

Lipoma arborescens: An unusual cause of swelling of the knee

A. J. Spaans, MD; J. L. Turkenburg, MD; and R. Wagenmakers, MD, PhD

We report a patient with a lipoma arborescens in the knee, a chance finding discovered on MRI. This is an unusual cause of swelling of the knee joint; if this condition is present, it is almost always located in the suprapatellar pouch. In this case, the lipoma arborescens was found in the popliteal space.

Case report

A 71-year-old female patient presented at our outpatient orthopedic department because of pain and swelling at the medial and posterior aspect of the right knee. These complaints appeared after a long walk. On clinical examination, we found some diffuse swelling of the knee joint as well as a localized swelling in the popliteal space. Flexion measured 130 degrees, with 10 degrees of extension deficit. There was tenderness around the medial joint space, with a positive McMurray sign. Collateral and cruciate ligaments were stable. Conventional radiographs showed no abnormalities.

MRI of the right knee revealed a medial and lateral meniscal tear, a Baker's cyst in the popliteal space, and a focus of lipoma arborescens (Figs. 1-3). We advised the patient to undergo arthroscopy, but because of diminishing symptoms, this patient preferred to be treated expectantly.

Discussion

Lipoma arborescens is a rare, primary, benign tumor of the synovium of diarthrodial joints. It is characterized by villo-lipomatous proliferation of the synovium and diffuse replacement of the subsynovial tissue by mature fat cells (1, 2). It was first described by Arzimanoglu in 1957 (3). The

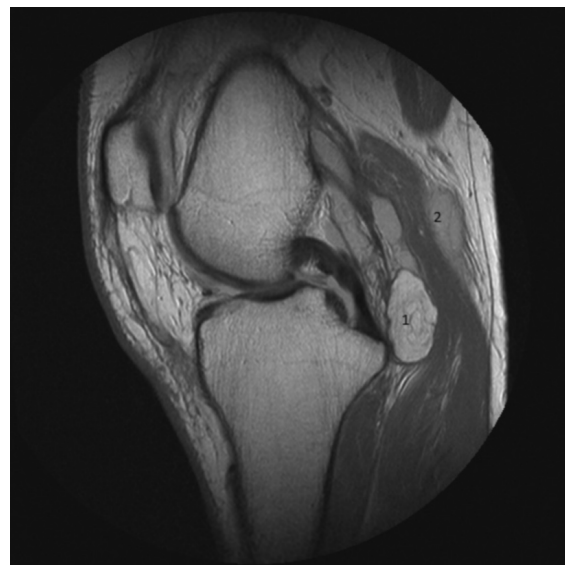


Figure 1. 71-year-old female with lipoma arborescens. Sagittal T1-weighted MRI of the right knee shows a focus of lipoma arborescens (1) of 26.9 mm length. A Baker's cyst (2) was also found in the popliteal space (2).

proliferating cells resemble a tree, which explains the name "arborescens," from the Latin word "arbor" (meaning tree) (4, 5).

Generally, one joint is affected, with the highest prevalence in the suprapatellar pouch of the knee joint (1, 2, 6, 7). Other joints that can be affected are the hip, shoulder, elbow, and ankle (8-12). The sex ratio is almost equal (4). The definite etiology of lipoma arborescens is unknown (1, 3), but the frequent occurrence of associated conditions (including local trauma, osteoarthritis, diabetes mellitus, and rheumatoid arthritis) suggests that this may be a reac-

Citation: Spaans AJ, Turkenburg JL, Wagenmakers R. Lipoma arborescens: An unusual cause of swelling of the knee. *Radiology Case Reports*. (Online) 2013;8:793.

Copyright: © 2012 The Authors. This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs 2.5 License, which permits reproduction and distribution, provided the original work is properly cited. Commercial use and derivative works are not permitted.

Drs. Spaans and Wagenmakers are in the Department of Orthopaedic Surgery, and Dr. Turkenburg is in the Department of Radiology, all at Amphia Hospital Breda, Breda, The Netherlands. Contact Dr. Spaans at annespaans@gmail.com.

Competing Interests: The authors have declared that no competing interests exist.

