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Lipoma Arborescens and Coexisting Psoriatic Arthritis

A Case Report and Review of the Literature

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Lipoma arborescens is a rare benign lesion characterized by villous lipomatous proliferation of the synovial membrane[1-3]. It is unclear whether it is inflammatory or neoplastic in origin. In 1953, Stout defined lipoma arborescens as a collection of fat beneath the synovial lining forming swollen villous projections[4]. While the etiology remains unknown, a non-neoplastic inflammatory origin is favored. It is well documented that the condition is often unilateral and that patients typically present with recurrent painless swelling of the affected joint(s)[2,5]. Bilateral cases involving the knee are rare[6]. Hoffa provided the first description in 1904[7]. He described twenty-one patients with a bilateral inflammatory fibrous hyperplasia of articular adipose tissue with swelling around the patellar tendon. To the best of our knowledge, there have been six published case reports of bilateral involvement with associated psoriatic arthritis of these uncommon and unusual

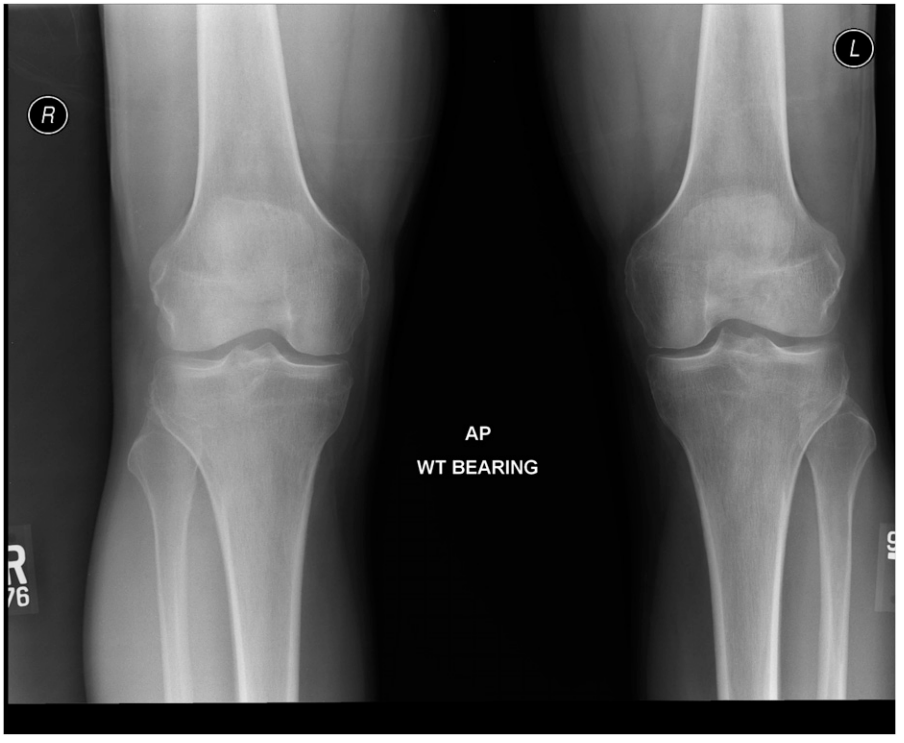

Fig. 1
Anteroposterior radiograph of both knees.

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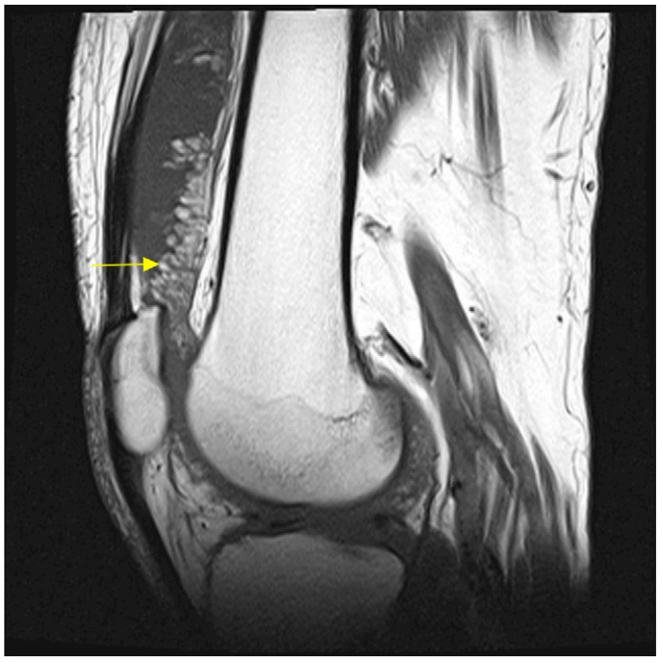

