



Case Report

Lipoma arborescens of the elbow: a case with features of a high-grade tumor[☆]



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ABSTRACT

Lipoma arborescens (LA) is an uncommon non-neoplastic disorder that may affect almost any joint, mainly the knee. LA is very rare in the elbow, and there are only a few cases reported in the literature. This study aimed to describe a case of LA in the elbow, presenting with features of a high-grade tumor. The authors report the case of a 51-years-old male who presented to this institution with pain and swelling on the left elbow. The patient had a seven-year history of investigation, with inconclusive diagnosis. Magnetic resonance imaging (MRI) showed an expansive mass with local aggressiveness. Due to these characteristics, it was not possible to discard soft tissue sarcoma at the differential diagnosis. After biopsy and a multidisciplinary team meeting, the authors opted for surgical resection. The final anatomopathological result confirmed the diagnosis of LA. Despite not being a true neoplasm, LA can cause many symptoms and functional impairment of the affected joint. It is important to keep this diagnosis in mind when any expansive mass surrounding a joint is observed.

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Lipoma arborescens do cotovelo: um caso com características de tumor de alto grau

RESUMO

O lipoma arborescens (LA) é uma doença não-neoplásica incomum que pode afetar quase todas as articulações, principalmente o joelho. O LA é muito raro no cotovelo e há apenas alguns casos relatados na literatura. O objetivo deste estudo é descrever um caso de LA no cotovelo, apresentando características de tumor de alto grau. Os autores relatam o caso de um homem de 51 anos de idade que se apresentou à instituição com dor e inchaço no cotovelo esquerdo. O paciente tinha sete anos de história de investigação com

Palavras-chave:

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diagnóstico inconclusivo. As características da ressonância magnética (RM) mostraram uma massa expansiva com agressividade local. Devido a estas características, não foi possível descartar sarcoma de tecido mole no diagnóstico diferencial. Após a biópsia e uma reunião de equipe multidisciplinar, optou-se pela ressecção cirúrgica. O resultado anatomopatológico final confirmou o diagnóstico de LA. Mesmo que não seja uma neoplasia verdadeira, o LA pode causar muitos sintomas com comprometimento funcional da articulação afetada. É importante ter em mente este diagnóstico quando qualquer massa expansiva em torno de uma articulação for observada.

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Introduction

Lipoma arborescens (LA) is a rare noninfectious proliferative process of synovial joints, bursae and tendon sheaths. It is characterized by a hyperplastic proliferation of mature adipose cells, giving rise to a villous synovial proliferation. The term “arborescens” is because these fat cells substitute the subsynovial layers giving the “frond-like” or “tree-like” aspect of the synovium. The exact etiology of LA remains unknown, but it is likely to be a nonspecific response to joint injury and synovial inflammation, rather than a neoplasm.^{1,2}

LA is usually monoarticular and occurs most frequently in the knee, particularly in the suprapatellar recess. It rarely affects the elbow, with only a few cases reported in the literature.³⁻⁷ It shows a slightly predilection for males and can occur at any age, although it is more common after 40 year old.⁴ It may involve extra articular sites like synovial sheaths of tendon, bicipitoradial and subdeltoid bursae.

The aim of this study is to describe a case of LA in the elbow, presenting with features of a high grade tumor.

Case report

A 51-years-old male with complaints of swelling of the left elbow and forearm for almost seven years. He refers progressive pain and motor deficit of biceps, digital and wrist flexors. He had no past history of trauma or joint problems. Physical examination revealed swelling of proximal third of left forearm with discrete edema of left hand. Palpation of the swelling was painful.

Standard radiographs were normal. MRI of left elbow showed expansive solid mass in the antecubital fossa. The margins were partially defined, with fat proliferation in T1WI, high signal intensity in T2WI/STIR and heterogeneous enhancement post gadolinium (Fig. 1). It involved the supinator and pronator muscles and had close relationship with biceps tendon sheath, brachial vessels, and was close to median and radial nerves. It extended to the radial tuberosity showing cortical irregularities and intramedullary high signal intensity.

Along these seven years he underwent two biopsies with inconclusive results. Thus, a large core needle ultrasound-guided percutaneous biopsy was performed. The histological evaluation showed a benign and mature lipomatous process

fulfilling the subsynovial connective tissue, focally lined by synovial cells. There were scattered foci of chronic inflammatory cells, rendering the diagnosis of *Lipoma arborescens* (Fig. 2).

