

CASE REPORT

Lipoma Arborescens of the Knee: A Case Report of Rare Entity

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ABSTRACT

Lipoma arborescens is a non-neoplastic, reactive condition due to chronic synovial inflammation and irritation, characterized by frond-like or villous proliferation of mature adipose tissue covered by hyperplastic synovium. The knee is the most commonly affected site particularly the suprapatellar pouch. We report a case of lipoma arborescens affecting the right knee of an elderly Chinese gentleman associated with bilateral knee and hand osteoarthritis. He presented with progressive worsening of right knee swelling and pain. Partial synovectomy of the right knee was performed and no lesion recurrence was noted at one year post-operation. The clinical and imaging findings, pathological features, together with differential diagnoses were discussed.

Keywords: Knee, Lipoma arborescens, Lipomatous lesions

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INTRODUCTION

Lipoma arborescens is a rare intra-articular lesion affecting synovial linings of the joints and bursae with frond-like or villous depositions of fatty tissue. They account for less than 1% of all lipomatous lesions. Even though typically involves monoarticular joints such as knee, ankle, hip, shoulder, and elbow, polyarticular involvement is also seen (1). Patients typically present in their fifth to seventh decades of life with painless joint swelling, which frequently associated with effusion. There is no gender predilection identified. Magnetic resonance imaging (MRI) finding which shows synovial villous architecture with associated fatty signal (isointensity with fat) and joint effusion is considered by some authors as pathognomonic for lipoma arborescens (2). Synovectomy is the recommended treatment (1).

CASE REPORT

A 71-year-old Chinese male with bilateral knee and hand osteoarthritis, presented with right knee swelling for three weeks duration. The swelling was gradually increasing in size and associated with pain. However, there was no history of trauma, fever or constitutional

symptoms. He was on glucosamine sulphate for the osteoarthritis.

Initially, the patient was planned for right knee MRI. However, a contrast-enhanced computed tomography (CECT) scan of his right knee was performed instead as he has claustrophobia. CECT scan showed large intra-articular soft tissue mass (Fig. 1a) with multiple fat lobules seen within the mass (Fig. 1b). In view of a benign lesion from the CECT findings, open synovectomy was performed. Intra-operatively, the patella and anterior cortex of distal femur was thinned out, with no evidence of bony destruction. Severe osteoarthritic changes of the knee joint was noted with intra-articular loose bodies, multiple osteophytes and joint subluxation. Partial resection of the right knee synovium was done.

Macroscopically, the resected synovial tissue showed many yellowish fatty villous projections (Fig. 2a). The cut sections showed lobules of fatty tissue separated by thin to thick whitish fibrous septae (Fig. 2b). Diffuse and small foci of stromal haemorrhages were also seen. No obvious necrosis was noted.

Microscopic examination of the lesion using haematoxylin and eosin (H&E) stain showed broad papillary fronds of hyperplastic synovial tissue (Fig. 3). The papillary fronds were lined by more than two layers of synovial epithelium. The subepithelial stroma was mildly infiltrated by lymphoplasmic cells. There were many lobules of mature adipose tissue in the deeper



Fig. 1: CECT scan showed large intra-articular soft tissue mass (Fig 1a) with multiple fat lobules within the mass (Fig 1b).

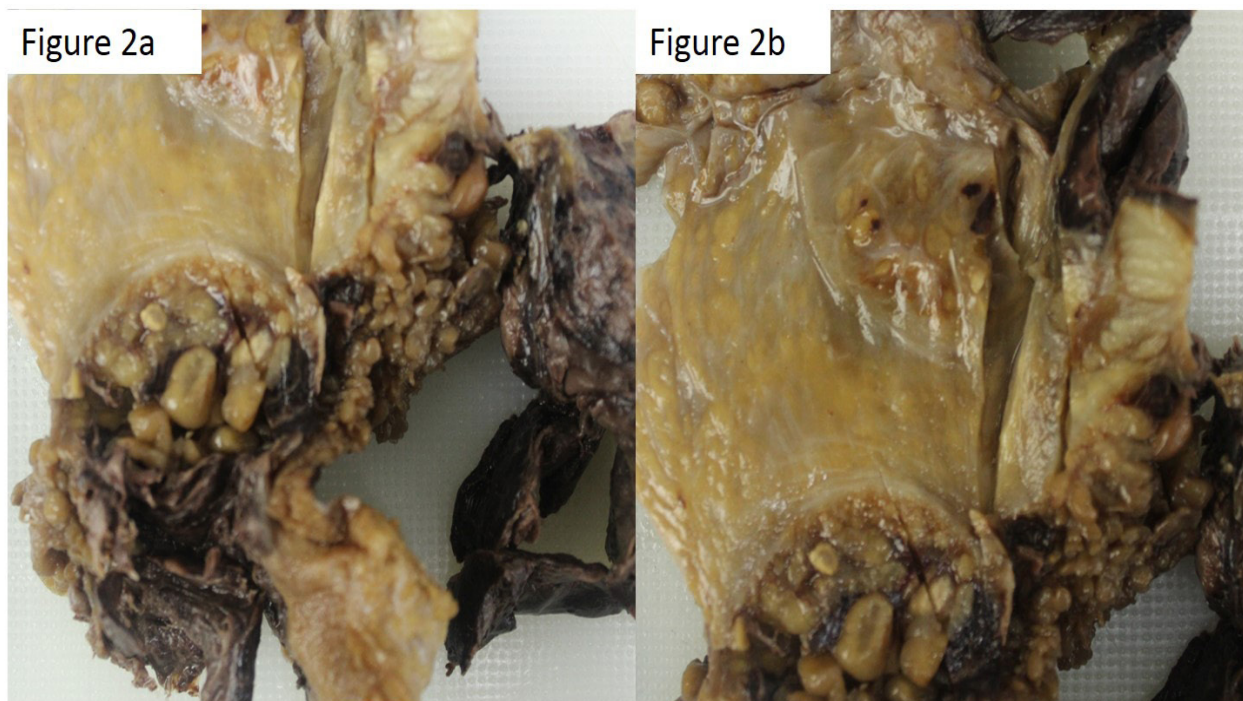


Fig. 2: Macroscopically, the synovial tissue showed yellowish fatty villous projection (Fig 2a). The cut sections showed lobules of fatty tissue separated by whitish fibrous septae (Fig 2b).

part of the stroma, separated by loose fibrocollagenous tissue (Fig. 4). Prominent capillary and medium sized blood vessel network was present. Old and new stromal haemorrhages were evidenced, with presence of haemosiderin-pigments. There was no lipoblasts or atypical stromal cells seen. Diagnosis of lipoma arborescens was made.

Post-synovectomy rehabilitation with active exercises was carried out to preserve the range of movement. Physiotherapy was continued for his bilateral knee osteoarthritis. No tumour recurrence was noted at one year of post-operation.

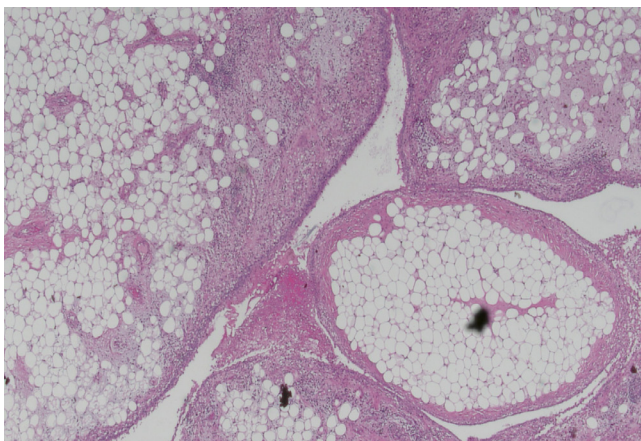


Fig. 3: Broad papillary fronds of synovial tissue lined by hyperplastic synovial epithelium. Mature adipose tissue in seen in the stroma (Hematoxylin and eosin stain, original magnification x 100).