DOI: 10.2484/rcr.v8i1.793

Lipoma arborescens: An unusual cause of swelling of the knee

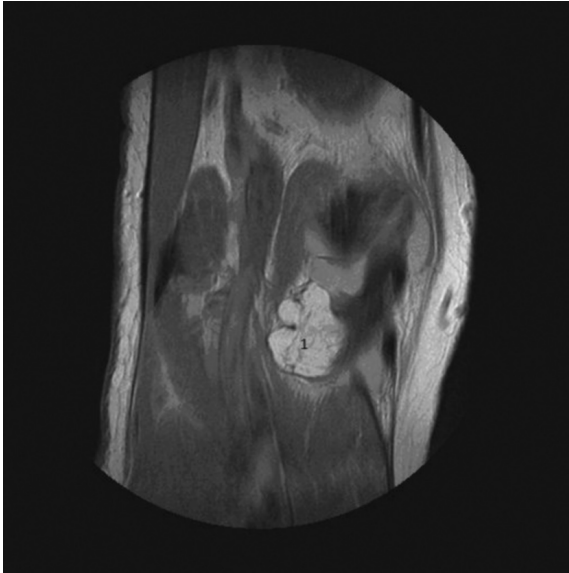


Figure 2. 71-year-old female with lipoma arborescens. Coronal T1-weighted MRI of the right knee shows a focus of lipoma arborescens (1).

tive disease (1, 4-6, 13, 14). Patients usually present with a longstanding, slowly progressive swelling of the involved joint and effusion. With increasing effusion, pain and restriction of the range of motion can develop (7, 15, 16). The condition can also present as a recurrent hemarthrosis in patients with knee osteoarthritis (17).

The differential diagnosis of synovial proliferative disorders should include pigmented villonodular synovitis, rheumatoid arthritis, synovial chondromatosis, synovial hemangioma, intra-articular lipoma, xanthomata, and lipoma arborescens (4, 7, 15, 16, 18, 19).

The diagnosis can be made by MRI, which can be considered to be the gold standard (4, 15, 20). Characteristic MRI findings include the following:

- A localized synovial mass with a frondlike architecture
- Fat-signal intensity on all pulse sequences
- Suppression of signal with fat-selective presaturation
- Associated joint effusion
- Potential chemical-shift artifact (a thin, low-intensity line that partially surrounds structures on MRI; this artifact is seen at the interface of tissues with different chemical shift properties, like water and fat, due to the phenomenon of chemical shift)
- Absence of magnetic susceptibility effects from hemosiderin (for differentiation from pigmented villonodular synovitis)

Treatment consists of synovectomy. Arthroscopic partial synovectomy can be performed for lipoma arborescens in the anterior compartment of the knee (14). In more extensive cases, a total synovectomy should be performed by ar-

throscopy (1, 7, 17, 21). The recurrence rate is low (1, 7, 14, 17, 21). No malignant degeneration has been described.

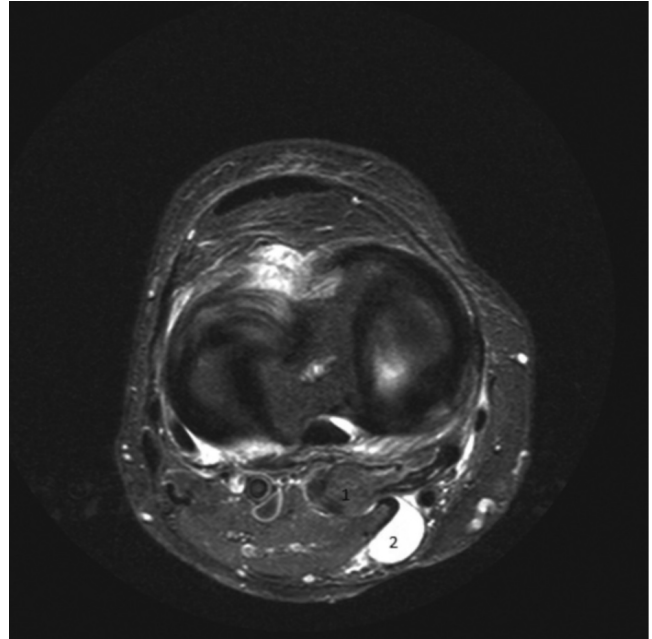


Figure 3. 71-year-old female with lipoma arborescens. Axial, T2-weighted, fat-suppressed MRI image of the right knee shows a focus of lipoma arborescens (1) and a Baker's cyst (2).

