Imaging of the solid form of lipoma arborescens of the knee

Published on 31.01.2010

DOI: 10.1594/EURORAD/CASE.8088
ISSN: 1563-4086
Section: Musculoskeletal system
Case Type: Clinical Cases

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Patient: 30 years, male

Clinical History:

A 30-year-old man was investigated for a painful right swollen knee. Imaging investigations included ultrasound and MRI of the knee. Diagnosis was confirmed at arthroscopy of the knee. The differential diagnoses for unusual swellings of the knee are explored along with some imaging features.

Imaging Findings:

A 30-year-old man presented with a history of right knee pain and swelling. There was no history of trauma or connective tissue disease.

Initial assessment by ultrasound showed a diffuse solid echogenic mass in the supra-patella pouch, which extended into both sides of the joint with a small effusion. (Fig. 1) The mass had a normal vascular appearance and did not compress. No villous frondlike projections were seen. The patella and quadriceps tendon were normal.

Further investigation by MRI confirmed a diffuse fatty mass in the supra-patella pouch (Figs. 2 & 3). The joint cavity was expanded by the mass with a small effusion and minimal synovial thickening demonstrated. No joint erosions, marrow oedema, haemosiderin or calcification was evident on MRI. (Figs. 4, 5, 6, 7)

The lipoma arborescens was confirmed at arthroscopy (Fig. 8 & 9) and the patient subsequently underwent a synovectomy.

Discussion:

Lipoma arborescens is a rare condition that forms part of the differential diagnosis for non-infectious knee swelling. This includes synovial chondromatosis, pigmented villonodular synovitis (PVNS), synovial haemangioma and rheumatoid arthritis. The above were excluded because the patient had none of the typical features of these conditions mentioned below.

Synovial chondromatosis can show low / intermediate signal on T1 images in the synovium and joint space. T2 signal characteristics vary depending on the amount of calcification or ossification. PVNS shows low signal synovium associated with haemosiderin deposition. Synovial haemangiomas appear as intra/extra-articular lesions which are intermediate signal on T1 & T2 with fluid voids in abnormal vessels or calcified phleboliths. Rheumatoid arthritis shows low signal synovial tissue on T2 which can indicate fibrous pannus formation.

Lipoma arborescens has two different forms; the villous frondlike synovial mass has been described on ultrasound and MRI. The other form is a mass of subsynovial fat deposition that has been shown on MRI as a well-marginated single nodule on the supra-patella bursa, without irregularity or synovial hyperplasia [1, 2]. The usual ultrasound appearances of the villous form are of a hypechoic vascular frondlike mass. The projections have been shown to
move around inside an effusion during real time imaging with knee manipulation. [3, 4] The solid form of lipoma arborescens has rarely been shown using ultrasound before.

Lipoma arborescens has to be differentiated from synovial lipoma. The arborescens form often has a joint effusion, synovial cyst and joint erosions along with the subsynovial fat deposition. The synovial lipoma is a localized rounded / oval fatty mass without synovial changes. [1]

The original ultrasound suggested synovial lipoma because of the solid echogenic mass. The MRI confirmed a diffuse mass filling the joint cavity as shown on ultrasound. The arthroscopy and subsequent histology showed a solid mass fatty synovial proliferation, the solid form of lipoma arborescens. We feel that our readers should be aware of this unusual form.

**Differential Diagnosis List:** Solid form of lipoma arborescens.

**Final Diagnosis:** Solid form of lipoma arborescens.

**References:**


Figure 1

Description: Solid mass in supra-patella pouch on ultrasound. Origin:
Description: T1 sagittal demonstrates the solid supra-patella mass. Origin:
Description: T2 fat sat axial shows mass with small effusion. Origin:

Description: T2 fat sat axial shows the mass extending down towards the joint line. Origin:
Description: Solid mass occupying most of the joint cavity on the coronal image. Origin:
Description: No joint erosion, marrow oedema, calcification or haemosiderin present. Origin:
Figure 3

Description: Lipoma arborescens at arthroscopy. Origin:
Description: Lipoma arborescens at arthroscopy. Origin: