

Lipoma Arborescens of the Elbow: A Case Report

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A 76-year-old woman with a longstanding history of right elbow swelling and recurrent joint effusion presented for consultation. There was no history of trauma and conventional radiographs were negative. Computed tomography (CT) and magnetic resonance imaging were performed and showed a frond-like fatty synovial mass and joint effusion. Arthrotomy disclosed a lipoma arborescens of the right elbow. (*J Hand Surg* 2000;25A:580–584. Copyright © 2000 by the American Society for Surgery of the Hand.)

Key words: Lipoma arborescens, elbow, surgery.

Lipoma arborescens is a rare benign lesion that exclusively affects synovial membranes. It was first described in the knee joint.^{1–4} There are no reports of lipoma arborescens in the elbow. Fewer than 25 cases of lipoma arborescens have been previously described in the literature and only 5 cases have been found in the upper limb.^{5–7} We present our first observed case in the elbow.

Case Report

A 76-year-old woman had been suffering from an anterior and lateral swelling in her right elbow for several months. She had a history of heart failure due to an atrial septal defect. She also had thyroid insufficiency and psoriatic arthritis localized primarily to the wrists and knees. She had no past history of trauma. Clinical examination revealed a full range of

elbow motion. Arthrocentesis of the elbow was attempted but no fluid was withdrawn. The white blood cell count, erythrocyte sedimentation rate, and plain radiographs were normal. Ultrasonography showed a multilobulated fatty mass very close to the joint. Computed tomography in the coronal plane showed a nonhomogeneous low-density intra-articular tumor suggesting a liposarcoma (Fig.1). Magnetic resonance imaging that included transverse and coronal T1-weighted (Fig. 2) and T2-weighted sequences were obtained. The images revealed a joint effusion containing a synovial-based soft tissue mass with numerous frond-like projections. On all pulse sequences the mass had a signal intensity similar to that of adjacent subcutaneous fat (Fig. 2). No magnetic susceptibility effects from hemosiderin were observed. The tumor surrounded the distal biceps tendon.

There was a heterogeneous enhancement after gadolinium administration, which was attributed to soft tissue inflammation (Fig.3). Liposarcoma and synovial sarcoma were proposed as diagnostic possibilities. The patient was referred to a surgeon for an open biopsy. An anterior “lazy s” approach was used. By blunt dissection, the distended capsule was approached and separated. Following incision of the capsule, a small amount of yellowish translucent fluid oozed out. The capsular wall was thick and its inner surface was covered with hypertrophic yellow-

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Figure 1. Computed tomography of the coronal plane of the right elbow shows an inhomogeneous low-density mass (large white arrow) with areas of near-fatty density (black arrow) separated by denser septa (small white arrow).

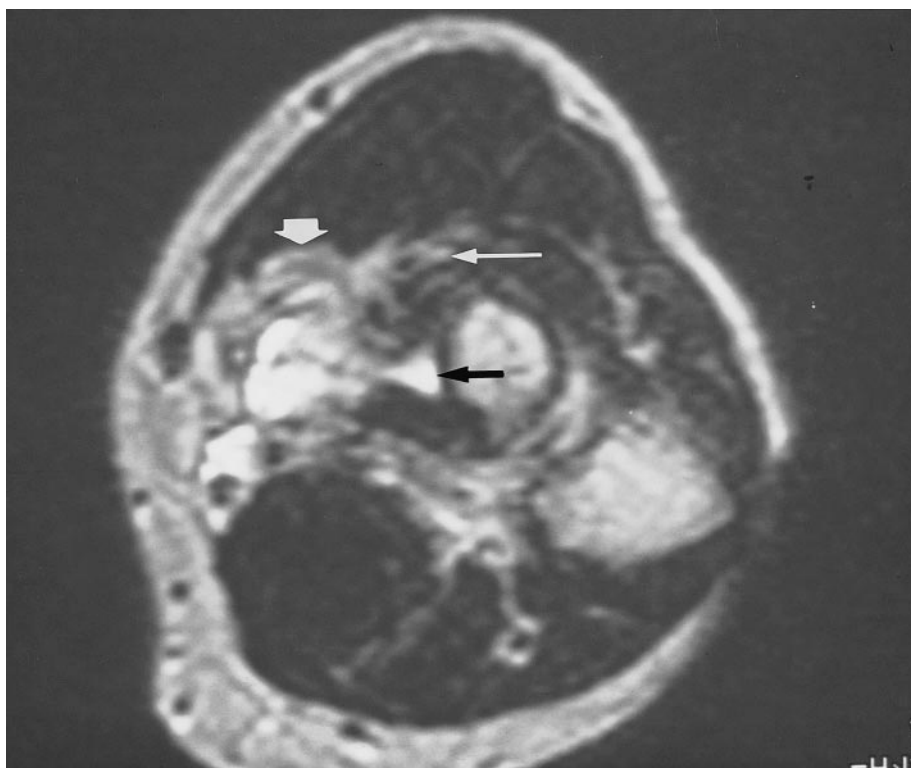


Figure 2. Magnetic resonance imaging on the coronal plane of the right elbow (T1-weighted) showing a synovial-based soft tissue mass (large white arrow) with numerous frond-like projections (small white arrow) in a joint effusion (black arrow).