Because of these discordant findings (local aggressiveness on MRI and benign lesion on pathology) the case was discussed by a multidisciplinary team and surgical resection was defined for clarifying diagnosis.

At surgery, the lesion presented as soft mass with ill-defined contours, fibrosis, and adhered to neuromuscular bundles (Fig. 3). To resect the tumor, it was necessary to perform radial and median nerves neurolysis and ligature of some brachial branches, with no functional deficits.

Histologically, the specimen showed synovial tissue with a villous architecture. The stroma was replaced by multiple nodules of mature adipose tissue and scattered nodular lymphoid aggregates and fibrosis. The diagnosis of *Lipoma arborescens* was confirmed (Fig. 4).

Discussion

LA has also been called villous lipomatous proliferation of the synovial membrane to highlight its non-neoplastic nature.⁷ There is no report of malignant cells in the fat or synovial tissue of patients with LA.

The diagnosis is challenging, once it can mimic other articular masses (i.e. noninfectious synovial proliferative lesions, infectious granulomatous conditions, depositional joint diseases or articular masses of neoplastic and vascular origin). Synovial osteochondromatosis, pigmented villonodular synovitis (PVNS), rheumatoid arthritis, tuberculous arthritis and gouty arthropathy are the most common differential diagnoses.²

There are few reports regarding the imaging features of LA. Since the images correlate with the histopathology, MRI or CT can help to provide a conclusive diagnosis. The synovial lining of an affected joint or bursa demonstrates multiple villi of fat features on MRI and CT. These fatty villi protrude into the associated bursal or joint effusion.⁷ MRI is the modality of choice for diagnosis demonstrating villous tree-like architecture synovial mass, hyperintense on both T1WI and T2WI, without significant enhancement. On MRI, a chemical-shift artifact may be observed at the interface of the fatty villi with the adjacent fluid.

In the presented case, patient's lesion presented with local aggressiveness signs such as cortical destruction and apparent