References

1. Hallel T, Lew S, Bansal M. Villous lipomatous proliferation of the synovial membrane (lipoma arborescens). *J Bone Joint Surg Am.* 1988; 70: 264-270. [PubMed]
2. Davies AP, Blewitt N. Lipoma arborescens of the knee. *The Knee* 2005; 12: 394– 396. [PubMed]
3. Arzimanoglu A. Bilateral Arborescent lipoma of the knee. *J Bone Joint Surg.* 1957; 39-A(4): 976-979. [PubMed]
4. Vilanova JC, Barceló J, Villalón M, Aldomà J, Delgado E, Zapater I. MR imaging of lipoma arborescens and the associated lesions. *Skeletal Radiol.* 2003; 32: 504– 509. [PubMed]
5. Patil PB, Kamalapur MG, Joshi SK, Dasar SK, Rao RV. Lipoma arborescens of knee joint: Role of imaging. *Radiology Case.* 2011 Nov; 5(11): 17-25. [PubMed]
6. Armstrong SJ, Watt I. Lipoma arborescens of the knee. *Br J Radiol.* 1989; 62(734): 178-180. [PubMed]
7. Kloen P, Keel SB, Chandler HP, Geiger RH, Zarins B, Rosenberg AE. Lipoma arborescens of the knee. *J Bone Joint Surg Br.* 1998; 80-B: 298-301. [PubMed]
8. Noel ER, Tebib JG, Dumontet C et al. Synovial lipoma arborescens of the hip. *Clin Rheumatol.* 1987; 6: 92–96. [PubMed]

Lipoma arborescens: An unusual cause of swelling of the knee

9. Levadoux M, Gadea J, Flandrin P, Carlos E, Aswad R, Panuel M. Lipoma arborescens of the elbow: a case report. *J Hand Surg.* 2000; 25: 580–584. [PubMed]
10. Siva C, Brasington R, Totty W, Sotelo A, Atkinson J. Synovial lipomatosis (lipoma arborescens) affecting multiple joints in a patient with congenital short bowel syndrome. *J Rheumatol.* 2002; 29: 1088-1092. [PubMed]
11. Huang GS, Lee HS, Hsu YC, Kao HW, Lee HH, Chen CY. Tenosynovial lipoma arborescens of the ankle in a child. *Skelet Radiol.* 2006; 35: 244–247. [PubMed]
12. In Y, Chun KA, Chang ED, Lee SM. Lipoma arborescens of the glenohumeral joint: a possible cause of osteoarthritis. *Knee Surg Sports Traumatol Arthrosc.* 2008; 16: 794–796. [PubMed]
13. Weitzman G. Lipoma arborescens of the knee. *J Bone Joint Surg Am.* 1965; 47: 1030-1033. [PubMed]
14. Franco M, Puch JM, Carayon MJ, Bortolotti D, Albano L, Lallemand A. Lipoma arborescens of the knee: report of a case managed by arthroscopic synovectomy. *Jt Bone Spine* 2004; 71: 73–75. [PubMed]
15. Grieten M, Buckwalter KA, Cardinal E, Rougraff B. Case report 873: lipoma arborescens (villous lipomatous proliferation of the synovial membrane). *Skeletal Radiol.* 1994; 23: 652–655. [PubMed]
16. Sailhan F, Hautefort P, Coulomb A, Mary P, Damsin JP. Bilateral lipoma arborescens of the knee. A Case report. *J Bone Joint Surg Am.* 2011; 93: 195-198. [PubMed]
17. Ji JH, Lee YS, Shafi M. Spontaneous recurrent hemarthrosis of the knee joint in elderly patients with osteoarthritis: an infrequent presentation of synovial lipoma arborescens. *Knee Surg Sports Traumatol Arthrosc.* 2010; 18: 1352–1355. [PubMed]
18. Coventry MB, Harrison EG, Martin JF. Benign synovial tumors of the knee: a diagnostic problem. *J Bone Joint Surg Am.* 1966; 48: 1350-1358. [PubMed]
19. Martinez D, Millner PA, Coral A, Newman RJ, Hardy GJ, Butt WP. Case report 745: synovial lipoma arborescens. *Skeletal Radiol.* 1992; 21: 393–395. [PubMed]
20. Feller JF, Rishi M, Hughes EC. Lipoma arborescens of the knee: MR demonstration. *Am J Roentgenol.* 1994; 163: 162-164. [PubMed]
21. Sola JB, Wright RM. Arthroscopic treatment for lipoma arborescens of the knee. *J Bone Joint Surg Am.* 1998; 80: 99–103. [PubMed]