

Giant synovial lipoma arborescence of the right knee in a 76-year-old diabetic woman with purulent joint effusion

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Accepted for publication on 24 January, 2006

Background: Lipoma arborescence (villous lipomatous proliferation) is a rare intraarticular lesion. Although the origin of it remains unclear, it is suggested as a hamartomatous lesion of the synovium.

Case: We report a case of a giant lipoma arborescence in the right knee joint of a 76-year-old diabetic woman with purulent bloody joint effusion. Magnetic resonance imaging (MRI) findings was misdiagnosed as villonodular synovitis.

Conclusion: Although MRI is a useful tool for establishing the diagnosis and evaluating the extent of joint involvement, the definite diagnosis can be made by arthroscopic biopsy. As many cases with LA in the literature have also diabetes mellitus, a relationship should be searched.

Keywords: Lipoma arborescence, knee, purulent joint effusion

Introduction

Lipoma arborescence (LA) is a rare benign intraarticular lesion.¹ This lesion is more common in elderly, but also seen in young adults and pediatric patients.^{2–5} Its etiology is not known. LA consists of fat tissue distending synovial villi and is characterized by diffuse replacement of the subsynovial tissue by mature fat cells, producing villous transformation of the synovium. This disease is most commonly seen in the knee joint. Affected patients usually have a long-standing, slowly progressive swelling of the joint with recurrent effusions particularly in the suprapatellar region which is accompanied by variable pain and limitation of joint movements.^{6–8} Although MRI findings may suggest a fatty synovial proliferation, synovial biopsy is necessary to confirm the diagnosis.

Case

A 76-year-old (weighing 102 kg) woman presented with a painful swelling in her right knee for about six

year duration. She was suffering from diabetes mellitus for 5 years and hypertension for 20 years. She had no history of trauma to the knee. Physical examination showed an effusion in suprapatellar pouch.

Plain radiography showed a huge soft tissue mass with the dimensions of about 20x10 cm in the suprapatellar region. It also showed bilateral osteophytes in the tibial plateau and erosive changes of the subchondral bone in both lateral femoral condyles.

Magnetic resonance imaging (MRI) revealed a cystic mass with villous component and intraarticular fluid localized within the knee joint. The characteristics of the villous component of the lesion in T1-weighted spin-echo (SE) (TR/TE: 450/12 ms), and T2-weighted SE (TR/TE: 3690/87 ms) images were similar to those of the subcutaneous adipose tissue. There were osteophytes in the knee joint as well (Figure 1).

The results of routine laboratory tests, including erythrocyte sedimentation rate, VDRL tests, and blood

uric acid determinations were unremarkable. Rheumatoid factor was negative.

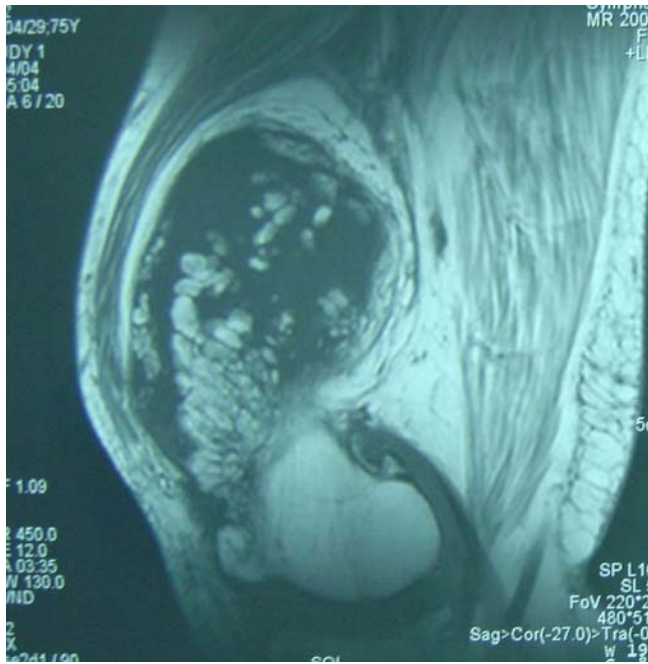


Figure 1. T2 weighted MRI of the knee joint, sagittal section, villous synovial proliferations within the suprapatellar pouch.

Aspiration of the right knee yielded 10 ml of brown-green fluid, which was negative for crystals. A lot of neutrophils, erythrocytes and a few synovial cells were seen in cytological examination.

During arthroscopy, biopsy was performed from the lesion and it was diagnosed as lipoma arborescence in pathological examination. Subsequently, open synovectomy was performed and the lesion excised totally.