Fig. 2-A

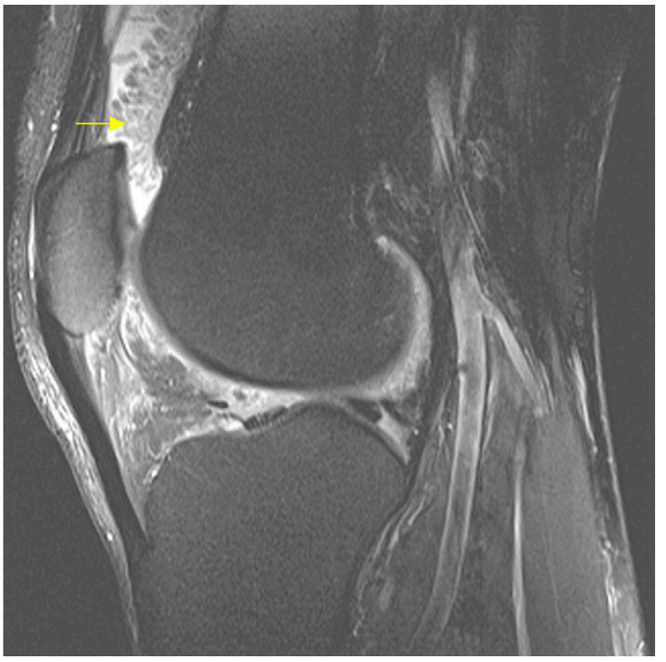

Fig. 2-B

T1-weighted (**Fig. 2-A**) and T2-weighted (**Fig. 2-B**) sagittal MRI scans of the right knee demonstrate diffuse villous frondlike lipomatous proliferation (arrows) and a large effusion.

lesions[3,6,8-11]. Our case report supports an inflammatory etiology of lipoma arborescens. We present a forty-five-year-old man afflicted with bilateral lipoma arborescens of the knee with coexisting psoriatic arthritis. We also summarize the clinical, imaging, and histologic patterns for lipoma arborescens reported in the knee to help distinguish it from similar knee lesions. The patient was informed that data concerning the case would be submitted for publication, and he provided consent.

