**Abbreviations:** LA, lipoma arborescens; MRI, magnetic resonance imaging; PD-FS, proton-density fat-saturated; TGCT, tenosynovial giant cell tumor.

## **MAIN ARTICLE**

### **INTRODUCTION**

Lipoma arborescens (LA), also termed synovial lipomatosis, is a rare benign villous proliferation of the synovium in which the subsynovial connective tissue is replaced by mature adipocytes [1,2]. Despite its name, LA is generally regarded as a tumor-like, non-neoplastic process. The term arborescens, derived from the Latin arbor (tree), describes the characteristic branching, frond-like architecture of the lesion.

The knee is the most frequently involved joint, with the suprapatellar recess representing the classic site. Less commonly, LA may involve the hip, shoulder, elbow, ankle, wrist, or an extra-articular bursa. Primary idiopathic and secondary forms have historically been described, although this distinction is not always clear-cut. Secondary LA is more often associated with chronic synovial irritation related to osteoarthritis, previous trauma, inflammatory arthropathy, or meniscal disease [2,3].

Clinical findings are usually nonspecific and include slowly progressive joint swelling, recurrent painless or mildly painful effusions, stiffness, and limited range of motion. Consequently, the diagnosis may be delayed or mistaken for inflammatory or degenerative arthropathy. MRI is the imaging modality of choice because it directly demonstrates the fatty composition and villous morphology of the synovial proliferation [1,4].

We present a case of LA of the knee in a 63-year-old man, emphasizing its characteristic MRI findings, relevant differential diagnoses, and treatment considerations.

### **CASE PRESENTATION**

A 63-year-old man with no significant medical history presented with a five-month history of progressive swelling of the left knee and recurrent episodes of joint effusion. Pain was insidious in onset and gradually worsened. There was no history of trauma or other clear precipitating factor. Nonsteroidal anti-inflammatory drugs and intra-articular corticosteroid injections had provided no sustained relief, prompting referral to the Rheumatology Department.

Physical examination showed diffuse swelling of the left knee, most pronounced in the suprapatellar region, without marked tenderness. The patellar tap test was positive, consistent with a substantial joint effusion. Range of motion was mildly restricted by swelling; the remainder of the musculoskeletal examination was unremarkable.

Available laboratory investigations, including the white blood cell count and serum uric acid level, were within normal limits. There were no clinical features suggestive of systemic infection or inflammatory arthropathy.

Conventional radiographs demonstrated suprapatellar soft-tissue fullness consistent with joint effusion, without focal osseous abnormality.

MRI revealed diffuse frond-like villous synovial proliferation within the suprapatellar recess. The projections were hyperintense on T1-weighted images and showed complete signal suppression on proton-density fat-saturated (PD-FS) sequences, confirming their fatty composition. A moderate joint effusion outlined the villous projections. On post-gadolinium T1-weighted fat-suppressed images, the fatty cores remained non-enhancing, whereas the synovial lining and adjacent hypertrophic synovium enhanced. No associated meniscal tear, ligamentous injury, or osseous lesion was identified. The MRI appearance was highly characteristic of lipoma arborescens (Figure 1).

Three months later, the patient underwent open total synovectomy with complete excision of the hypertrophic synovial tissue. Histopathological examination demonstrated villous synovial proliferation with replacement of the subsynovial connective tissue by mature adipocytes, confirming the diagnosis.

The postoperative course was uneventful. At the latest clinical follow-up, swelling and pain had resolved, with no clinical evidence of recurrence.

## **DISCUSSION**

Lipoma arborescens (LA) is an uncommon benign intra-articular lesion characterized by diffuse villous proliferation of the synovial membrane with replacement of the subsynovial connective tissue by mature adipocytes [1,2,3]. Although its exact pathogenesis remains uncertain, primary idiopathic and secondary forms have been described. The primary form is generally considered idiopathic, whereas the secondary form is associated with chronic synovial irritation related to conditions such as osteoarthritis, previous trauma, inflammatory arthropathy, or meniscal disease [2,3]. Although our patient was in the age group more commonly associated with secondary LA, no clear predisposing factor was identified.

