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Lipoma Arborescens: A Case of Massive Knee Swelling

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Abstract

Lipoma arborescens is not so common condition of unknown etiology. The usual presentation is that of a long standing mono articular soft tissue swelling involving the knee joint. This diagnosis is not often made clinically but usually made with the help of Magnetic Resonance imaging and Biopsy. We are reporting a case of chronic massive knee joint swelling so as to raise awareness about the condition and its imaging features, so that misdiagnosis can be avoided and early appropriate treatment can be given.

Keywords: Lipoma arborescens, Synovium, Magnetic Resonance Imaging

Introduction

Lipoma Arborescens [LA] or synovial lipomatosis is not so common condition of unknown etiology. It was first described by Arzimanoglu in 1957 [1]. It is characterized as sub synovial mature fat infiltration with moderate infiltration of mononuclear inflammatory cells leading to the formation of frond like hypertrophic villi of the synovium, which gives the name arborescens. We present a case involving the suprapatellar pouch of the knee.

Case Report

39-year-old male, farmer, reports with a gradually progressive painless massive right knee joint swelling for the past 3 years. He had ignored the swelling however a recent fall which caused an increase in size and pain prompted him to seek medical attention. He doesn't have any history of morning stiffness or constitutional symptoms. On physical examination, a swelling measuring about 15x20x20 cm (Figure 1), cystic in consistency with joint line tenderness, with no other signs of inflammation was noted. Range of movement was about 40 to 110 degrees with an extension lag of 40 degrees. Laboratory data showed normal white blood cell count- 8740/µL [4000-11,000/µL], Erythrocyte sedimentation rate [ESR]- 8mm/hour [0-9 mm/hour], Thyroid stimulation hormone- 0.86 µIU/mL [0.35-4.94 µIU/ml], Uric acid- 3.8 mg/dL [3.5-7.2 mg/dL], Rheumatoid factor <10 IU/ml [up to 18 IU/ml] and a slightly elevated C-reactive protein– 1.2 mg/dl [<0.5 mg/dl]. Aspirated synovial fluid had a reddish hue and showed no abnormal findings such as crystals and bacteria. The Magnetic resonance imaging [MRI] showed frond like synovial projections, hyperintense on T1 and T2 weighted images and suppressed on STIR sequences suggesting fat content, reported as probable diagnosis of lipoma arborescens with moderate osteoarthritis (Figure 2). Since it was too huge a swelling, we went ahead with Enbloc tumor resection with total synovectomy and biopsy (Figure 3). About 2 liters of reddish tinge fluid were drained out. The histopathological report showed sub synovial mature adipocyte proliferation and infiltration with plasma cells and lymphocytes, confirming the clinical and radiological diagnosis of Lipoma Arborescens (Figure 4). There was no recurrence of the swelling at 6months follow up (Figure 5). His knee functional scores, IKDC [International knee Documentation committee] improved from 28.3 to 82.6 and VAS [Visual analogue Score] improved from 7/10 to 2/10.

Discussion

LA is an uncommon case, with fewer than 100 cases reported [2]. Two types of LA have been described. Primary LA usually occur in young patients which can cause degeneration of the knee joint [3], while secondary LA is more common in older patients and is thought to be due to nonspecific reaction of synovial membrane due to chronic synovitis. Both sexes are equally affected [4]. The usual presentation is monoarticular involvement of knee [5, 6]. Polyarticular involvement have also been reported but rare [7, 8]. Other reported areas include ankle [6], shoulder [9], hip [10], elbow [11], hand, wrist [12] and synovial sheaths of tendons [13]. Most of the patients don't have any associated musculoskeletal pathology, but it has been associated with trauma [14], osteoarthritis [15], rheumatoid arthritis [16], psoriasis [5], hypothyroidism [17], gout [18], short bowel syndrome [7], diabetes mellitus and sarcoidosis.

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Figure 1: Clinical picture of the swelling from front and side

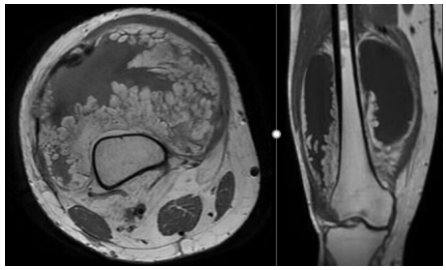

Figure 2: Axial and Coronal T1 weighted sequence images showing synovial mass with frond like projection.

