



## Lipoma Arborescens of the Knee – A Case Report

Authors

**Vijay Kumar Maddhala<sup>1\*</sup>, Alekhya Kunche<sup>2</sup>**

<sup>1,2</sup>Junior Resident, Department of Orthopaedics Andhra Medical College Visakhapatnam

\*Corresponding Author

**Dr Vijay Kumar Maddhala**

Junior Resident, Department of Orthopaedics, King George Hospital, Andhra Medical College, Visakhapatnam, India

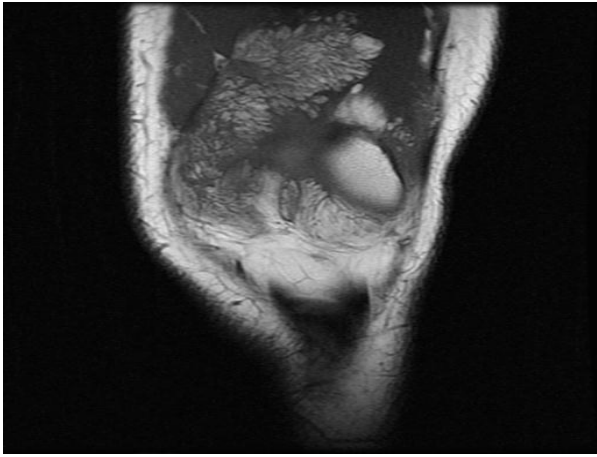
### Introduction

Lipoma arborescens, a benign neoplasm of the synovium which is very rare and characterized by lipomatous proliferation of the synovium with villous and polypoid appearance. 'Arborescens' is the word originated from the Latin word arbor (tree) and thus the tree like morphology of the tumor is described. Knee is the usual site of the tumor and the sub synovial layer is filled with fat cells. As lipoma arborescens is a very rare case which is found incidentally and thus this case is being presented.

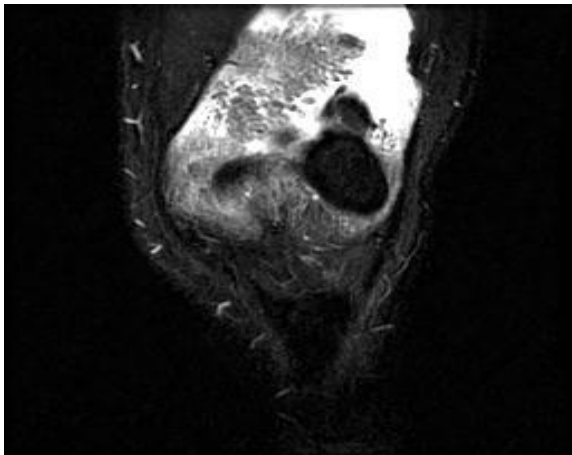
### Case Report

A 24 year-old male patient presented to orthopaedic OPD with complaint of left knee swelling and occasional pain since six months. He had no history of limping or locking knee, or giving way. There were no constitutional symptoms. On physical examination, soft boggy swelling with effusion in the supra patellar area was noted. There was no local rise of temperature or tenderness. Joint movements mainly flexion was restricted and painful. Laboratory test results which included complete blood cell count (CBC), erythrocyte sedimentation rate (ESR), C-reactive

protein (CRP), rheumatoid factor and uric acid were normal. Only minimal amount of joint fluid aspirated which was negative for gram stain, culture and crystals. Plain radiographs of the left knee joint were normal. Magnetic resonance imaging (MRI) showed a characteristic appearances of multiple villous lipomatous synovial proliferations and frond like synovial proliferation of fat signal intensity and reported as lipoma arborescens (**Fig.1a, 1b &1c**). Patient underwent open synovectomy and specimen sent for histopathological examination. Intra operatively we noted large villous and tree like synovial proliferations in supra patellar pouch (**Fig.2**). Microscopic examination revealed diffuse villous hypertrophy and hyperplasia of the synovium. Extensive mature adipose tissue admixed with focal and patchy chronic inflammatory cells and vascular proliferations were seen under the synovial lining (**Fig.3a & 3b**). Post operatively patient underwent physiotherapy for knee range of movements and attained near normal range. At the six months post-op follow up patient was asymptomatic with no evidence of recurrence.