The knee, particularly the suprapatellar recess, is the most frequent site of involvement, although LA has also been reported in the shoulder, hip, elbow, ankle, and wrist [2,3]. Patients typically present with slowly progressive joint swelling and recurrent painless or mildly painful

effusions that may persist for months or years before diagnosis. Joint stiffness and limitation of motion may develop as the lesion enlarges, while laboratory investigations are often unremarkable [2,3]. These nonspecific manifestations may delay diagnosis and lead to an initial suspicion of inflammatory or degenerative arthropathy.

MRI is the imaging modality of choice for the diagnosis of LA because of its excellent soft-tissue contrast and ability to characterize fatty tissue [5]. The hallmark finding is a frond-like or villous synovial proliferation that follows the signal characteristics of subcutaneous fat, with high signal intensity on T1-weighted images and complete suppression on fat-saturated sequences. After gadolinium administration, the fatty villous cores typically remain non-enhancing, whereas the synovial lining may enhance. Joint effusion is frequently associated and further delineates the villous projections [1,5]. These characteristic findings were present in our patient and enabled a confident preoperative diagnosis.

Although the MRI appearance of LA is highly characteristic, several synovial disorders should be considered in the differential diagnosis. Pigmented villonodular synovitis, now classified within tenosynovial giant cell tumor (TGCT), may also present with synovial proliferation; however, hemosiderin deposition produces low signal intensity and characteristic blooming on susceptibility-sensitive or gradient-echo sequences, unlike LA [4]. Synovial chondromatosis is characterized by multiple cartilaginous or osteochondral loose bodies that do not demonstrate fat signal and may calcify or ossify [4]. Rheumatoid arthritis typically presents with hypertrophic inflammatory pannus, erosive changes, and a different clinical context rather than fatty villous synovial proliferation [2]. Other differential diagnoses include synovial hemangioma, which shows vascular signal characteristics and contrast enhancement, and true intra-articular lipoma, which appears as a solitary, well-circumscribed fatty mass rather than a diffuse frond-like proliferation [1,2].

Although MRI can strongly suggest the diagnosis, histopathological examination provides definitive confirmation when tissue is obtained. Microscopically, LA is characterized by diffuse villous synovial proliferation with replacement of the subsynovial connective tissue by mature adipocytes. Variable chronic inflammatory cell infiltration, mild fibrosis, and vascular proliferation may also be observed, reflecting chronic synovial irritation rather than neoplastic transformation [2,3]. Histopathological examination of the surgical specimen in our patient confirmed these characteristic findings.

Complete synovectomy is the treatment of choice for symptomatic patients. Depending on the extent and location of the lesion, the procedure may be performed arthroscopically or through an open approach. Arthroscopic synovectomy is less invasive and may allow faster postoperative recovery, whereas open synovectomy can be considered for extensive lesions or when complete excision cannot be achieved arthroscopically [3]. Surgical treatment is generally associated with substantial symptom relief, and recurrence is uncommon after complete excision [1,3]. In the present case, open total synovectomy resulted in complete clinical resolution of symptoms, with no evidence of recurrence at the latest follow-up.

This case highlights the importance of recognizing the characteristic MRI appearance of lipoma arborescens in patients with chronic knee swelling and recurrent joint effusion. Accurate radiological diagnosis facilitates appropriate treatment planning and may help avoid unnecessary diagnostic interventions.

## **CONCLUSION**

Lipoma arborescens is an uncommon benign synovial proliferation that should be considered in patients with chronic knee swelling and recurrent joint effusion. MRI is often diagnostic when it demonstrates frond-like synovial tissue with fat signal characteristics, associated joint effusion, and, when contrast is administered, enhancement limited to the synovial lining rather than the fatty cores. Careful assessment of lesion extent and associated joint abnormalities is important for treatment planning. Symptomatic lesions are effectively managed with complete arthroscopic or open synovectomy, and recurrence is uncommon after adequate excision.

