Reminder of important clinical lesson

Baked beans in the knee? An odd-looking synovial swelling in the knee joint

Bhushan M Sabnis,¹ David Barrett²¹Department of Orthopaedics, Southampton General Hospital, Southampton, Hampshire, UK²Department of Orthopaedics, University Hospitals of Southampton, Southampton, Hampshire, UK

Correspondence to Bhushan Madhav Sabnis, bhushanmsabnis@gmail.com

Summary

Lipoma arborescens (LA) is a rare benign neoplasm affecting large synovial joints, most commonly seen in the knee joint. Unlike other common swellings around the knee joint, LA is intra-articular and can lead to degenerative changes in the knee joint due to mechanical impingement. The importance of correct diagnosis with characteristic MR and macroscopic appearance and appropriate surgical treatment is outlined in this case report.

BACKGROUND

Most soft tissue benign tumours/lesions around the knee such as lipomas, ganglia and bursal swellings have no long-term detrimental effect on the knee joint. They can be initially managed conservatively. Unlike these, lipoma arborescens (LA) is an intra-articular structure and may lead to degenerative changes in the knee joint through mechanical impingement. LA is caused by proliferation of adipose tissue cells in subsynovium leading to villous proliferation. It has been known to be associated with trauma, inflammatory conditions and also osteoarthritis. The treatment involves synovectomy and is usually curative. For a large mass, arthroscopic-assisted open excision of the lesion is an effective treatment.

CASE PRESENTATION

A 47-year-old fit and active man presented with a chronic swelling in the right knee. There was no history of trauma and similar swellings in any other joints. He also complained of episodes of recurrent effusions that were activity related. He gave history of previous arthroscopy and partial medial meniscectomy about 10 years back.

Clinical examination revealed significant fullness in the suprapatellar pouch with a large effusion in the knee joint (figure 1). The swelling was non-tender and soft to touch. Knee range of motion was from 0° to 90°. Further flexion was restricted due to pain. Clinical tests for knee stability were comparable with the other side and McMurray's test for meniscal tear was negative. A moderate Baker's cyst was present in the popliteal fossa. No neurovascular deficit was noted.

INVESTIGATIONS

Plain radiograph revealed large effusion in the suprapatellar pouch. No bony erosions were noted. Early osteoarthritic changes were noted in the medial compartment.

Blood tests did not reveal any inflammatory pathology.

MRI scan of the knee demonstrated a large mass in the suprapatellar pouch. It showed classical tree-like appearance of adipose tissue with large effusion in the knee

joint (figure 2). The mass was bright on both T1-weighted and T2-weighted images and dark on short tau inversion recovery (STIR) or fat-suppressed imaging.

He underwent arthroscopic-assisted open synovectomy. Intraoperative photographs show a 'baked beans in the knee' appearance of the lesion due to lipomatous hypertrophied villous synovium (figure 3).

Histology of the lesion confirmed the diagnosis of LA. It showed subsynovial infiltration of mature adipose cells with intervening fibrovascular septae. Mild lymphoplasmocytic infiltrate was also seen in the synovium.

DIFFERENTIAL DIAGNOSIS

Intra-articular lesions in the knee such as pigmented villous nodular synovitis (PVNS) and chronic inflammatory

Figure 1 Axial section T2-weighted MRI, large effusion with a villous mass in the suprapatellar pouch.

Figure 2 Coronal T1-weighted image—tree-like configuration of the mass.

synovitis are essential to be differentiated from LA. This is based on a bloody aspirate and classical picture of PVNS during arthroscopy and MR appearance. Other lesions such as synovial chondromatosis are associated with multiple loose bodies that may be visible on radiographs or MRI scan and sometimes may be clinically palpable. Synovial haemangioma and true intra-articular lipoma are relatively rare and are diagnosed mainly by their classical MR appearance.

TREATMENT

He underwent arthroscopy-assisted open synovectomy to excise the mass in toto (figure 4).

Figure 3 Intraoperative photograph—'baked beans in knee' appearance.

Figure 4 Lipoma arborescens excised in toto.

OUTCOME AND FOLLOW-UP

Recovery was uneventful and at 3 months postoperation the patient has minimal knee effusion, a full range of motion and has attained his normal life as a roofer.

DISCUSSION

LA is a rare benign lesion seen in synovial joints. It is caused by substitution of the subsynovial layer by mature adipose tissue cells that cause a villous hypertrophy of the synovium giving a classical tree-like appearance.¹⁻³

The aetiology of LA remains unclear. Its association with degenerative joint disease and trauma is known but whether it is caused by these is not known. Previously, developmental, traumatic, inflammatory and neoplastic origins have been postulated.⁴ Hallel *et al*² have suggested using the term villous lipomatous proliferation of the synovium since lipoma in LA indicates a tumorous terminology.