Figure 3: Intra operative images of the lesion and Total synovectomy specimen

However, in our patient the biochemical parameters– Rheumatoid factor, Thyroid stimulation hormone and uric acid were normal. Patients usually present with insidious onset of painless joint swelling which becomes chronic or recurrent swelling even lasting for decades. There can be associated limitation in the range of motion. Locking or popping due to the trapping of the hypertrophied villi between the joint surfaces may be present. The lesion is usually soft and boggy in consistency. Serological evaluation for total counts, ESR, rheumatoid factor, uric acid and thyroid stimulation hormone should be done and joint aspiration to look for crystals and culture should also be done. Plain radiographs usually show nonspecific soft tissue swelling around the involved joint at the early stage, however in later stages, features of secondary osteoarthritis like bone cyst and subchondral erosion may be detected. Some authors have speculated that LA might contribute to the development of osteoarthritis [15]. The diagnosis is often clinched with MRI. The picture usually will be ill defined non encapsulated synovial mass with frond -like configuration with fat signal intensity on all pulse sequences [13]. Contrast administration is usually not needed for the diagnosis. A review of MRI characteristics of LA was done by Solar et al. [14] and suggested the existence of three common morphological forms: isolated frond like fatty sub synovial mass, multiple villous lipomatous synovial proliferation and mixed pattern. The signal characteristics in MRI helps to differentiate LA from other clinical conditions like Pigmented villonodular synovitis [PVNS], synovial chondromatosis, rheumatoid arthritis, synovial lipoma and synovial hemangioma. PVNS due to the presence of hemosiderin has low signal intensity on all pulse sequences. Synovialchondromatosis have low to intermediate signal on T1-weighted sequences and variable signal on T2– weighted sequences due to its cartilage component, while in rheumatoid arthritis there is intermediate signal on T1 and T2 weighted images due to synovial proliferation with fibrosis [13]. Synovial lipomas are usually round to oval masses of fat in the joint however synovial hemangiomas are characterized by flow void and intense enhancement. Macroscopically LA looks like yellow or reddish yellow frond like proliferation of the synovium [15]. Histologically it appears as proliferated mature adipocytes covered by synovial cells, with infiltration of chronic mononuclear inflammatory cells. Open synovectomy is the treatment of choice however recently arthroscopic removal is also preferred [15,19]. The decision for an arthroscopy-assisted or open surgical intervention will depend on tumor location, its

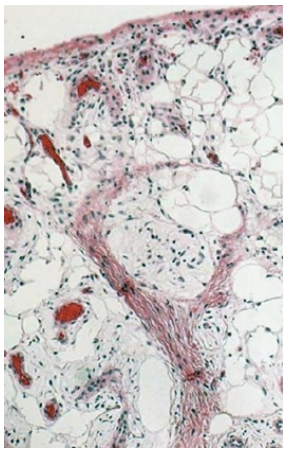

Figure 4: Histopathology- High magnification photomicrograph with Hematoxylin and Eosin staining showing mature adipocytes with scattered chronic inflammatory cells under hyperplastic synovial layer

Figure 5: A: Preoperative clinical image; B: Clinical image at 6 months follow up, compression stockings applied to prevent lymphedema; C&D: Range of movement at 6 months follow up

size, the involved joint and the experience of the surgeon. Recurrence of the lesion is uncommon [19]. To summarize LA is a not so common condition which should be considered as a differential diagnosis in patients complaining of chronic and recurrent joint swelling. Early detection and resection help to improve the quality of life of the patient and prevents the development of osteoarthritis.

Conclusion

Lipoma arborescens is a benign slowly progressive proliferative disorder of the synovium which commonly involves the knee joint. Less commonly it can also involve other joints like ankle, shoulder, hip, elbow, hand, wrist and synovial sheath of tendons. Diagnosis can be clinched with the characteristic Magnetic Resonance Imaging and Biopsy. Clinical awareness of such an entity will help in the early diagnosis and treatment, and thereby avoid misdiagnosis of the condition as an aggressive tumor.

Abbreviations Used: LA-Lipoma arborescens; ESR-Erythrocyte sedimentation rate; MRI-Magnetic Resonance Imaging ; IKDC-International knee documentation committee; VAS- Visual analogue Scale ; PVNS-Pigmented villonodular synovitis

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Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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