

LETTER TO THE EDITOR

Bilateral knee lipoma arborescence diagnosed by ultrasound

Dear Editor,

A 57-year-old Hispanic woman with no significant past medical history, presented to our clinic with a 5-year history of bilateral knee pain and swelling for which she had tried naproxen without much relief. Physical examination revealed a moderate effusion in the right supra-patellar region with a limited range of motion from 0° up to 100°. The left knee effusion was milder and range of motion was preserved. Laboratory tests demonstrated a normal leukocyte count, C-reactive protein and erythrocyte sedimentation rate. Furthermore, synovial fluid analysis was non-inflammatory without any crystals. Rheumatoid factor (RF) was 31 IU/mL (normal < 13.9) but anti-cyclic citrullinated protein (anti-CCP) was negative.

Radiographs of right knee demonstrated a moderate knee effusion without erosions. Radiographs of bilateral hands demonstrated joint space narrowing and osteophytes along both the first metacarpophalangeal joints consistent with osteoarthritis. Ultrasound of bilateral knees revealed a villous hyperechoic fatty proliferation with clear frond-like morphology inside the pouch, consistent with lipoma arborescens, more prominent in the right knee (Fig. 1). MRI of the right knee demonstrated suprapatellar joint effusion and frond-like projections of hypertrophied synovium (Fig. 2). Although positive for RF, the patient did not have any signs of active synovitis and hence was referred to orthopedic surgery for synovectomy.

Discrete intra-articular solid lipomas are very rare; the more common finding is lipoma arborescens which represents a diffuse fatty lesion of the joint.¹ A characteristic gross feature is an increased level of mature fat cells, which proliferate under the synovium, producing excess pressure on the synovial lining which leads to bulges which appear as multiple villi-like morphologies.² At the cellular level, there are sheets of mature adipocytes, which are mixed with vasculature and separated by fibrous septae.²

The main differential diagnosis to consider in this scenario is pigmented villonodular synovitis. On ultrasound, pigmented villonodular synovitis (PVNS)

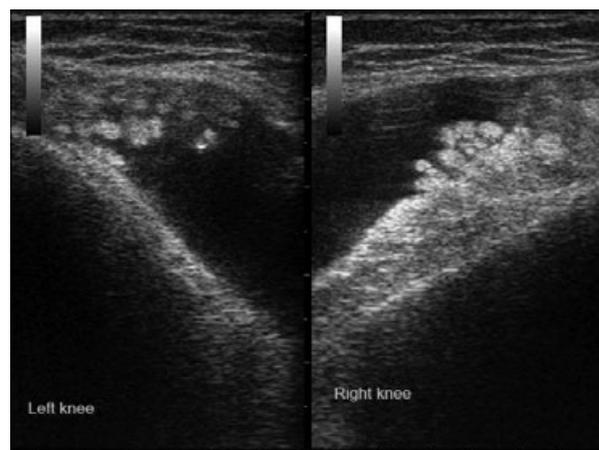


Figure 1 Longitudinal view, 7.5–12 MHz ultrasound image of both knees over suprapatella recess demonstrates a large effusion and villous hyper-echoic fatty synovial proliferation with clearly frond-like morphology inside the pouch.

presents as a well-delineated hypo-echoic mass inside the Hoffa fat pad (infra-patellar fat pad); in contrast lipomatosis arborescence presents as a hyperechoic frond-like lesion. On MRI PVNS exhibits low signal on both T1- and T2-weighted sequences due to hemosiderine deposits in the synovium.

These lesions manifest various clinical symptoms depending on location and extent of fat proliferation. However, chronic intermittent effusions, edema and limited range of motion in the affected joint are common manifestations.^{1,2} Although the most common location for this entity is in the suprapatellar region of the knee, there have been case reports of a multitude of other joints affected, such as wrists, hips, ankles, glenohumeral joints and tendon sheaths.^{2–5}

Although there have been multiple lipomatosis arborescens cases which are classified as secondary to an underlying pathology such as RA, DJD or trauma, there are also cases without any underlying reactive process.^{1,6} Hence, the underlying trigger for the proliferation of these fat cells under the synovial lining is yet to be elucidated. Radiographic features



Figure 2 Sagittal T2-weighted image with fat saturation of the knee demonstrates a large suprapatellar joint effusion. Frond-like projections of hypertrophied synovium extend into the high-signal joint fluid. The signal intensity of the frond-like projections is identical to the subcutaneous fat.

include a soft tissue mass within the synovium and occasionally along with degenerative findings.^{1,7} On MRI the villi formed by the synovial mass appear as frond-like structures and the signal intensity of the villi resembles fat.^{1,5,7} Characteristic sonographic findings demonstrate an effusion along with a hyper-echoic synovial mass with villi, which demonstrate wave-like motility upon compression via ultrasound probe.⁷

We believe this case is among the few unique cases of lipomatosis arborescens found to occur in a bilateral distribution. Furthermore, this is the first time that this entity has been diagnosed primarily via ultrasound and only confirmed by MRI as a secondary

imaging modality. When considering lipomatosis arborescens in the differential diagnosis, utilizing ultrasound as the first diagnostic imaging modality, is a quick, inexpensive and reliable method to make the diagnosis, given unique and characteristic sonographic features of this entity.

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