**Fig 1 A**

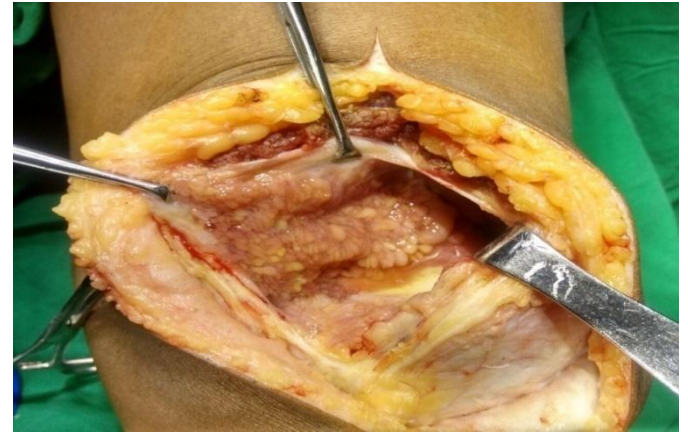


**Fig 1 B**

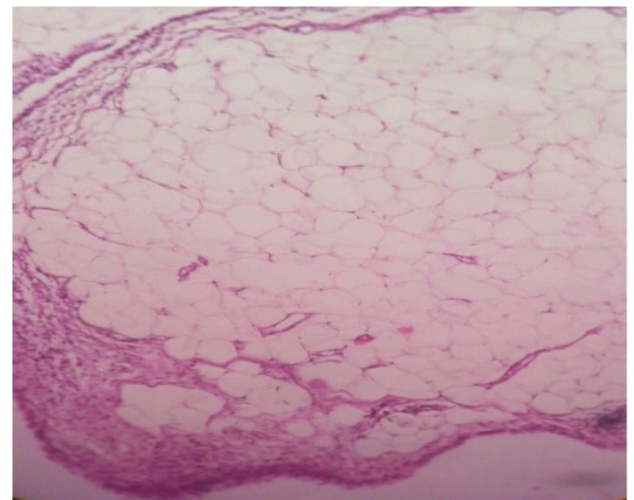


**Fig 1 C**

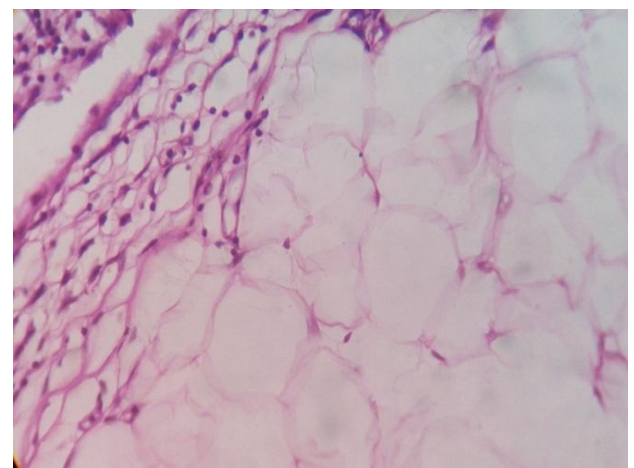
MRI showed a characteristic appearances of multiple villous lipomatous, synovial proliferations and frond like synovial proliferation on fat suppressed or STIR sequences and reported as lipoma arborescens (Fig.1A,1B &1C)..



**Fig. 2** Showing large villous and tree like synovial proliferations in supra patellar pouch.



**Fig. 3A** Microscopic examination of diffuse villous hypertrophy and hyperplasia of the synovium



**Fig.3B**

Extensive mature adipose tissue admixed with focal and patchy chronic inflammatory cells and vascular proliferations were seen under the synovial lining.

## Discussion

The lipomatous proliferation of the synovium with villous and polypoid appearance where the sub synovial layer is filled with mature fat cells is the characteristic feature of the Lipoma Arborescens (LA). It is a rare intra-articular benign tumor of synovium. The first mention of this Hoffa in 1904 was the earlier one to describe this tumorous condition. Arzimanogluz presented the first case report in 1957. **Hallel et al.**, in 1988 (5 cases) done a largest case series study<sup>1</sup>. **Kloen et al.** have reported the youngest LA in 9 years old patient and the oldest one 68 years old<sup>2</sup>.

The lipoma arborescens is idiopathic in origin though there is an association with degenerative joint disease. With the earlier studies there are 2 types of lipoma arborescens described: primary and secondary. The primary type is seen rarely and is related as a cause of degeneration of the knee joint. The secondary type is associated with chronic irritation and is described as lipomatosis. due to reactive process of the synovium secondary to chronic irritation, as is seen with trauma, meniscal injuries, chronic synovitis or arthritis, rather than a true neoplasm. This type is more common than the primary.

LA is usually monoarticular and commonly affects the supra patellar bursa of the knee. However, the other joints like the hip, shoulder, ankle and wrist involvement has also been reported. Bilateral presentation of this disease has been reported by Liddle A et al<sup>3</sup>. The affected patients usually present with a long-standing, slowly progressive painless swelling of a joint, especially the knee with intermittent effusion with restricted range of motion .

