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Case Report

Secondary unilateral monoarticular Lipoma Arborescens of the knee - A Case report with review of literature.

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ABSTRACT

Secondary intra-articular lipoma arborescens is a rare entity that can present with monoarticular or polyarticular involvement of joints such as knees, ankles, hips, shoulders, and elbows. Lipoma arborescens is characterized by a diffuse increase in the quantity of subsynovial fat in supra-patellar region which bulges the overlying synovial lining and produces a villous architecture. We here report a 60-year-old woman who presented with unilateral monoarticular lipoma arborescens associated with Baker's cyst, chondromalacia and subchondral cysts of the left knee. Diagnostic arthroscopic synovectomy was performed. Histopathological examination revealed characteristic features of Lipoma arborescens. The etiopathogenesis and histopathological findings are discussed alongside with review of literature.

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1. Introduction

Secondary lipoma arborescens is an uncommon benign intra-articular lipomatous proliferation of the synovial joints and bursae [1]. The term "arborescens" originated from the Latin word 'arbor' meaning tree, thus describing the tumor's characteristic tree-like morphology. It occurs equally both in men and women [2]. It typically presents in patients between fifth to seventh decades of life. They can present with monoarticular or polyarticular involvement of joints such as knees, ankles, hips, shoulders, and elbows [2-7]. It can be classified into primary and secondary. The cause of primary lipoma arborescens remains unknown; while in secondary, associated conditions which include trauma, meniscal injuries, psoriatic arthritis, osteoarthritis, rheumatoid arthritis, diabetes mellitus and gout have been reported [1-5]. Clinically, it can present as chronic intermittent joint pain and swelling with a monoarticular or polyarticular pattern. We report a case of lipoma arborescens in an elderly lady presenting as a painless swelling with stiffness in left knee along with characteristic histopathologic features in the light of previous literature.

2. Case Report

A 60-year-old elderly woman presented with a painless swelling and stiffness in the left knee for 9 years duration. There were no constitutional or systemic symptoms. She had no previous history of trauma and/or associated systemic disorders. The patient was earlier treated with nonsteroidal anti-inflammatory drugs such as diclofenac with limited response. On physical examination, soft boggy swelling with effusion in the suprapatellar area and left knee were noted. There was no tenderness or redness. The joint movement was restricted without tenderness. Laboratory investigations which included (like) white blood cell count (WBC), erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), rheumatoid arthritis factor, serum glucose and uric acid levels were normal. The joint aspiration tests including gram stain, culture and crystals were unremarkable. Plain radiographs of the left knee joint [Fig.1a] showed well defined dense opacity in suprapatellar region extending into the patella-femoral joint space. Also noted were narrowing of the joint space, tibial spiking with marginal osteophyte. Magnetic Resonance Imaging [MRI] [Fig.1b] showed gross effusion and diffuse hypertrophy of synovium with replacement of synovial tissue by fat having hyperintense signal on T1 and hypointense signal on fat suppressed images involving supra patellar bursa and left knee joint. The additional findings [Fig.1b] included Baker's cyst, chondromalacia involving femoro-tibial and patello-femoral compartments of left knee joint and

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subchondral cystic changes of lateral femoral and tibial condyles. The patient subsequently was referred to the orthopedic clinic where she underwent diagnostic arthroscopy, which revealed diffuse yellow soft tissue synovial papillary growth involving the left knee joint and suprapatellar pouch. In addition, there was a gross effusion along with signs of degenerative changes in the left femoral and tibial condyles. Arthroscopic synovectomy of the left knee joint was performed and specimen was sent for histopathologic examination. Macroscopic examination of the specimen revealed multiple creamy yellow synovium with appearance of fatty tissue and vague small projections on the surface. Microscopic examination showed diffuse sheets of mature adipocytes, which had infiltrated and replaced the collagenous subintima of the synovium, bulging into and attenuating the overlying synovial cells; thus resulting in villus expansion of the synovium [Fig.2a]. There were focal patchy lymphoplasmacytic infiltrations between the adipose tissue [Fig.2b] and focal areas of fat necrosis beneath the synovial lining [Fig.3a]. Focal hypertrophy of the synovium was also noted [Fig.3b]. The final diagnosis was Lipoma Arborescens of the Left Knee.

Figure.1a: Plain Radiograph showing well defined dense opacity [Arrow] in the suprapatellar region with no bony erosions.

Figure.1b: MRI of left knee, showing synovial hypertrophy with indentations and fat signal intensity in supra-patellar area.

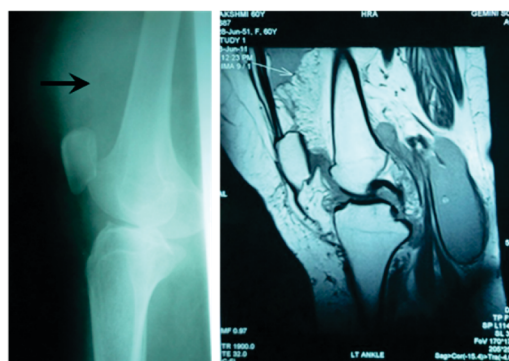


Figure.2a: Prominent villous projections (Arrow) of the synovium infiltrated by sheets of adipose tissue [H&E, x50].