Figure 3. Magnetic resonance imaging on the sagittal plane (T1-weighted) after gadolinium administration showing a heterogeneous contrast enhancement (large arrow) associated with soft tissue infiltration (small arrow).

ish villi. An incisional biopsy was performed. The complete excision was completed following return of the benign frozen section. The size of the fatty mass

was $3.4 \times 2.2 \times 1.4$ cm. Histologic examination showed extensive replacement of the subsynovial connective tissue by mature fatty cells and swollen

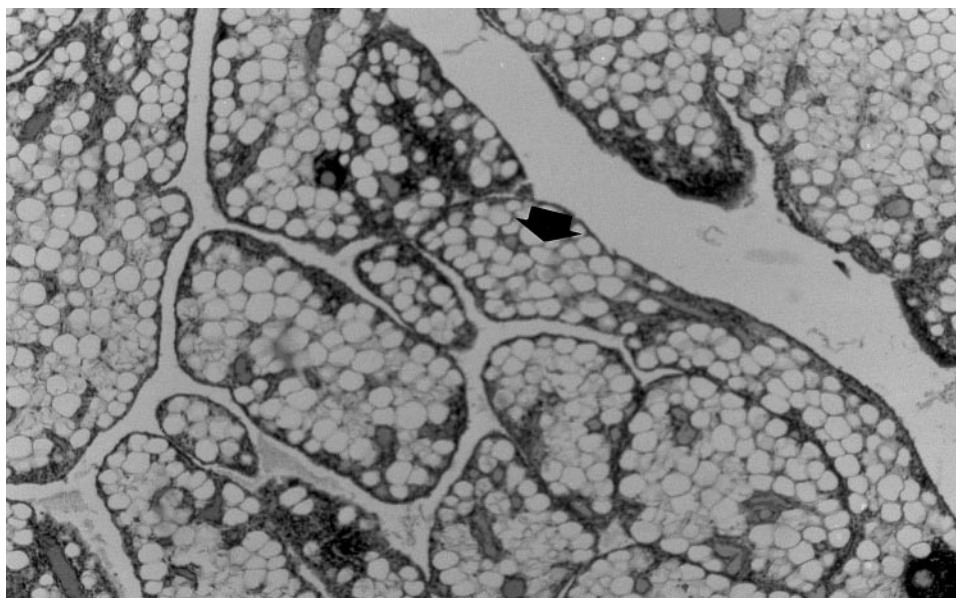


Figure 4. A histologic section of the surgical specimen showing villi formation with almost complete replacement of the synovial connective tissue by mature fat (arrow). (Hematoxylin-eosin stain; magnification $\times 50$.)

villous projections over the synovial surface (Fig. 4). The gross and microscopic appearances were consistent with lipoma arborescens. No recurrence was observed after a 4-year follow-up period. The patient continues to have full range of motion.

Discussion

Lipoma arborescens is a rare intra-articular lesion. This synovial disorder most commonly involves the knee joint and has a predilection for the suprapatellar pouch.⁸ Lipoma arborescens in other joints is rare. Only sporadic cases have been described in the literature.⁹ Almost 25 cases in both knee and other joints have been reported. Coventry et al¹⁰ observed only 1 lipoma arborescens in a series of 4,000 arthrotomies performed for synovial disorders during a 19-year period at the Mayo Clinic. Other locations in which lipoma arborescens occurs include the shoulder (3 cases^{6,7}), the hip (2 cases^{11,12}), the wrist (1 bilateral case¹³), and the ankle (1 case).

Lipoma arborescens is of unknown etiology. In some cases, lipoma arborescens is associated with trauma, chronic rheumatoid arthritis, or degenerative joint disease. Psoriatic arthritis has been associated with lipoma arborescens in 3 cases.^{14,15} Lipoma arborescens has been documented over a wide range of ages and is more commonly found in the men.⁹ Women have been affected, as have girls.¹⁶ Typically, patients present with painless joint swelling over many months or years.¹⁷ Pain may be present and range of motion may be restricted. Most of the time arthrocentesis fails, as in our case,¹⁵ because the lipoma arborescens blocks any free fluid from being withdrawn. Laboratory tests, including erythrocyte sedimentation rate and C-reactive protein, are usually normal. Serologic tests for rheumatoid factor must be performed and diabetes mellitus ruled out.¹⁸ All these tests were negative in our patient. Standard radiographs are usually normal, as in our case. Computed tomography is helpful because it shows the synovial origin of the lesion and the characteristic frond-like appearance.⁹ Furthermore, it shows the fatty origin of the tumor and differentiates lipoma arborescens from pigmented villonodular synovitis.^{4,9,19} Magnetic resonance imaging is the most valuable technique for examining patients with lipoma arborescens⁸ and findings are pathognomonic. A joint effusion surrounds villous lipomatous proliferation in 100% of patients. Mass-like subsynovial fat deposition-associated synovial cysts and degenerative changes are less common. We agree with most aspects of Ryu et al's⁸ description of this entity.