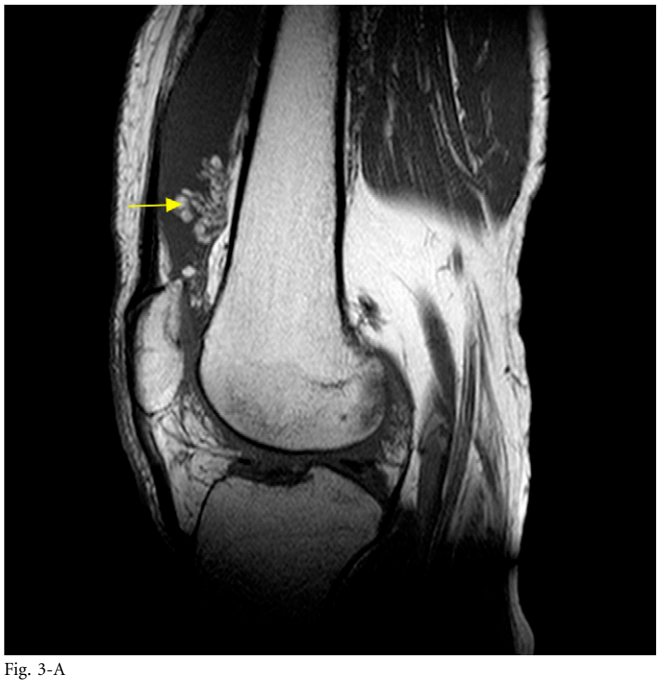

Fig. 3-A

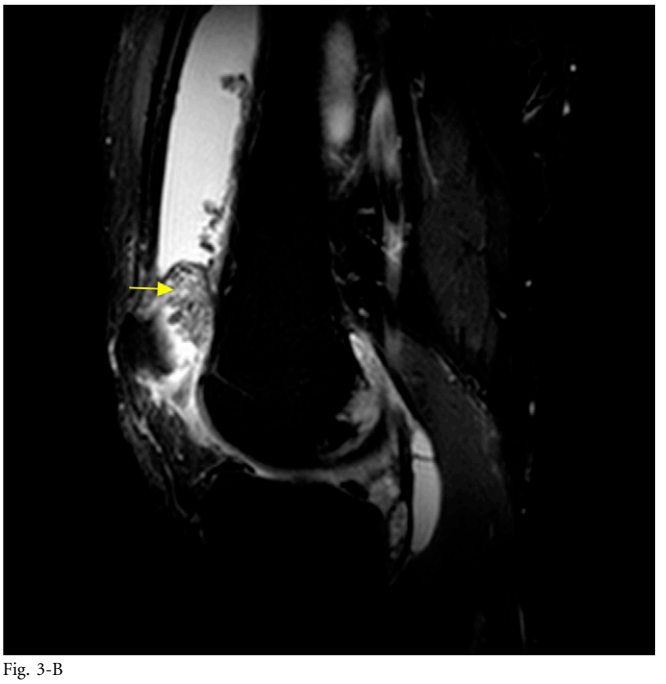

Fig. 3-B

T1-weighted (**Fig. 3-A**) and T2-weighted (**Fig. 3-B**) sagittal MRI scans of the left knee demonstrate diffuse villous frondlike lipomatous proliferation (arrows) and a large effusion.

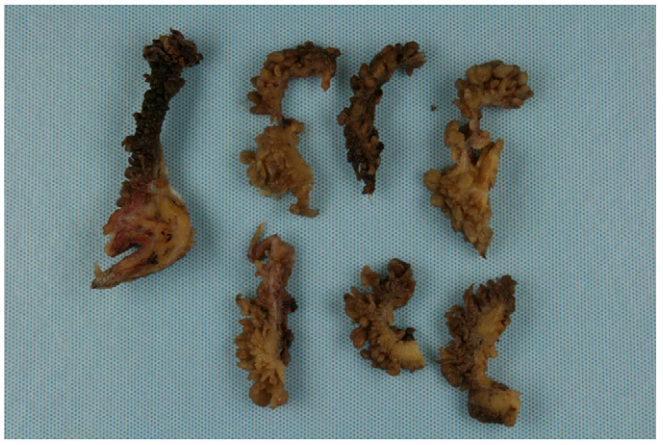

Fig. 4

Gross sections of synovial membrane demonstrate numerous plump grapelike villi distended with fibroadipose tissue.

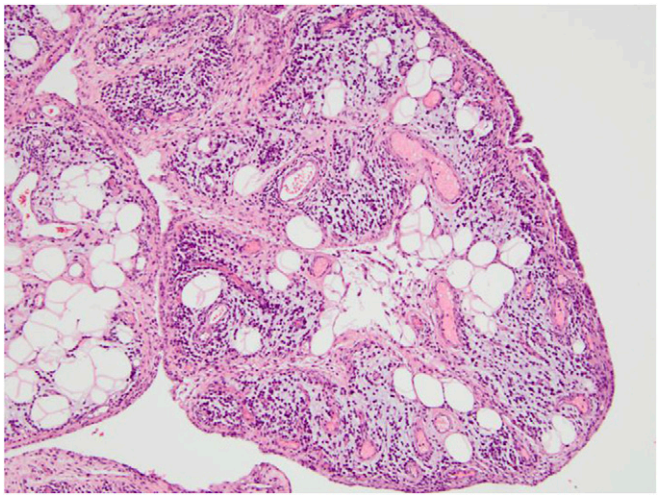

Fig. 5

Synovial-lined villous proliferation distended by mature adipose tissue containing a scattered chronic lymphoplasmacytic inflammatory infiltrate. Areas of fibrous tissue deposition are variable within the hypertrophied villi, as evident at higher magnification (hematoxylin and eosin stain, original magnification ×100).