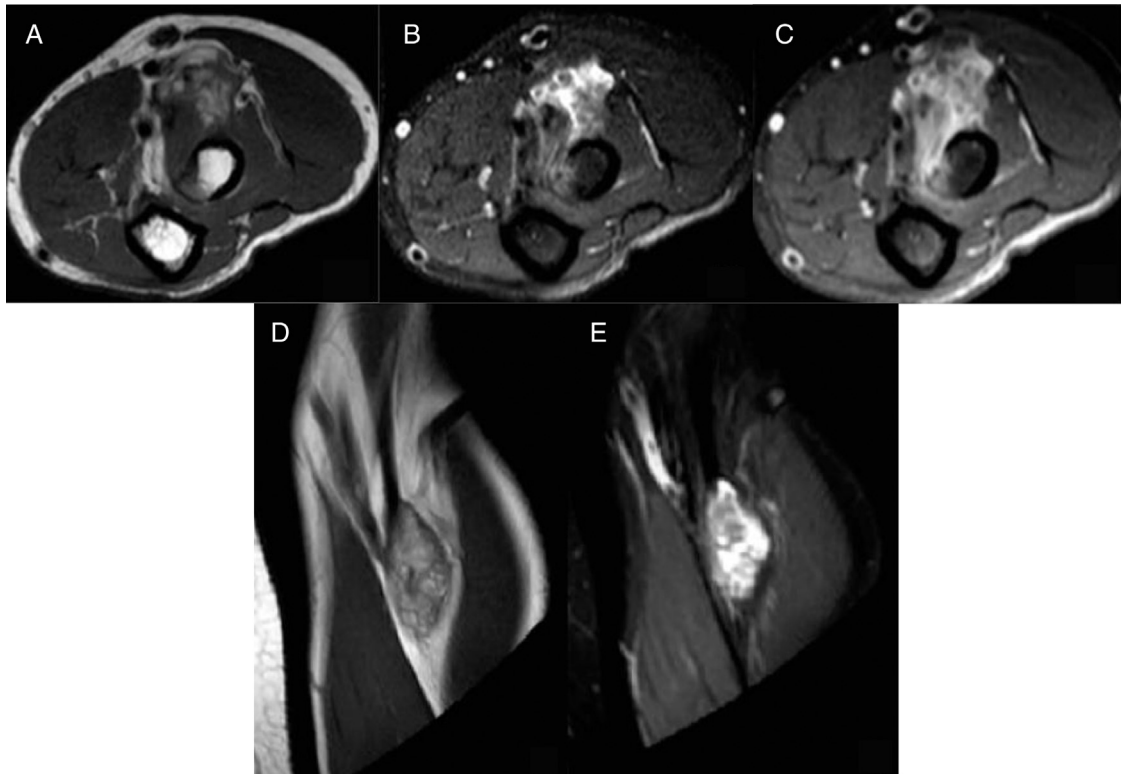


Fig. 1 – Magnetic resonance imaging of the elbow showed an ill-defined mass at the distal portion of the bicipital tendon associated with fat proliferation within the bicipitoradial bursa and erosion of the radio tuberosity with subtle edema of bone marrow. (A) Axial image FSE T1; (B) axial image T2 SPAIR; (C) axial T1 post contrast; (D) coronal image T1; (E) coronal image T2 SPAIR.

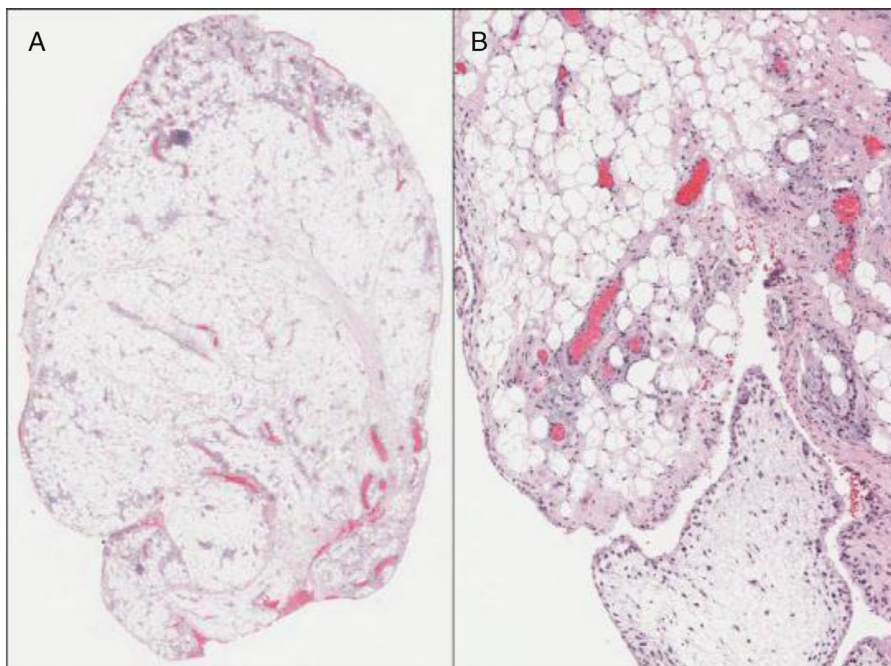


Fig. 2 – (A) Histologically, the biopsy showed well defined nodules of mature adipose tissue expanding the synovium; (B) the surface of the nodules was villous and covered by synoviocytes.

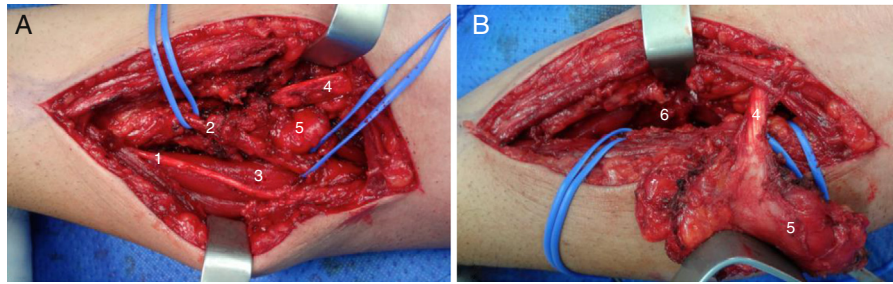


Fig. 3 – Intraoperative images before (A) and after (B) tumor dissection. 1, radial nerve; 2, brachial artery; 3, supinator muscle; 4, biceps brachii muscle tendon; 5, tumor; 6, tumor bed after resection.

infiltration of the adjacent structures, which made it difficult to differentiate from malignancy. As the pathologic evaluation of the surgical specimen showed no malignant cells, we suggest a mechanical degenerative process to justify these findings.