## FIGURES:

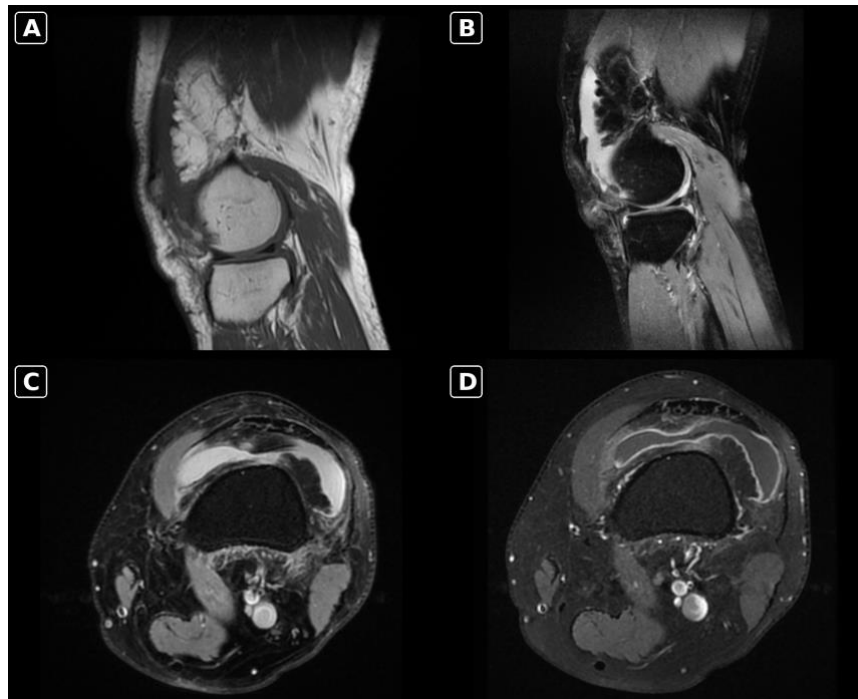


Figure 1. MRI appearance of lipoma arborescens. (A) Sagittal T1-weighted image shows frond-like hyperintense synovial projections in the suprapatellar recess, following the signal intensity of subcutaneous fat. (B) Sagittal and (C) axial PD-FS images demonstrate suppression of the fatty villi, which are outlined by a moderate joint effusion. (D) Axial post-gadolinium T1-weighted fat-suppressed image shows non-enhancement of the fatty villous cores with enhancement of the synovial lining.

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## REFERENCES

1. Ouazzani Chahdi H, El Bouardi N, Ferhi M, et al. Lipoma arborescens of the knee: a case report. *Radiology Case Reports*. 2024;19(6):2272-2276. doi:10.1016/j.radcr.2024.02.106. <https://doi.org/10.1016/j.radcr.2024.02.106>
2. Prabhakar V, Naik S. Lipoma arborescens of the knee: report of a case with a full range of motion and literature review. *Saudi Journal of Sports Medicine*. 2014;14(1):55. doi:10.4103/1319-6308.131629. <https://doi.org/10.4103/1319-6308.131629>
3. Lyrtzis C, Stamati A, Pantazis E, et al. Lipoma arborescens of the knee: a case report and comprehensive review. *Medical Reports*. 2023;1:100021. doi:10.1016/j.hmedic.2023.100021. <https://doi.org/10.1016/j.hmedic.2023.100021>
4. Choudhury SR, Prakash M, Sharma M, Sinha A, Chouhan DK. Magnetic resonance imaging of knee arthropathies: a pictorial review. *Journal of Clinical Orthopaedics and Trauma*. 2025;61:102872. doi:10.1016/j.jcot.2024.102872. <https://doi.org/10.1016/j.jcot.2024.102872>
5. Kadambila V, Karicheri Gangadharan V, Arif KS, et al. Lipoma Arborescens in the Knee Joint. *Cureus*. 2025;17(8):e89391. doi:10.7759/cureus.89391. <https://doi.org/10.7759/cureus.89391>