Case Report

A forty-five-year-old man with presumed psoriasis presented with a history of three years of bilateral knee pain and swelling. This pain was exacerbated by activity and was worse in the morning. He noted stiffness and was limited in the activities of daily living. The patient treated the pain with narcotics. He also had pain in the ankles and left elbow. He stated that he had been given a short course of prednisone and was taking ibuprofen daily but had not been evaluated by a rheumatologist for the psoriatic arthritis. The medical history was noteworthy for non-Hodgkin lymphoma status post-chemotherapy and bone marrow transplant, testicular cancer status after radical orchiectomy (both the lymphoma and cancer had been in remission for over ten years), hypothyroidism, and hypertension.

Physical examination revealed effusions with intact skin in both knees. Range of motion allowed for full extension to 110° of flexion bilaterally, limited by the effusions. There was no palpable popliteal lymphadenopathy. There was substantial edema over the left ankle. The neurovascular examination was otherwise intact. Laboratory data revealed a C-reactive protein level of 2.09 mg/dL (reference range, <1.0 mg/dL), an erythrocyte sedimentation rate of 42 mm/h (reference range, 0 to 25 mm/h), negative rheumatoid factor, a positive antinuclear antibody test of 1:160, and negative Lyme antibodies.

Plain radiographs demonstrated bilateral mild tricompartmental degenerative changes in the knee with joint effusions (Fig. 1). T1-weighted, T2-weighted, and short tau inversion recovery (STIR) sagittal magnetic resonance imaging (MRI) showed diffuse small frondlike intra-articular masses that followed fat signal intensity on all sequences with a large effusion and an associated large Baker cyst (Figs. 2-A and 2-B, Figs. 3-A and 3-B).

Based on the clinical symptoms and the radiographic evidence of lipoma arborescens, the decision was made to proceed with surgical intervention. An open synovectomy through a medial parapatellar arthrotomy was performed on each knee. The masses were identified, and abundant lipoma arborescens tissue was noted within the suprapatellar compartment along the anterior aspect of the femur and medial and lateral gutters in the synovium (Fig. 4). The synovium of the patellar was found to be inflamed and was excised. There were no obvious chondral defects identified. Pathologic examination showed hypertrophic synovial villi with mature adipose tissue and chronic lymphoplasmacytic infiltrate, consistent with lipoma arborescens (Fig. 5).

The postoperative course was uneventful; the patient underwent physical therapy. Follow-up with MRI to evaluate for recurrence demonstrated residual lipoma arborescens in the posterior cruciate ligament recesses and effusions and synovitis in both knees. He walked unassisted and had normal knee range of motion. He was able to work as an auto mechanic without limitation. However, the knee pain had not improved postoperatively. Drug therapy consisted of short-acting oxycodone for the pain, and he was seeing a pain management specialist for chronic lower back pain and bilateral knee pain. A consultation by our rheumatology service formally diagnosed him with psoriatic arthritis, and he was prescribed sulfasalazine for medical treatment. Although residual disease was identified on the initial postoperative MRI, he had no clinical or radiographic signs of new disease.

Discussion

Lipoma arborescens is a rare non-neoplastic intra-articular villous lipomatous proliferation of the synovial membrane. Patients usually present with lipoma arborescens in the fifth and sixth decades, although the range of age of presentation has been reported as nine to sixty-eight years old. It is well documented that the most commonly affected joint is the

knee[1-3,5,6,8,9,12-14], and the suprapatellar pouch is the most susceptible region[9,13]. The published literature on lipoma arborescens consists mainly of case reports of unilateral lesions. There have been case reports of bilateral knee lipoma arborescens with other coexisting inflammatory arthropathies such as gouty arthritis, rheumatoid arthritis, and psoriatic arthritis. Bilateral involvement has been reported in up to 20% of affected patients[3,6,8,12].

