

## Lipoma Arborescens of the Knee: A Rare Cause of Gonalgia

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### Abstract

Lipoma arborescens is an infrequent cause of long-lasting arthritis affecting a single joint, with few cases reported in the literature. Although it commonly appears in the knee, instances have been observed in other joints such as the wrist, shoulder, and elbow. This condition is marked by widespread villous proliferation and the replacement of sub-synovial tissue with mature adipocytes. The use of magnetic resonance imaging (MRI) aids in refining and precisely identifying the potential diagnosis.

**Keywords:** Lipoma arborescens; Synovial; MRI

### Introduction

The etiology of this condition still remains unclear. Lipoma arborescens typically affects adults. It most commonly involves the knee, but other locations have also been described. People present with joint pain, swelling, and effusion. The diagnosis is based on the typical appearance on MRI, and the recommended treatment is open or arthroscopic synovectomy. Recurrence is uncommon.

### Case Report

A 62-year-old male patient reported experiencing pain and swelling in his left knee over a six-month period. The pain had a gradual onset and occurred intermittently, without specific aggravating or relieving factors. The patient denied any history of trauma. Initially, rest and nonsteroidal anti-inflammatory drugs were prescribed. However, due to the lack of response to this treatment, radiographs and MRI of the LEFT KNEE was performed, with T1 sagittal T2 sagittal and coronal T2 FatSat and transverse T1 FatSat, EG, and T1 axial FatSat sequences before and after injection (Figures 1-3).

A hypertrophied aspect of the supra-patellar synovial villi is thus noted, producing a fringed, tree-leaf appearance, with a fatty signal, erased after fat saturation, and associated with a moderately abundant joint effusion.



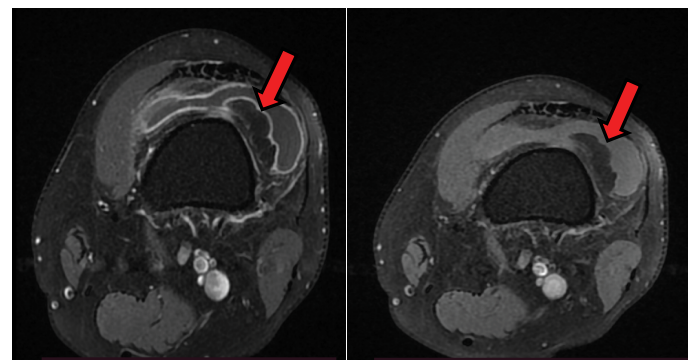
**Figure 1:** Sagittal T1, (left) Sagittal and coronal T2 FatSat (middle and right images) showing a villous fatty proliferation of the synovial membrane in the suprapatellar recess and fat suppression (right image).

There is also intrapatellar and extrapatellar femoral pinching, and patellar and tibial osteophytes.

### Discussion

Lipoma arborescens is a rare, mainly intra-articular lesion characterized by diffuse replacement of subsynovial tissue by mature fat cells, giving rise to a prominent villous transformation of the synovium [1,2]. It was first described by Hoffa in 1904, and more in detail in 1957 by Arzimanoglu [3,4]. The term lipoma is misleading because the lesion does not show any macroscopic or histological features of a neoplasm. Therefore, Hallel et al. suggested that lipomatous proliferation of the synovial membrane would be a more appropriate name [2]. The term arborescens comes from the word arbor (Latin for tree) and describes the macroscopically treelike morphology of this lipomatous villous synovial proliferation [5].

Although the lesion is usually located within a joint, involvement of the subdeltoid and bicipital bursa [6] and the synovial sheath of the peroneal tendons around the ankle joint has also been described [7].



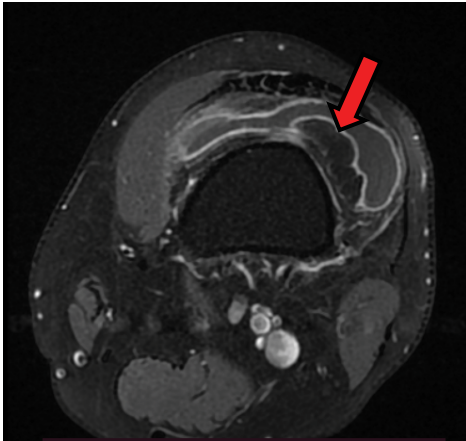
**Figure 2:** Transverse gradient echo (left) and Transverse T1 FatSat image through the patellofemoral joint clearly depicts extensive synovial proliferations in the in the suprapatellar recess.

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**Figure 3:** Transverse T1 FS after gado injection showing no enhancement.

Lipoma arborescens usually affects the knee, preferentially the suprapatellar pouch, but has also been reported to occur in other joints such as the hip [5], wrist [8], elbow [9], and shoulder [10]. Although the condition is mainly unilateral, bilateral involvement and multiple joint involvement have also been described [5,6,11,12].

Patients with lipoma arborescens often have a gradually worsening swelling of the affected joint, which may also be accompanied by effusion, a restricted range of motion, and pain. Laboratory tests are typically normal [13].

Conventional radiography often fails to detect such lesions due to their indistinct features. In this context, the significance of MRI becomes apparent. MRI plays a crucial role in early diagnosis by elucidating the nature of the lesion, its anatomical extensions, and any accompanying local pathology. The distinct signal it provides on MRI sets it apart from other mimicking lesions. Consequently, MRI is considered the most effective diagnostic method for assessing these lesions.

On T1WI/T2WI, the frond-like projections of lipoma arborescens exhibit hyperintensity, which gets suppressed on fat saturation sequences. On T2WI or STIR sequences, the remaining non-fatty portion of the hypertrophied synovium exhibits heterogeneous high signal intensity. In contrast, on T1-weighted sequences, it exhibits intermediate to low signal intensity and no blooming on gradient imaging. Many present with underlying conditions such as joint effusion, which may be observed on MRI. Additionally, meniscal tears and degenerative changes are seen as pathological causes for the formation of lipoma arborescens. Differential diagnosis includes secondary osteochondromatosis from underlying severe osteoarthritis, pigmented villonodular synovitis, synovial hemangioma, intra-articular lipoma, and intra-articular liposarcoma [14]. The preferred treatment for this condition is open or arthroscopic synovectomy;

however, underlying triggering factors must be addressed and treated accordingly. Arthroscopic synovectomy has always been preferred over open arthroscopic synovectomy, as there is early recovery and reduced hospital stay. Following surgery, the recurrence of the condition is negligible [15].

## Conclusion

Lipoma arborescens is characterized by villous frond-like lipomatous proliferation of the synovium. It is a rare cause of intra-articular mass and frequently presents with joint swelling and indolent synovitis. The typical MRI appearance of fatty synovial proliferation with no other signal intensities is pathognomonic for lipoma arborescens. Synovectomy is the preferred surgical management; however, additional interventions may be needed if underlying pathological or triggering factors are associated with these conditions.

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