Figure.2b: Focal lympho-plasmacytic infiltration (Arrow) between adipocytes [H&E, x100].

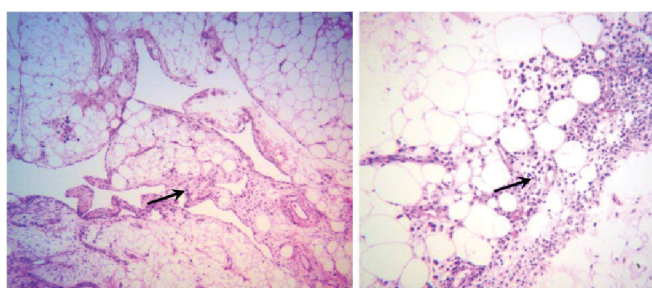
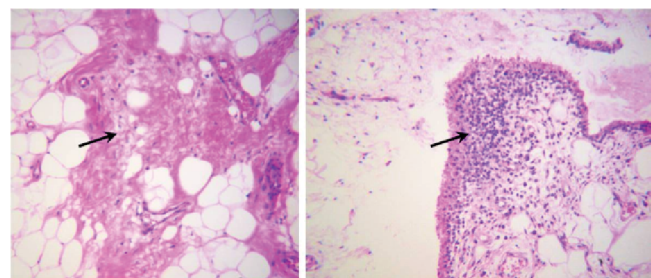


Figure.3a: Areas of fat necrosis (Arrow) [H&E, x100].

Figure.3b: Focal synovial hypertrophy noted (Arrow) [H&E, x100].



3. Discussion

Neoplasms of the synovium are rare and occur in the lining of joints, bursae and tendons. Theoretically, any type of tumour can arise in the synovium, but most recapitulate the cell types and tissues of the articular and periarticular tissues. Lipoma arborescens is a very rare benign intra-articular neoplasm of the synovium. It is known also as synovial lipomatosis, and is characterized by replacement of the subsynovial tissue by mature adipocytes, giving rise to prominent intra-articular villous proliferation of the synovium [1]. Lipoma arborescens has been reported in patients between the 9 and 68 years [2].

The exact etiopathogenesis of Lipoma arborescens is not known; but the majority of cases arises de novo. It has been suggested that there are 2 types of lipoma arborescens: primary and secondary [10, 11]. The primary type is rarely seen associated with degeneration of the joint and could be due to hereditary conditions [12]. The secondary type is defined as lipomatosis associated with degenerative disease of the joint. It is believed that chronic irritation resulting in repeated trauma can trigger their growth [13]. Thus, chronic irritation of the joints due to various conditions like degenerative joint diseases, trauma, chronic rheumatoid arthritis, psoriasis, gout, diabetes mellitus or a popliteal cyst may trigger formation of Lipoma arborescens [1-5]. In our patient there was a degenerative change in the joint like subchondral cystic changes of lateral femoral and tibial condyles, chondromalacia involving femoro-tibial and patella-femoral compartments of left knee joint and Baker's cyst. Also infiltration of lymphocytes and plasma cells were seen amidst the adipocytes. Thus, indicating that degenerative changes in the joint causes chronic irritation with persistent inflammation which might possibly reactivate the proliferation of subsynovial fat cells or else there could be metaplastic proliferation of subsynovial connective tissue to fatty tissue; finally resulting in lipoma arborescens. Lipoma arborescens has occurred in various anatomical sites including the knee, hip, elbow, shoulder, ankle and wrist [2-8]. Most of the patients' present as joint pain, intermittent swelling, and joint effusion where as painless swelling with gross effusion was observed in our patient. In most cases, MRI can demonstrate high signal intensity of fat in Lipoma arborescens on T-1 which was consistent with our patient [1-6].

The differential diagnosis of lipoma arborescens on histopathology includes other fat containing benign synovial disorders like synovial lipoma and Hoffa disease. The macroscopy of synovial lipoma usually appears as solitary, round to oval yellow masses and the microscopy shows mature adipocytes without villous synovial proliferation. Hoffa disease is a syndrome of infra patellar fat pad impingement between femoral condyle and patella [14]. Lipoma arborescens usually appears as a diffuse large frond like mass and fat infiltration with diffuse villous involvement of the synovial membrane is observed on microscopy. The treatment of lipoma arborescens is either arthroscopic synovectomy or open synovectomy with short term morbidity. Recurrence of the lesions following synovectomy is uncommon.

In conclusion secondary lipoma arborescens is a benign neoplasm of the knee joint possibly due to underlying degenerative joint disease. Although rare but lipoma arborescens should be in mind as differential diagnosis in long-standing swelling of large joints, especially knee joint.

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