There have been few case reports of unilateral lipoma arborescens of the knee with associated psoriatic arthritis[1,15], and even fewer case reports of bilateral lipoma arborescens of the knee with coexisting psoriatic arthritis[3,11]. Reports of the most common comorbid conditions include osteoarthritis[3,9,14], rheumatoid arthritis[9], joint trauma[1,9], and diabetes mellitus[1]; in 20% of cases, popliteal cysts are noted[1]. In addition, other locations of lipoma arborescens include the shoulder[16], hip[15], hand[17], and ankle[18]. Unfortunately, the nonspecific presentation of lipoma arborescens, combined with its association with chronic inflammatory disorders, degenerative joint disease, or trauma, increases its potential as an overlooked diagnosis[13].

The differential diagnosis of lipoma arborescens includes pigmented villonodular synovitis, synovial chondromatosis, true intra-articular lipoma, and chronic inflammatory synovial proliferation. However, the features on MRI are characteristic for lipoma arborescens and remain the gold standard for diagnosis, despite the need for histologic confirmation[9]. A frondlike villous synovial mass with fatty signal is demonstrated on T1-weighted, T2-weighted, and all pulse MRI sequences. There is sequence suppression with STIR imaging[19]. There is an associated joint effusion, chemical shift artifacts at the fat-fluid interface within the joint, and no evidence of hemosiderin deposits.

The histologic appearance of lipoma arborescens demonstrates a diffuse replacement of the subsynovial layer by mature adipocytes with infiltration of mononuclear inflammatory cells[2,12]. Recommended treatment is arthrotomy and synovectomy, which can be done via open synovectomy or arthroscopically. Sola and Wright reported successful treatment with arthroscopic anterior synovectomy, although, to the best of our knowledge, there are no reports in the literature on rates of recurrence and any advantages of arthroscopic versus open treatment[10].

The etiology of lipoma arborescens remains unclear as to whether it is inflammatory, neoplastic, traumatic, or developmental in origin. Hoffa and Weitzman suggested in their reports that lipoma arborescens was secondary to trauma[7,20]. However, there has been a growing body of consistent reports demonstrating a relationship between inflammatory or degenerative arthropathies and lipoma arborescens. At the cellular level, fibroblasts isolated from lipoma arborescens have been shown to produce increased levels of matrix metalloproteinase 3 (MMP-3) compared with osteoarthritis and rheumatoid arthritis fibroblast cultures[11]. MMP-3 destroys connective tissue and cartilage, contributing to joint inflammation, and serves as a prognostic indicator for the progression of joint damage in these inflammatory conditions.

In summary, lipoma arborescens is a rare and benign soft-tissue non-neoplastic process. It typically presents as a painless joint effusion primarily in the knee, with equal incidence in men and women. MRI findings are pathognomonic for the disease, with villous frondlike appearance with low signal on all pulse sequences as well as fat suppression with STIR sequences. Treatment with arthroscopic versus open synovectomies is usually curative; however, it is possible that recurrence has not been reported in the current literature because of lack of long-term follow-up. Our patient was initially encouraged to pursue medical management of the concurrent psoriatic arthritis prior to surgical intervention in order to reduce the inflammation. He was not interested in nonsurgical options, however, and continued to be symptomatic postoperatively. The outcome may have been improved if he had undergone medical treatment of the psoriatic arthritis to decrease the inflammation prior to surgery. This case demonstrates that surgery is not always curative; clear expectations of the procedure must be reviewed with patients prior to surgical intervention.

Although lipoma arborescens is rare, it should be considered in the clinical workup of patients with psoriatic arthritis and other chronic inflammatory diseases if they have symptoms of recurrent joint effusions. In our patient, the degree of joint destruction secondary to elevated inflammatory cytokines such as MMP-3 may have played a role in the less favorable outcome. Therefore, select patients with lipoma arborescens who have symptoms consistent with psoriatic arthritis or other inflammatory arthropathies may warrant referral to a rheumatologist for medical management to optimize clinical improvement. This case supports lipoma arborescens as a sequela to chronic inflammatory processes and demonstrates the relationship with concurrent inflammatory arthropathies. It is not clear whether inflammatory conditions such as psoriatic arthritis predispose patients to develop lipoma arborescens or if the presence of lipoma arborescens leads to an inflammatory condition; this remains an area of continued investigation. ■

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