

Lipoma arborescens of the kneeMohammed R Obaid^{1*} Addi Al Ali²**Case report**

We reported 38-year-old female patient who complained of pain and recurrent episodes of right knee joint swelling for the last 15 years. After anamnesis, physical examination and radiographic imaging and magnetic resonance were diagnosed with arborescent lipoma of the knee, and the patient underwent two operations, 1st one arthroscopic surgery for resection of the lesion (partially), 2nd one [after 2 years] open arthrotomy. Histopathology for biopsy was done for both operations, which confirmed the presence of benign synovial tissue and fragments of adipose tissue present beneath the synovial surface. Postoperatively, on 2-years follow-up, the patient was free of pain and devoid of any mechanical symptoms, but all sudden patient developed pain limping, and swelling in the same right knee joint, the same steps of clinical examination and investigations as mentioned above was done, MRI showing the recurrence of the lesion.

Keywords: Knee; Lipoma arborescens; Synovial membrane* Correspondence author: clarus_1997@yahoo.com¹Al Hussain Teaching Hospital (Muthanna)²Basra General hospital/Basra

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<http://dx.doi.org/10.18081/2410-4590/2018-107-114>**Introduction**

Arborescent lipoma, also known as villous lipomatous transformation of synovium is a very uncommon primary benign intra-articular lesion of synovium. About 5 cases have been reported [1]. There have been single case reports in the majority of literature and the largest reported series included 6 cases [2]. The Latin term “arborescens” means “tree-like appearance” describing the characteristic villous and frond-like morphology of this condition, and it was first described by Dr. Albert Hoffa, in relation to Hoffa’s disease in 1904 [3]. The condition is characterized by diffuse replacement of synovial tissue by mature adipocytes causing a villous lipomatous proliferation of the synovial membrane [4] (figure.1).

Figure 1.

Showing a villous lipomatous proliferation of the synovial membrane

Typically, this is a monoarticular condition, several cases of bilateral knee involvement have been reported [5]. The knee is the most commonly affected joint, but involvement of other joint such as the hip, the shoulder, the wrist, the elbow, and the ankle has been reported. The highest incidence of presentation occurs in the fourth and fifth decades of life. It was also reported in pediatric age group [6], and there is no predilection for gender [7]. The typical clinical presentation consists of long standing slowly progressive and recurrent effusions, often with large volume, accompanied by a diffuse and intermittent pain. In the knee the condition commonly affects the suprapatellar pouch, with a soft consistency on palpation. Restricted range of movement may be associated. Clinically, there is a soft boggy swelling in the suprapatellar pouch. In primary type Laboratory tests (erythrocyte sedimentation rate, C-reactive protein, serum urate) are usually normal. HLAB27 and rheumatoid factor are also negative. Plain radiographic studies may be normal or show nonspecific changes, such as soft tissue swelling or even degenerative changes. According to Ryu, about 38% of patients show bone erosions at the articular margin [8]. Magnetic resonance imaging (MRI) is the primary diagnostic test, which reveal an intra-articular synovial mass with frond like structure and fat signal intensity on all pulse sequences [9]. Finding on MRI is considered by some authors to be pathognomonic for arborescent lipoma, which enables the establishment of diagnosis even before the results of histopathological examination. The recommended treatment of Arborescent lipoma is open or arthroscopic synovectomy, with very rare cases of recurrence of pathology [10].



Case Report

Female 38 years old had episodes of a painful swelling in the right knee with recurrent hydrarthrosis without any triggering traumatic event since age 19 years old. She denied any history of giving way or locking of the joint. The patient had no family or personal history worthy of note. She was admitted to hospital several times and in each time was treated by rest, antibiotics, anti-inflammatory drugs and repeated arthrocentesis. These measures yielded only temporary symptomatic relief without reaching a diagnosis of the condition.

Physical examination was unremarkable except for a palpable swelling (soft mass in the suprapatellar pouch) in the right knee. There were neither warmth nor redness, but the range of

passive and active knee movement was limited. Compression of the patellofemoral joint elicited tenderness and pain. Clinical tests for ligamentous and meniscal lesions were negative. Plain radiographs of the knee, figure 2 showed reduced medial joint space, subchondral sclerosis, and reactionary osteophytes.