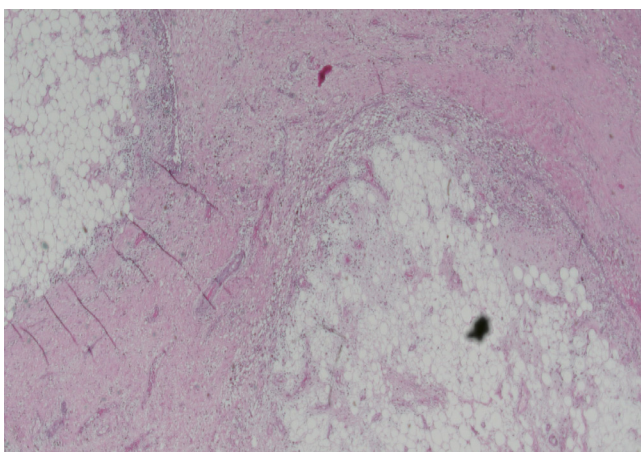


Fig. 4: The lobules of adipose tissue were separated by loose fibrocollagenous tissue accompanied by mild chronic inflammation (Hematoxylin and eosin stain, original magnification x 100).

DISCUSSION

Lipoma arborescens, also called villous lipomatous proliferation of synovial membrane, is a rare frond-like or villous deposition of benign fatty tissue in the synovial lining of large joints. It is characterized by diffused replacement of subsynovial tissue by mature fat cells. Arbor is a Latin word for tree, which describes the gross tree-like morphology of the villous synovial proliferation (3).

There are two types of lipoma arborescens. The primary lipoma arborescens is less common, occurs in younger age group and not associated with degenerative joint diseases. The possible etiological factor for this group is due to associated hereditary conditions. Dong et al. described a 22-year-old male with X-linked hyperimmunoglobulin M syndrome complicated with lipoma arborescens of bilateral knee joints (4). The secondary lipoma arborescens is more common, occurs in older age group and associated with degenerative joint diseases such as chronic synovitis, arthritis, trauma, meniscal injuries and inflammatory joint diseases. It is proposed that chronic joint inflammation and irritation resulted from repeated trauma is the triggering factor that leads to proliferation of subsynovial fat cells (5).

Clinical and pathological differential diagnoses that need to be considered include pigmented villo nodular synovitis (PVNS), synovial osteochondromatosis, rheumatoid arthritis, synovial lipoma, and gouty arthropathy. PVNS also shows villo nodular hyperplasia of synovium, but it usually occurs in young adults. The presence of neoplastic mononuclear cells and Touton multinucleated giant cells favour the diagnosis of PVNS. Lipoma arborescens with osseous metaplasia may mimic synovial osteochondromatosis. However, the latter does not have adipose tissue component. Rheumatoid arthritis, even though primarily a disease of the synovium with hyperplasia and inflammatory components, lacks proliferation of adipocytes. Synovial lipoma grossly shows a solitary, round to oval yellow lesion without the frond-like or villous depositions. Microscopically, it shows mature adipocytes without villous synovial proliferation or hyperplasia (5). Radiological findings such as juxta-articular bony erosions and calcification, together with crystals in the joint aspirate, favours gouty arthropathy rather than lipoma arborescens.

CONCLUSIONS

Secondary lipoma arborescens is a reactive process of the joint, commonly involving unilateral knee due to underlying degenerative joint diseases, for example osteoarthritis. Although it is rare with less than 70 cases published in the English language medical literature,

this entity should be in mind as a differential diagnosis in cases with swelling of large joints, particularly knee joints that associated with osteoarthritis or other degenerative joint diseases.

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