


Review of a Rare Cause for Swelling of the Knee: Lipoma Arborescens

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ABSTRACT

Lipoma arborescens is an infrequent cause of chronic pain and swelling of the knee joint, and it is a slow-growing pseudo-tumoral lesion. Only very few cases are reported in the literature, It is most commonly seen in the knee joint, but involvement in other joints such as the wrist, shoulder, and elbow have also been reported. We report a case presented at our department with complaints of swelling of knee and pain for 1 year. The patient was evaluated and diagnosed with lipoma arborescence and was treated with total synovectomy. There is no recurrence at the end of 2 years of follow-up. In this case report, we describe the case involving the left knee and discuss the clinical presentation, diagnosis, histopathology, and treatment.

Keywords: Arthroscopy, Knee swelling, Synovectomy.

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INTRODUCTION

Lipoma arborescens is a rare benign tumor of the synovium in which mature fat cells replace the sub synovial tissue. Multiplying adipocytes are distended by fat and form villi which gives a tree-like appearance.^{1,2} It is considered as a nonspecific reactive response to chronic irritation of synovium, due to either mechanical or inflammatory insults. Lipoma arborescens typically affect adults. It most commonly involves the knee.³ Other sites such as the shoulder, the elbow, the wrist, the hip, and the ankle have also been described.⁴ Patients with this condition usually present with joint pain, swelling, and effusion. The diagnosis is based on the typical magnetic resonance imaging (MRI) appearance and pathognomonic histopathological picture. The recommended treatment is arthroscopic or open synovectomy. Bilateral involvement and recurrence are uncommon.⁵

CASE DESCRIPTION

A 48 years old man presented to the Department of Orthopaedics at our institution with complaints of swelling and pain in the knee for the past one and half years. On physical examination, there was painless, diffuse swelling in the suprapatellar area with effusion in the right knee joint. The patient had a restricted terminal flexion (15 degrees) and showed no signs of meniscal lesions, nor ligamentous laxity. Plain X-ray showed enhanced soft tissue shadow in the suprapatellar pouch (Fig. 1A). MRI depicted Frond-like villus projections of fat signal (Figs 1B and C) seen arising from the lower portion of the suprapatellar recess, in the popliteal fossa, and the infrapatellar region associated with gross collection in the suprapatellar recess into the joint from the synovium. Degenerative changes were noted in the meniscus, anterior cruciate ligament, and osteoarthritic changes with subarticular geodes in the lateral tibial condyle.

The patient underwent diagnostic arthroscopy and open total synovectomy. Arthroscopically yellowish villous projections (Fig. 2A) were seen arising from the synovium all over the joint. Degenerative changes were observed in both menisci. Open synovectomy was performed through a medial parapatellar