Figure 2
Plain lateral radiograph of the right knee



Figure 3
Plain AP radiograph of the right knee

MRI of the knee, figure 3 demonstrated a large joint effusion, hypertrophy of synovial membrane with indentation and fat signal intensity with finger-like aspect and lipomatous content on the lateral aspect of the joint.

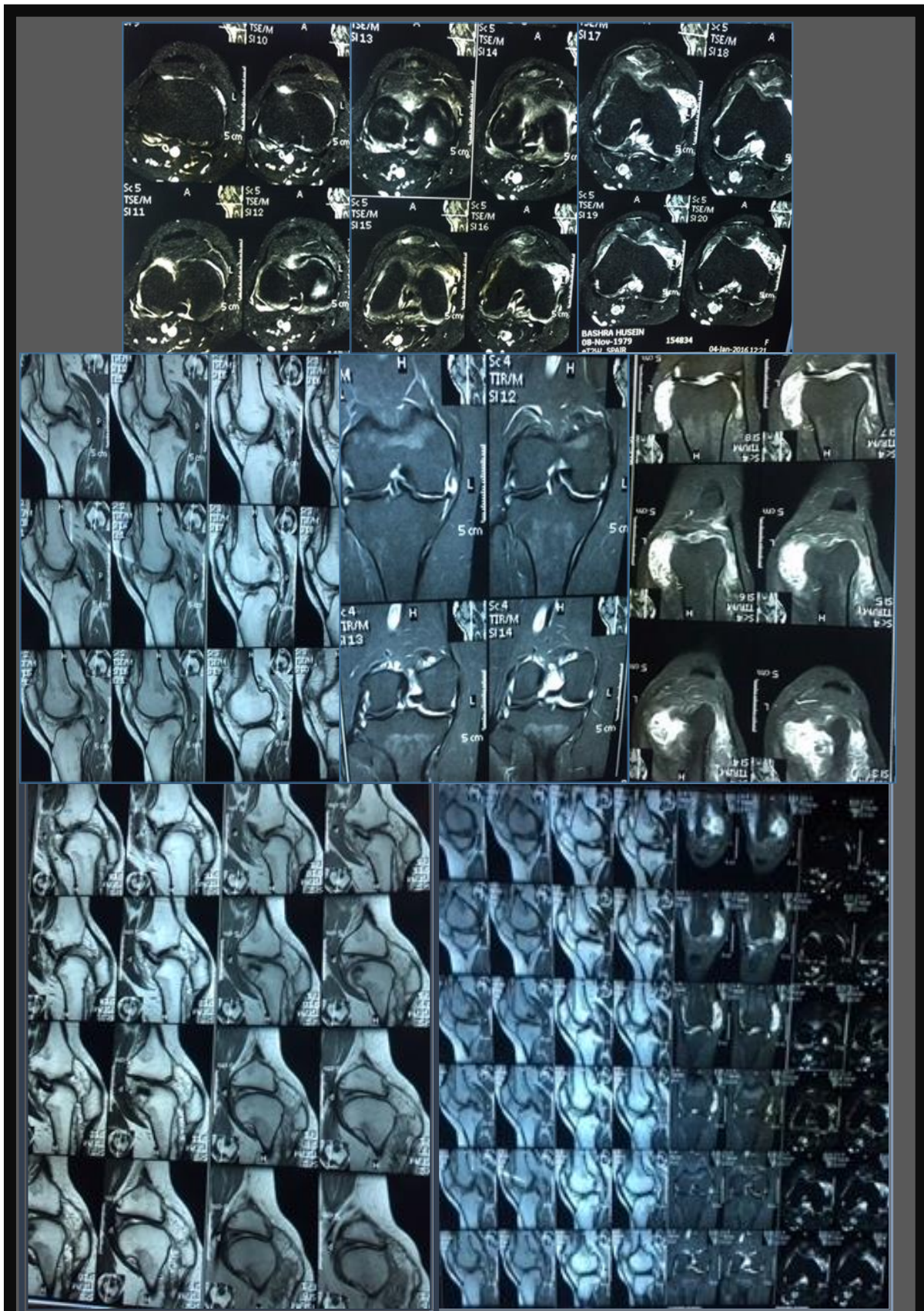


Figure 3.
MRI series of right knee

Before, 2-years arthroscopic synovectomy was performed by the author. The arthroscopic findings at that time revealed synovitis of pedunculated appearance with large, multiple globular and villous projections of different colors mainly whitish, red and translucent involving the anterior and suprapatellar compartments of the knee joint. The posterior compartment, as visualized through the intercondylar notch, was normal. The medial tibio-femoral compartment and patella-femoral joint had significant grade III/IV chondromalacia. Histopathological examination of the obtained material confirmed the diagnosis of lipoma arborescence. Postoperative period passed uneventful and the patient showed excellent subjective and objective improvements with absence of previous symptoms. Two years later, the patient started to develop pain with recurrence of slowly progressing swelling in the same right knee joint. On repeating Clinical, laboratory and radiological examinations, all showed similar results as obtained prior to arthroscopic management and recurrence of the condition was evident. The patient was subjected to surgery again in form of open arthrotomy through a mid- parapatellar