Villous lipomatous proliferation is isointense with the subcutaneous fat on all pulse sequencing. There is a joint effusion and an absence of magnetic susceptibility effects from hemosiderin, which rules out pigmented villonodular synovitis. Heterogeneous contrast enhancement after gadolinium diethylenetriamine pentaacetic acid administration was found; however, Ryu and al⁸ noted no contrast enhancement after gadolinium diethylenetriamine pentaacetic acid. Chaljub and Johnson²⁰ found joint fluid enhancement after gadolinium diethylenetriamine pentaacetic acid between the fatty villous synovial lesion. Insinuation of contrast-enhanced joint fluid within the interstices of the fatty villous projections can explain the heterogeneous enhancement that we noted and may explain why we missed the diagnosis.

The suggested treatment of lipoma arborescens is synovectomy, which successfully prevents tumor recurrence. Only 1 case recurred after synovectomy⁸; this case was treated with success by repeat synovectomy.

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References

1. Arzimanoglu A. Bilateral arborescent lipoma of the knee: a case report. *J Bone Joint Surg* 1957;39A:976-979.
2. Weitzman G. Lipoma arborescens of the knee: report of a case. *J Bone Joint Surg* 1965;47A:1030-1033.
3. Edamitsu S, Mizuta H, Kubota K, Matsukawa A, Takagi K. Lipoma arborescens with hemarthrosis of the knee: a case report. *Acta Orthop Scand* 1993;64:601-602.
4. Mestiri M, Kooli M, Charfi F, Ezzaouia K, Robbana A, Zlitni M. Le lipome arborescent du genou: apport de la tomodynamométrie: à propos d'un nouveau cas. *Rev Chir Orthop* 1996;82:340-343.
5. Napolitano A. Il lipoma arborescens della sinoviale. *Progresso Med* 1957;13:109-118.
6. Dawson JS, Dowling F, Preston BJ, Neumann L. Case report: lipoma arborescens of the sub-deltoid bursa. *Br J Radiol* 1995;68:197-199.
7. Laorr A, Peterfy CG, Tirman PFJ, Rabassa AE. Lipoma arborescens of the shoulder: magnetic resonance imaging findings. *Can Assoc Radiol J* 1995;46:311-313.
8. Ryu KN, Jaovisidha S, Schweitzer M, Motta AO, Resnick D. MR imaging of lipoma arborescens of the knee joint. *AJR Am J Roentgenol* 1996;167:1229-1232.
9. Armstrong SJ, Watt I. Lipoma arborescens of the knee. *Br J Radiol* 1989;62:178-180.
10. Coventry MB, Harrison EG, Martin JF. Benign synovial tumors of the knee: a diagnostic problem. *J Bone Joint Surg* 1966;48A:1350-1358.
11. Noel ER, Tebib JG, Dumontet C, et al. Synovial lipoma arborescens of the hip. *Clin Rheumatol* 1987;6:92-96.
12. Hubscher O, Constanza E, Elsner B. Chronic monoarthritis due to lipoma arborescens. *J Rheumatol* 1990;6:861-862 (letter).

13. Gäde EA. Ein Fall von Synovitis chronica villosa generalisata (lipoma arborescens). *Arch Orthop Unfall Chir* 1961;53:315–319.
14. Kloen P, Keel SB, Chandler HP, Geiger RH, Zarins B, Rosenberg AE. Lipoma arborescens of the knee. *J Bone Joint Surg* 1998;80B:298–301.
15. Roberts WN, Hayes CW, Breitbart SA, Owen DS Jr. Dry taps and what to do about them: a pictorial essay on failed arthrocentesis of the knee. *Am J Med* 1996;100:461–464.
16. Donnelly LF, Bisset GS III, Passo MH. MRI findings of lipoma arborescens of the knee in a child: case report. *Pediatr Radiol* 1994;24:258–259.
17. Hallel T, Lew S, Bansal M. Villous lipomatous proliferation of the synovial membrane (lipoma arborescens). *J Bone Joint Surg* 1988;70A:264–270.
18. Martinez D, Millner PA, Coral A, Newman RJ, Hardy GJ, Butt WP. Case report 745. *Skeletal Radiol* 1992;21:393–395.
19. DiCaprio MR, Damron TA, Stadnick M, Fuller C. Pigmented villonodular synovitis of the elbow: a case report and literature review. *J Hand Surg* 1999;24A:386–391.
20. Chaljub G, Johnson PR. In vivo MRI characteristics of lipoma arborescens utilizing fat suppression and contrast administration. *J Comput Assist Tomogr* 1996;201:85–87.