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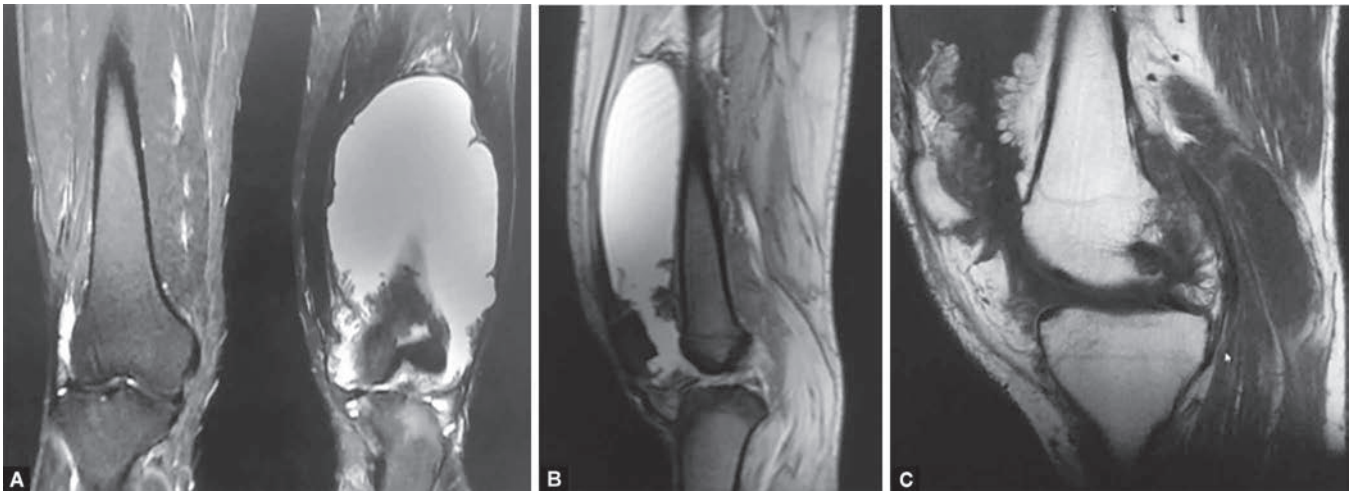
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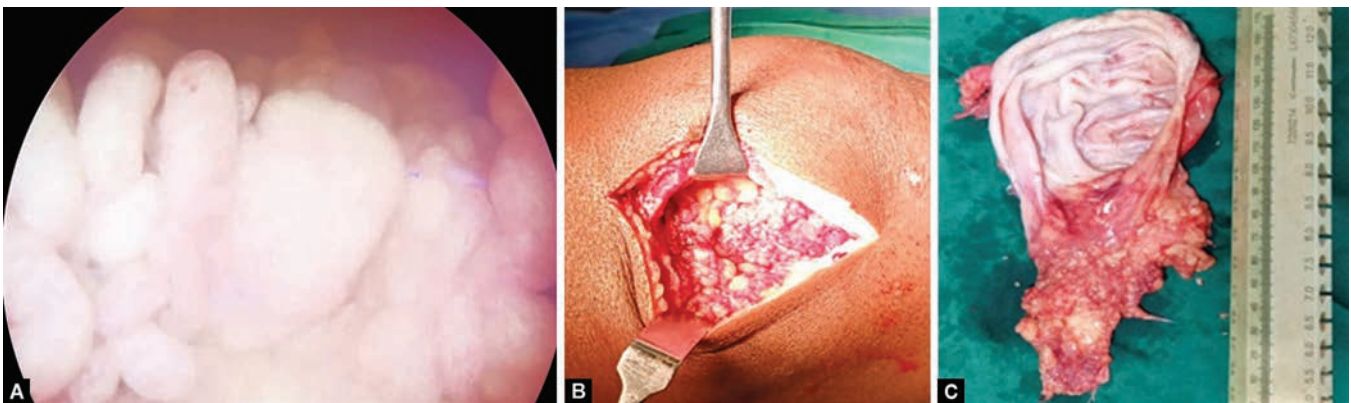
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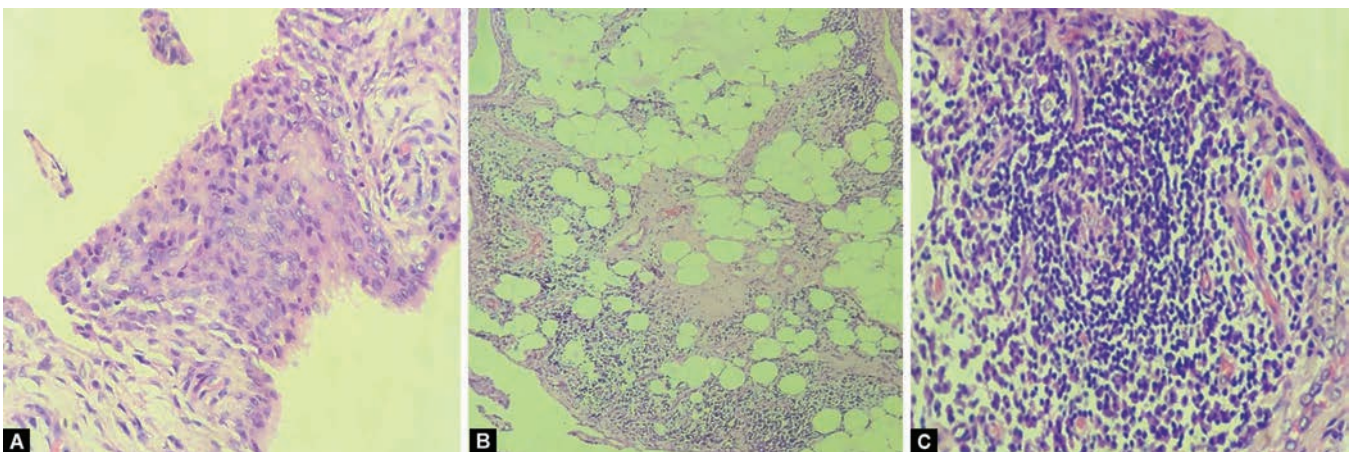
approach, revealing a yellowish villous mass (Fig. 2B) extending from the suprapatellar pouch to the medial and lateral gutters. Macroscopically excised tissue had a greyish yellow, Glistening pearly nodular appearance with fatty nodular villus projections. Samples were sent for histopathological examination (Fig. 2C). Microscopy showed synovial tissue composed of fibrofatty and fibro collagenous tissue lined by synoviocytes. Below the synoviocytes, dense chronic inflammatory cell infiltrate was seen (Fig. 3A). Inflammatory cell infiltrates were composed of predominantly plasma cells, few lymphocytes, and hemosiderin-laden macrophages. At places, congested blood vessels and fibrinoid deposition were seen. Also seen were villous projections lined by synoviocytes displaying focal synovial hyperplasia. Below the lining cells, chronic inflammatory cell infiltrate was seen. At places, mature adipocytes were seen arranged in lobules divided by fibrous septa of varying thicknesses (Fig. 3B). Activated lymphoid follicles and congested blood vessels were also seen (Fig. 3C). Features are suggestive of lipoma arborescens with chronic inflammation.