In this report our patient had left knee joint swelling of long duration and restricted joint movements. Pigmented villonodular synovitis, synovial lipoma, Hoffa disease, synovial hemangiomatosis, synovial chondromatosis and chronic inflammatory synovial proliferation like in rheumatoid arthritis were differential diagnosis for this condition., Synovial haemangioma and synovial lipoma were found in the infrapatellar fat

pad where as Lipoma arborescens usually arises in the suprapatellar pouch . Laboratory findings were usually unremarkable with normal leucocyte count and ESR. Joint fluid was negative for crystals and bacteria. Plain radiographs showed degenerative changes, such as joint space narrowing, osteophytes, and subchondral cystic changes. CT scanning showed low signal intensity for villonodular intraarticular masses. Knee arthrograms have shown multiple, grape-like lobular intra articular filling defects. For diagnosis and to differentiate lipoma arborescens from other lesions MRI is taken as the gold standard method. Characteristic appearances of multiple villous lipomatous synovial proliferations and frond like synovial proliferation were assessed on MRI on fat suppressed or STIR sequences.

**Fig.1A, 1B & 1C:** MRI showing frond like synovial proliferation of fat signal intensity with multiple villous lipomatous synovial proliferations.

MR imaging findings in LA like joint effusion (100%), erosive bone changes at articular margins (38%), associated synovial cysts (25%), and degenerative changes with meniscal tears were reported by **Ryu et al.** In their study<sup>4</sup>. **Soler et al.** reported the MR imaging relating the duration of this disease showing a variety of morphological appearances. The durations of symptoms were relatively short in multiple villous lipomatous synovial proliferation (1–7 months), while 1–20 years in mixed pattern and 6–7 years in isolated frond-like subsynovial fat mass<sup>5</sup>. Pigmented villonodular synovitis due to haemosiderin deposition produces a diffuse low-intensity signal on T1- and T2-weighted sequences. Synovial chondromatosis shows variable intensity signals according to the cartilaginous nature of the lesion. The microscopic and macroscopic appearances had differentiated the lipoma arborescens and intra-articular lipoma. Intra-articular lipoma lacks the villous frond-like appearance as seen in lipoma arborescens. Lipoma arborescens microscopically revealed a diffuse replacement of the subsynovial layer by mature fat cells with a

moderate infiltration of mononuclear inflammatory cells. However intra-articular lipoma, covered by synovium does not arise from or replace the subsynovial layer.

**Fig 3A & 3B.** Showing diffuse villous hypertrophy and hyperplasia of the synovium. Extensive mature adipose tissue admixed with focal and patchy chronic inflammatory cells and vascular proliferations were seen under the synovial lining.

The treatment for LA is synovectomy which may be open synovectomy and/ or arthroscopic synovectomy or Radio Synovectomy (radio synoviorthesis) or chemical synovectomy with osmic acid. Synovectomy by radioisotopes was first tried in the 1950s. Delbarre introduced the term synoviorthesis (Synoviorthesis literally means restoration of the synovium) for this treatment in 1968. Yttrium-90 (Y-90) became preferentially used in the 1970s because of improved  $\beta$  radiation.

The selection criteria of the radio pharmaceutical agent depends on the joint size, for which beta particle range of the applied isotope is taken into consideration. The radiopharmaceutical agent used for radio synovectomy of knee joints is Y-90 silicate/ citrate colloid. Re-186 sulphide colloid is used for medium- sized joints (such as elbow). For small-sized joints (such as digital joints) the agent of choice is Er-169 sulphide colloid. Radiation necrosis of the injection canal or the adjacent soft tissue is a rare side effect of radio synovectomy.

Only the less extensive cases of LA of the knee could be treated with an arthroscopic anterior synovectomy because the lesion is accessible through standard arthroscopic portals, provided a complete excision of the lesion can be performed with advantage of early rehabilitation.

In our patient we did open synovectomy and confirmed our diagnosis by histopathology. His knee pain was reduced immediately postoperatively and achieved near normal range of motion from 110 degree of flexion to full

extension. Peter Kloen et al did open synovectomy in four cases<sup>2</sup>. Postoperative period was uneventful.

### Conclusion

In conclusion Lipoma arborescens is a rare, benign intra articular tumour which may mimic a number of other diagnoses. In cases of unexplained chronic joint effusion, MRI should be considered to exclude this pathology as well as other uncommon intra articular pathology.

Treatment with synovectomy is frequently curative.

### References

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