LA is typically observed at the synovial lining, however the bursa adjacent to a joint also can be affected. As an example, involvement of the subacromial-subdeltoid bursa of the shoulder has been reported in association with rotator cuff tears and bursitis.⁸

Despite osteoarthritis is not a cause for development of LA, many studies correlate LA with early onset of osteoarthritis of the affected joint. They suggest that repeated mechanical injury cause effusion and thickening of the proliferated synovium, which can lead to osteoarthritis. Depending on duration of symptoms, the degenerative changes can be worse and, for this reason, some authors postulated

surgical treatment for every patient in order to avoid this complication.⁹

The treatment of LA depends on the clinical manifestations. It is an indolent condition and does not require aggressive treatment. The standard treatment is an open or arthroscopic intervention with synovectomy and recurrence is uncommon. Surgery usually provides adequate relief of pain and swelling.¹ There are some reports of local injection of radionuclides called radiation synovectomy. Three radionuclides may be used: Yttrium-90 (Y-90 silicate/citrate), Rhenium-186 (Re-186 sulfide), and Erbium-169 (Er-169 citrate). Y-90 is often the radionuclide of choice and has an optimal penetration in the synovium.¹⁰

In conclusion, although LA is uncommon, it must be remembered in differential diagnosis of synovial masses, even if there are signal of local aggressiveness. MRI helps to differentiate LA from other articular lesions. Radiologists

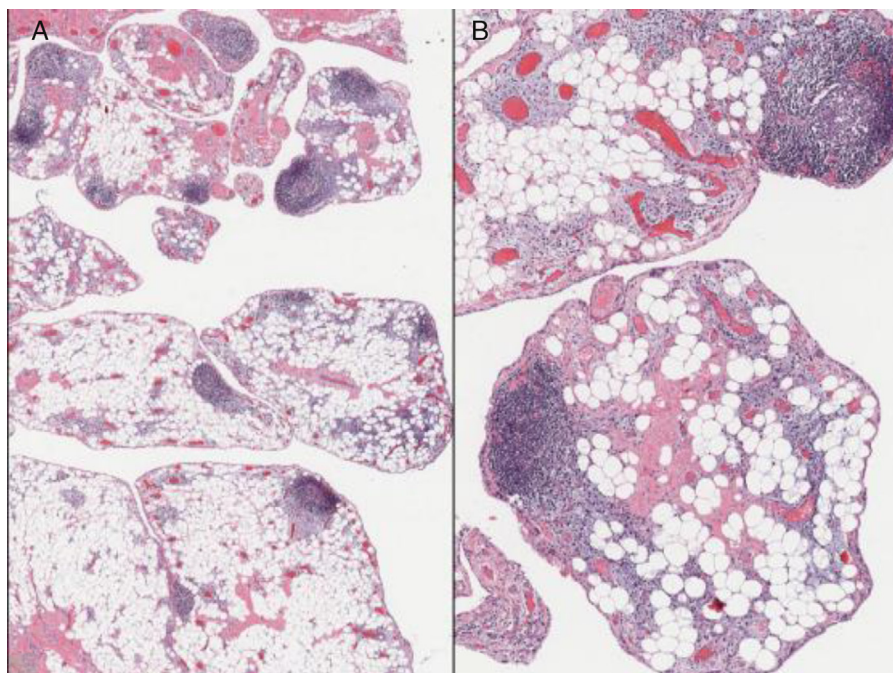


Fig. 4 – (A) The microscopic examination of the surgical specimen revealed a multilobulated lesion composed of adipose tissue nodules mixed with focal fibrosis and chronic inflammation; (B) the synovocytes at the surface of the nodules allowed the identification of a proliferative synovial lesion full of typical adipocytes within the stroma, confirming the diagnosis of Lipoma arborescens.

and orthopedics surgeons should be aware of its radiological features in order to recognize this condition and avoid misdiagnosis.

Conflict of interest

The authors declare no conflicts of interest.

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