arthrotomy and total synovectomy was performed. Multiple drilling to the exposed medial femoral condyle bone was done also. A drain suction was applied for 48-hours, collecting a volume of approximately 350 mL of blood. The patient was discharged home without complaints the 2-next days after the procedure. The result of histo-pathological examination of the biopsy specimen revealed by gross examination there was hypertrophied grey yellowish synovium with appearance of fatty tissue and vague small projections on the surface. Microscopic examination showed fragments of synovial tissues exhibiting hyperplastic synovial membrane with underlying variably inflamed stroma exhibiting infiltrations by unremarkable lobules of mature adipocytes.

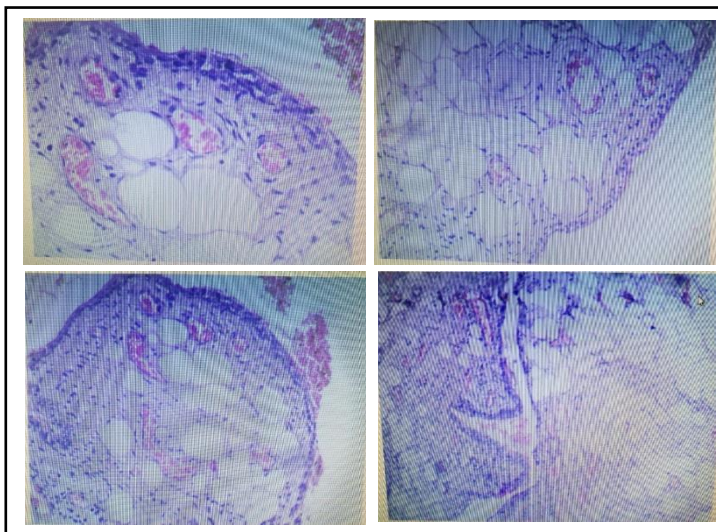


Figure 4.

Histo-pathological examination showed hypertrophied grey yellowish synovium with appearance of fatty tissue and vague small projections on the surface. Microscopically, examination showed fragments of synovial tissues exhibiting hyperplastic synovial membrane with underlying variably inflamed stroma exhibiting infiltrations by unremarkable lobules of mature adipocytes.

Rehabilitation through physical therapy program was arranged immediately after discharge, aiming to maintain the range of motion and muscle control, and the patient was allowed to support the weight as tolerated. Thirty days after surgery, the patient could return to her usual activities. In her latest follow-up visit (approximately three months postoperatively), the patient was asymptomatic with minimal joint effusion.