On gross examination lobulated finger like yellow colored, soft fatty mass was seen to be attached to synovia. The removed mass was measured as 22x10 cm and its thickness, together with the hypertrophic joint capsule, was up to 5 cm (Figure 2). On cross sections the cut surface revealed large areas of yellow, mature fatty mass. Microscopic examination revealed finger like villi containing adipose tissue and covered by proliferated synovial membrane. Prominent villous projections ranging from slender papillae to thicker irregular nodules were also noticed. Although synovial membrane was thickened in general, it was also eroded in some areas giving rise to dilated blood vessel proliferation, mild neutrophilic exudation and erythrocyte extravasation. Non-specific chronic

inflammatory cells were also seen beneath the synovial membrane (Figures 3a and 3b).



Figure 2. Macroscopic appearance of lipoma arborescence.

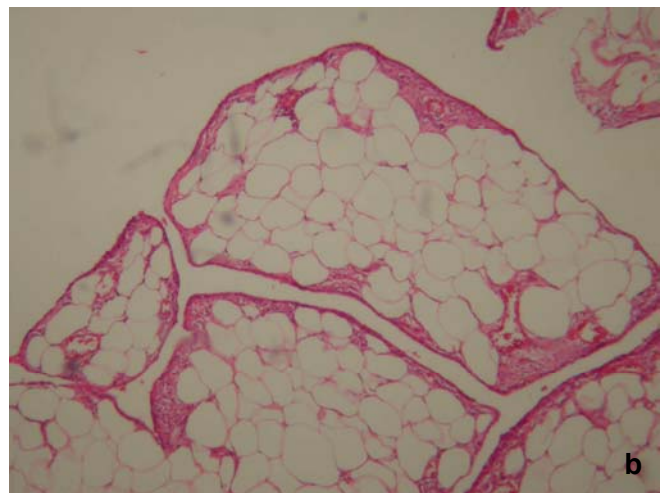
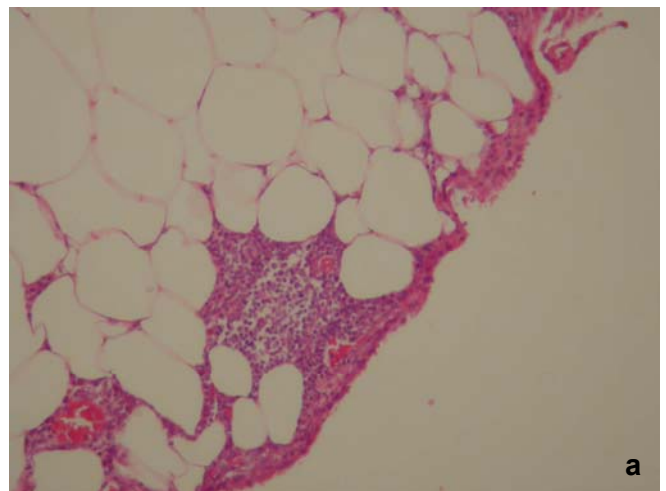


Figure 3. a: Thickened synovial membrane and inflammatory cells beneath it (H&Ex200).
b: Finger like villi infiltrated by fatty tissue (H&Ex40).

Discussion

Lipoma arborescence is a rare, benign intraarticular lesion characterized by marked villous proliferation and diffuse replacement of the synovial tissue by mature adipose cells.¹ It is usually diagnosed while it is small in diameter. There is only an exceptional case in the literature concerning big size of lesion like ours.⁸ In this paper, a huge LA (20x10x4 cm) was reported causing a 15 ml yellowish sterile fluid transudation, which did not contain any crystals or cells. Our case had a mass of 22x10x5 cm in the right knee, typically with a suprapatellar synovial effusion although it was unexpectedly bloody and purulent. Microscopically villous lipomatous proliferation of the synovium was seen. Patchy denuded areas were observed in synovial membrane covering fat-filled hypertrophic villi. This is most probably related to impaired tissue perfusion due to the pressure of the big fatty mass. In many reported cases the synovial effusion usually was free of cells, or only a few red and white blood cells could be seen.^{2,6-8} In our case, most of inflammatory cells in synovial fluid were neutrophils (60-70%) and it is unusual. It is known that rheumatoid arthritis, septic arthritis and crystal arthropathy can cause purulent joint effusion. Although our patient is known to suffer from diabetes mellitus for five years and also degenerative osteoarthritis, these conditions fail to explain purulent exudate. Therefore the bloody and purulent effusion in our case can only be explained by congested and proliferated blood vessels beneath the denuded areas like a reported another case with hemarthrosis.⁹