Figs 1A to C: (A) MRI image showing suprapatellar extension of the synovial swelling. (B) MRI images showing Frond-like villous projections. (C) MRI images showing Frond-like villous projections



Figs 2A to C: (A) Arthroscopic image showing villous projections of the synovium at the suprapatellar pouch. (B) Intraoperative image showing fatty nodular villous projections. (C) C-excised lipoma arborescens



Figs 3A to C: (A) Microphotography of tissue section displaying synovium with hyperplasia and hypertrophy. (B) Microphotography of tissue section displaying lobules of mature adipocytes replacing a significant portion of subsynovial tissue. (C) Microphotography of tissue section displaying diffuse inflammatory infiltrate, and activated lymphoid follicles

After surgery, the patient was started on quadriceps strengthening exercises; knee range of movements (ROM) exercises on a postoperative day 1, and weight-bearing mobilization to the

tolerance of pain. He was able to return to work and regained his pre-morbid functional status postoperatively by 1 month. The patient was followed up for 2 years, and there was no recurrence.

DISCUSSION

Hoffa first described lipoma arborescens in 1904.⁶ It is a rare benign tumor of synovium and very few cases have been reported in the literature. Incidence varies from 0.14–0.25%.⁷ It affects all age groups and is found to be associated with diabetes mellitus and steroid abuse.⁹ Late treatment leads to the early development of degenerative changes and chondral damage.

Usually, patients present with a history of trauma preceding swelling.⁸ Swelling is slowly progressive associated with pain, joint effusion, limited range of motion, locking, and degenerative changes. Diffuse synovial thickening is noted on examination. Probably mechanical trapping of villi inside the joint space could be the reason for locking.

Lipoma Arborescens (LA) is characterized by a diffuse replacement of sub synovial tissue by mature fat cells, giving rise to the villous transformation of the joint synovium. Common differential diagnosis is pigmented villonodular synovitis, synovial osteochondromatosis, rheumatoid arthritis, lipoma arborescens, synovial hemangioma, amyloid arthropathy, and xanthoma.

Magnetic resonance imaging has a high degree of accuracy in the identification, anatomic characterization, and evaluation of size and grade, which is useful in planning surgery.⁹ MRI of our patient showed Frond-like villus projections of the fat signal arising from the lower portion of the suprapatellar recess, in the popliteal fossa and the infrapatellar region. These characteristic features aid in diagnosing this condition.

In the early stages, analgesics and physiotherapy are helpful in pain management. Arthroscopic or open excision of involved synovium is the main course of treatment in later stages. Also, successful treatment by Yttrium-90 radio synovectomy has been reported.¹⁰ Our patient underwent diagnostic arthroscopy, which confirmed the diagnosis, open synovectomy was done, and the entire involved tissue was excised.

Histopathological examination showed synovial hyperplasia and hypertrophy, lobules of mature adipocytes replacing a significant portion of subsynovial tissue, and diffuse inflammatory infiltrates with activated lymphoid follicles. Finding activated lymphoid follicles is very unusual and has not been reported. The possibility of a chronic inflammatory condition like rheumatoid arthritis was suspected but the RA factor was negative. However, the possibility of seronegative rheumatoid arthritis cannot be ruled out.

CONCLUSION

LA is an extremely uncommon entity; proper diagnosis entails the correlating clinical presentation, radiological profile, and histopathological appearance. This is imperative not only to exclude other conditions of common knee pain but also for choosing an appropriate therapeutic regime. An early synovectomy is a valuable option.

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