Discussion

Arborescent lipoma is a condition characterized by diffuse replacement of sub-synovial tissue by mature adipocytes, with prominent villous transformation [11]. Its etiology is unknown [9], although in some cases this lesion may be associated with certain conditions, such as degenerative joint disease, diabetes mellitus, rheumatoid arthritis, and psoriatic arthritis, suggesting the possibility of a reaction process [4]. Popliteal cysts were noted in approximately 20% of reported cases [11]. Although the knee is the most commonly affected joint, there are also reports of involvement in the wrist [11, 12], elbow [11, 13], shoulder [11, 14], ankle [11, 15], and hip [11, 16]. The differential diagnosis of arborescent lipoma of the knee includes pigmented villonodular synovitis, intra-articular lipoma of the knee, synovial chondromatosis, synovial hemangioma, and rheumatoid arthritis [4, 11]. Its insidious clinical course, supplemented by tests such as radiography and mainly MRI, virtually confirms the diagnosis. MRI should narrow down the possible diagnosis. Lipoma arborescens usually arises in the suprapatellar pouch, whereas synovial hemangioma and synovial lipoma are usually located in the infrapatellar fat pad [17]. A synovial mass of villous architecture depicting isointensity with subcutaneous fat (hyperintense on T1, which is abolished in the sequences with fat saturation) can be seen on MRI. There is no contrast uptake by the lesion, which excludes other inflammatory or neoplastic processes of the synovium. However, some intra-articular diffusion of the contrast into the joint fluid, with insinuation between the synovial lipomatous villous projections, can be seen, giving rise to small areas of uptake [4]. Nowadays, with the more widespread use of MRI, it has become more easier to diagnose this pathology. Macroscopically, Lipoma arborescens has a frond-like appearance with numerous broad-based polypoid or thin papillary villi composed of fatty yellow tissue. Histologically, the villi are composed of mature adipose tissue and enlarged or congested hyperemic capillaries may be present. The overlying synovial membrane may contain mononuclear chronic inflammatory cells and the synovial cells may seem to be enlarged and reactive with abundant eosinophilic cytoplasm [11]. The differential diagnosis of a chronically swelling in the suprapatellar pouch includes beyond lipoma arborescens, pigmented villonodular

synovitis, synovial lipoma, true intraarticular lipoma, synovial chondromatosis, synovial hemangioma, amyloid arthropathy, and xanthomata. MRI should narrow down the possible diagnosis. Lipoma arborescens usually arises in the suprapatellar pouch, whereas synovial hemangioma and synovial lipoma are usually located in the infrapatellar fat pad [17]. Synovial chondromatosis usually shows typical chondroid calcification on plain x-ray. Pigmented villonodular synovitis shows low signal intensity on [T1] and [T2] MR images (hemosiderin accumulation) which enhanced strongly with contrast [18]. Synovial hemangioma shows low signal on [T1] with high signal on [T2] and hypo-intense linear fibrous septa [19]. True intra-articular lipoma shows low signal intensity on [T1] and high signal intensity on [T2] [20]. The surgical treatment of lipoma arborescens is complete excision. Open synovectomy is known to be curative. A single case of recurrence had been reported by Coventry *et al* [19] and this procedure causes some short-term morbidity. Successful treatment with arthroscopic synovectomy has been reported with no recurrence at short duration of follow-up [21]. A drain suction should be applied for a period of approximately 24 hours after the surgery, in view of the bleeding that occurs after the procedure. Otherwise, medical treatment by [Yttrium-90] radiosynovectomy or intra-articular injection of steroid may lead to resolution of symptoms in the short to medium term [22]. In the case described, the location of the pathology and its monoarticular feature, as well as the description of symptoms, age of the patient coincides with the literature. With a follow-up of about three months, it can be concluded so far that the proposed treatment by open surgery was appropriate for huge and recurrent tumor, and arthroscopic debridement is good for early and mid-term osteoarthritis with Lipoma arborescens surgery also can be the good choice for viewing the lesion taken biopsy histopathological examination to confirm the diagnosis.

Conflicts of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or nonfinancial interest in the subject matter or materials discussed in this manuscript.

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