Although definite etiology of LA is unknown, it is considered to be a hamartomatous lesion usually associated with benign reactions involving the synovium such as trauma, infection, osteoarthritis, rheumatoid arthritis and diabetes mellitus.^{2,8,10} As the last three are frequent in elderly, the likelihood that these diseases and LA may coexist in elderly patients should be kept in mind. Knee is the most commonly involved joint and the effusion fluid is generally accumulated in the suprapatellar pouch. Symptoms consist of gradual joint swelling, variable pain, restriction of movements, and intermittent joint effusion or bleeding. Involvement of the elbow, shoulder, and hip have also been reported. In some of these cases there were bilateral involvement.^{3,11-13}

Although it is mostly found in elderly patients in fifth to sixth decades, it could be seen even in childhood.²⁻⁵

Although on MRI examination villous projections of synovia was thought to be villonodular synovitis, microscopy revealed villous projections filled with Oil-red-O and S-100 positive mature adipose cells in our case.

The differential diagnosis should include synovial lipoma, villonodular synovitis, synovial chondromatosis, synovial hemangioma and rheumatoid arthritis. Synovial lipoma is usually solitary, round or oval mass with a regular surface. Pigmented villonodular synovitis, which is a locally destructive fibrohistiocytic proliferation characterized by many villous and nodular synovial protrusions affecting joints, bursae and tendon sheaths usually affects patients in the second and third decades. The knee is the most commonly affected joint and most of patients present with bloody joint effusion.¹

If the lesion is not so big lipoma arborescence can be treated by arthroscopic synovectomy, but open synovectomy is the recommended treatment for the lesions that cannot be resected arthroscopically. Recurrence after open synovectomy is reported in one case.¹⁴

In conclusion, lipoma arborescence is a rare benign lesion that must be taken into consideration in patients who have chronic joint effusion with chronic arthritis or diabetes mellitus. Although MRI is a useful tool for establishing the diagnosis and evaluating the extent of joint involvement, the definite diagnosis can be made by arthroscopic biopsy. As there are many cases with LA in the literature have also diabetes mellitus, it is logical to search a relationship between these two.

References

1. Enzinger and Weiss's Soft tissue tumors, Sharon W. Weiss, John R. Goldlum-4th ed. St. Louis, United States of America 2001: 613-615.
2. Nisolle J.F, Boutsen Y, Legaye J. et al: Monoarticular chronic synovitis in a child. *Br J Rheumatol* 1998; 37: 1243-1246.
3. Haasbeek JF, Alvillar RE. Childhood lipoma arborescence presenting as bilateral suprapatellar masses. *J Rheumatol* 1999; 26: 2283.
4. Donnelly LF, Bisset GS 3rd, Paso MH. MRI findings of lipoma arborescence of the knee in a child. *Pediatr Radiol* 1994; 24: 258-259.

5. Tiao WM, Yeh LR, LU YC, Liang HL, Chen CK. Lipoma arborescence of knee: a case report. *J Formos Med Assoc* 2001; 100: 412-415.
6. Narvaez J, Narveaz JA, Ortega R, et al. Lipoma arborescence of the knee. *Rev Rhum Engl Ed* 1999; 66: 351-353.
7. Franco M, Puch J.M, Carayon M.J, Bortolotti D, et al. Lipoma arborescens of the knee: report of a case managed by arthroscopic synovectomy. *Joint Bone Spine* 2004; 71: 73-75.
8. Chung C, Lee C, Yeh T, Huang G, Wu S. Intra-articular lipoma arborescens of the knee joint. *J Med Sci* 2004; 24: 223-226.
9. Edamitsu S, Mizuta F, Matsukawa A, Takagi K. Lipoma arborescens with hemarthrosis of knee. A case report. *Acta Orthop Scand* 1993; 64: 601-602.
10. Karahan OI, Baykara M, Gulec M, Duygulu F. Mediopatellar plica limiting lipoma arborescens in the knee joint. MRI findings. *Eur J Radiol* 2003; 47: 55-58.
11. Sumen Y, Ochi M, Soda Y, Ikuta Y. Lipoma arborescens in bilateral knee joints. *Arch Ortop Trauma Surg* 1998; 117: 105-107.
12. Levadoux M, Gadea J, Flandrin P et al. Lipoma arborescens of the elbow. *J Hand Surg* 2000; 25: 580-584.
13. Noel ER, Tebib JG, Dumontet C, et al. Synovial lipoma arborescens of the hip. *Clin Rheumatol* 1987; 6: 92-96.
14. Conventry MB, Harrison EG, Martin JF. Benign synovial tumors of the knee: a diagnostic problem. *J Bone Joint Surg Am* 1966; 7: 1350-1358.