It is believed that two types exist. Primary LA is rare and is a cause of degenerative joint disease. Secondary LA is more due to chronic irritation, is more common and may be associated with trauma, meniscal injuries, inflammation and osteoarthritis.⁵

Various authors have described LA as a single case report or a small case series. Usually unilateral; bilateral and poly-articular involvement has also been reported. Most commonly affecting the knee joint, cases affecting the ankle, wrist, hip and elbow have also been described.³⁻⁸

Common presentation of a chronic swelling in the knee with cyclic recurrence of effusions related to activity in patients in the fourth decade of age remains. The knee effusions are believed to be associated with entrapment of the villous structure in the joint leading to irritation and mechanical symptoms.⁵

MRI findings of LA are believed to be pathognomonic for the lesion and help to differentiate LA and other causes of chronic knee swelling such as PVNS, chronic inflammatory synovitis, synovial chondromatosis, synovial haemangioma and true synovial lipoma.^{3 5 8 9} Three distinct patterns of LA have been observed on MRI; most common is the diffuse villous proliferation, others being a discrete mass lesion and a mixed pattern.³

Arthroscopic appearance of yellow-brown villi in the suprapatellar pouch, macroscopic appearance of the lesion

(baked beans in the knee joint), histology showing mature adipose tissue cells in the subsynovial layer with a mild inflammatory reaction in the synovium help in confirming the diagnosis.

Soft tissue masses around the knee joint should always be investigated. Unlike the more common lipoma/bursal swellings, LA is an intra-articular lesion. It is associated with entrapment of mass in the mechanism of the knee joint that can cause recurrent mechanical symptoms and may as a result, precipitate degenerative changes to the joint. Its diagnosis and resolution with synovectomy is important in preventing this.

Treatment of LA is synovectomy and is usually curative. In all previous papers, no recurrence has been reported even at long term,² except for a case in a child of 9 years.¹⁰ Open synovectomy is usually the treatment of choice. Recently, arthroscopic excision has been reported to achieve favourable outcome in a relatively smaller lesion.^{4 11} However, for a sizeable lesion such as in our case, we feel arthroscopic excision alone would not suffice and hence recommend arthroscopic-assisted open excision of the lesion.

Intra-articular synovial lesions can be difficult to diagnose but we feel it is important to consider LA in differential diagnosis. It is easy to identify LA with MRI in patients with chronic knee effusions and it is usually treatable with synovectomy.

Learning points

- ▶ Chronic knee effusion and swelling need to be investigated, especially those with recurrent mechanical symptoms.
- ▶ Lipoma arborescens is an unusual intra-articular benign lesion affecting the knee joint that can precipitate degenerative changes in the joint.
- ▶ Classical tree-like appearance of the fatty mass on MRI clinches the diagnosis.
- ▶ Synovectomy is usually curative.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. **Kloen P**, Keel SB, Chandler HP, *et al.* Lipoma arborescens of the knee. *J Bone Joint Surg Br* 1998;**80**:298–301.
2. **Halle T**, Lew S, Bansal M. Villous lipomatous proliferation of the synovial membrane (lipoma arborescens). *J Bone Joint Surg* 1988;**70-A**:264–70.
3. **Vilanova JC**, Barcelo J, Villalon M, *et al.* MR imaging of lipoma arborescens and the associated lesions. *Skeletal Radiol* 2003;**32**:504–9.
4. **Sola JB**, Wright RW. Arthroscopic treatment for lipoma arborescens of the knee joint. A case report. *J Bone Joint Surg* 1998;**80-A**:99–103.
5. **Yan CH**, Wong JW, Yip DK. Bilateral knee lipoma arborescens: a case report. *J Orthop Surg (Hong Kong)* 2008;**16**:107–10.
6. **Davies AP**, Blewitt N. Lipoma arborescens of the knee. *Knee* 2005;**12**:394–6.
7. **Silva L**, Terroso G, Sampaio L, *et al.* Polyarticular lipoma arborescens—a clinical and aesthetical case. *Rheumatol Int.* Published Online First: 28 April 2011. doi: 10.1007/s00296-011-1941-8.
8. **Coll JP**, Ragsdale BD, Chow B, *et al.* Lipoma arborescens of the knees in a patient with rheumatoid arthritis. *Radiographics* 2011;**31**:333–7.
9. **Feller JF**, Rishi M, Hughes EC. Lipoma arborescens of the knee: MR demonstration. *Am J Radiol* 1994;**163**:162–4.
10. **Donnelly LF**, Bisset GS III, Passo MH. MRI findings of lipoma arborescens of the knee in a child: case Report. *Pediat Radiol* 1994;**24**:258–9.
11. **Franco M**, Puch JM, Carayon MJ, *et al.* Lipoma arborescens of the knee: report of a case managed by arthroscopic synovectomy. *Joint Bone Spine* 2004;**71**:73–5.

Copyright 2012 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit

<http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Sabnis BM, Barrett D. Baked beans in the knee? An odd-looking synovial swelling in the knee joint. *BMJ Case Reports* 2012;10.1136/bcr-2012-007399, Published XXX

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow