

## Case report

## Lipoma arborescens of the bicipital bursa

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### ABSTRACT

Lipoma arborescens is a rare benign entity characterized by proliferation of villous fat tissue in subsynovial layer that usually affects the knee joint. We report a case of lipoma arborescens in bicipitoradial bursa of the elbow in a 44 year-old female patient. In spite of this rare location, radiographic findings by ultrasonography and magnetic resonance imaging made diagnosis possible.

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### Lipoma arborescente de la bursa bicipital

#### RESUMEN

El lipoma arborescente (LA) es una entidad benigna caracterizada por la proliferación de tejido graso de morfología vellosa en la capa subsinovial, que afecta habitualmente a la rodilla. A continuación se presenta un caso de LA en la bursa bicipitorradial del codo en una mujer de 44 años. A pesar de la rara localización de la lesión, los hallazgos radiológicos en la ecografía y la resonancia magnética permitieron el diagnóstico.

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## Introduction

Lipoma arborescens (LA) is a rare synovial process that consists in a hyperplastic proliferation of fatty tissue that replaces the subsynovial connective layer and forms villous proliferations associated with synovial effusion.<sup>1</sup> It typically affects the suprapatellar recess of the knee, although cases of LA have been described in other joints, tendon sheaths and synovial burasae.<sup>2-5</sup>

We present a case of LA in the bicipitoradial bursa of the elbow (a rare localization) in a 44-year-old woman. A review of the medical literature related to this entity is also reported.

## Case presentation

A 44-year-old woman presented a slowly growing (2 years of progression) mass on the anterior ulnar fossa of the left elbow.

She had no history of trauma, systemic, or joint disease in other localizations. The mass was soft and was not fixed to the skin but it was to underlying tissue. Overlying skin was normal in coloration and joint movement was slightly restricted when forearm pronosupination was attempted. The patient's hemogram was normal for the 3 cell series. Antinuclear antibodies and rheumatoid factor was not measured. Erythrocyte sedimentation rate was not determined because the sample coagulated.

The x-ray showed a soft-tissue mass in the anterior ulnar fossa, without evidence of osteoarthritis of the elbow. The echography showed a mass of mixed echotexture, with some zones of anechoic fluid and other hyperechogenic areas in which the presence of fat tissue was presumed (Figure 1). A magnetic resonance (MR) (General Electric, 1.5T) was carried out with a extremity surface coil and sagittal fast spin-echo (FSE) T2 sequences with fat suppression and FSE T1 with fat suppression after the administration of gadolinium contrast (with diethylenetriamino penta-acetic chelated gadolinium [Gd-DTPA]) was performed. A circumscribed mass was identified extending along the bicipitoradial bursa of the elbow and which enveloped the biceps tendon, with a heterogeneous signal from a

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fluid like component and foci of fat tissue which corresponded to a bursal effusion and fat tissue deposits similar to small polypoid lesions from the wall to the interior of the mass. After contrast was administered, an important reinforcement of the wall of the mass and its proliferations was evident (Figure 2).

The woman underwent a partial synovectomy and the extracted tissue was then analyzed, revealing the presence of villous proliferations composed by mature adipocytes covered by synovial membrane and chronic inflammatory infiltrates (Figure 3).

Currently and after 4 years of follow-up there has not been a recurrence of the lesion or joint manifestations elsewhere.

## Discussion

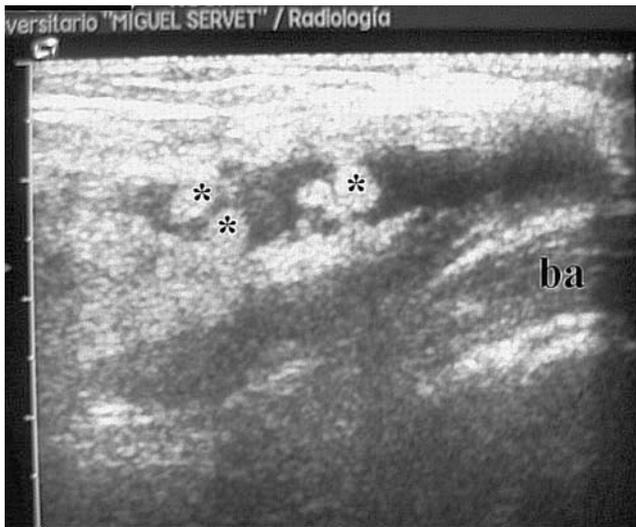
Hallel et al proposed the term "villous lypomatous proliferation of the synovial membrane" to reflect the histological characteristics of this process and its non-neoplastic nature.<sup>1</sup> Other authors have proposed the term "synovial lypomatosis," because the aspect of this tumor is not always villous.<sup>2</sup> It is usually a monoarticular problem unilaterally present on the knee, with predilection for the suprapatellar recess and which progresses with chronic progressive

and painless synovial effusions which can exacerbate when the synovial proliferations are trapped between the joint surfaces, leading to pain and limitation of movement.<sup>1,2,6-8</sup>

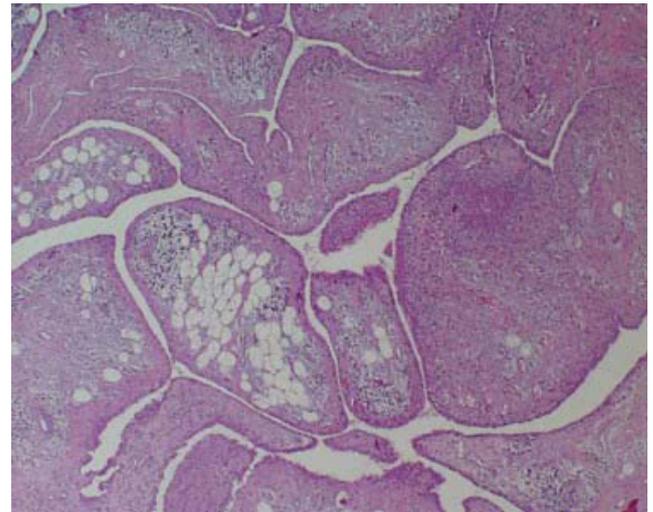
This lesion is more frequently described in males, between 40 and 60 years of age. Most of the cases respond to an intraarticular injection of steroids used to control exacerbations, although a cure depends on the arthroscopic or open removal synovectomy.<sup>6,9</sup> Laboratory studies are usually normal.<sup>10</sup>

The exact etiology of LA is unknown. Although some authors have related it to trauma,<sup>8,11</sup> it is believed that LA represents a non-specific response to chronic inflammation of the synovial membrane; this has also been associated to osteoarthritis,<sup>1,7,11</sup> rheumatoid arthritis,<sup>12</sup> gout,<sup>8</sup> psoriatic arthritis, and diabetes mellitus.<sup>7</sup> In addition, some authors state that LA could contribute to the development of osteoarthritis.<sup>1,2,13</sup> However, many of the patients do not have any type of osteoarticular process and it is not clear if these associations are purely casual.<sup>2</sup>

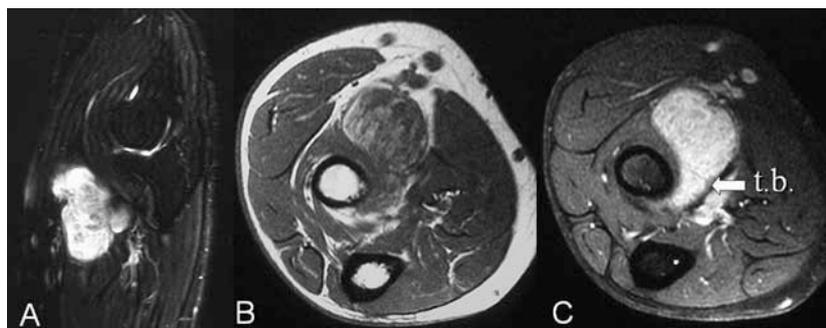
The number of series that describe subjects with LA in any localization is very small<sup>18</sup> and most of the publications refer to sporadic cases. Localization of LA in the bicipitoradial bursa is very rare and only 5 cases of elbow LA can be found (Medline); in all cases. Its origin probably took place in the bicipitoradial bursa,<sup>4,9,12,14,15</sup> one



**Figure 1.** Echography. Longitudinal image of the anterior elbow fossa. A mixed echotexture mass with a anechoic liquid content and hyperechoic regions emanating from its walls as villous structures can be seen (\*). The lesion is in the typical localization of the bicipitoradial bursa, over the insertion of the anterior brachial muscle (ba).



**Figure 3.** Fotomicrograph. The histological study shows hyperplasia of the fatty tissue that comes into contact with the synoviocyte envelope. Mature fat cells and proliferative villous projections replace the synovial tissue. The villous projections are covered by a layer of adipose tissue and dilated capillary vessels and accompanied by moderate lymphocyte and plasma cell infiltration.



**Figure 2.** Magnetic resonance. Mass which partially envelops the distal portion of the bicipital tendon (t.b.) in which isointense villous fat proliferation with a signal of subcutaneous fat tissue. The orientation of the sagittal image is approximately equivalent to the echographic image seen in Figure 1. A) Sagittal image FSE T2 with fat suppression. B) Axial FSE T1 image. C) Axial FSE T1 image with contrast. FSE indicates fast spin-echo.

of them lacked histological confirmation,<sup>12</sup> and only one case was bilateral.<sup>9</sup> The cause of this inflammatory process originating in the bicipitoradial bursa instead of the synovial elbow joint is not known. Some authors have proposed the hypothesis that repeated friction of the bursa due to forced pronation of the forearm is causative of inflammation of the bursa in this area; therefore, the bursa is compressed between the biceps tendon and the radial cortex.<sup>9</sup>

MR allows for the correct diagnosis of bicipital bursa LA when 3 signs are identified (as in the case we present): a) a process characterized by a synovial effusion originating in the bicipitoradial bursa of the elbow, which partially envelops the biceps tendon between this and the radial head; b) fat deposits with a signal intensity which is identical to that of subcutaneous fat in all of the pulse sequences, including the fat signal suppression with selective saturation techniques; and c) a tree-like architecture which corresponds to villous proliferations of the synovial membrane. In addition an artifact can also occur due to chemical displacement in the interphase between the fat tissue and the adjacent synovial fluid.<sup>9</sup> Soler et al described in a series of 13 cases of knee LA, 3 different types of morphological patterns of presentation of LA in MR, such as multiple villous synovial proliferations, a single, tree-like subsynovial mass and a mixed pattern.<sup>8</sup>

Very few studies have focused on the behavior of LA in MR with intravenous contrast. In this case, as in others of bicipitoradial bursa LA studied with contrast, a reinforcement within the lesion has been observed.<sup>15</sup> These findings contrast with those of another study which reflected the lack of reinforcement in one case of knee LA and led to the consideration that it is not necessary to find contrast reinforcement in LA.<sup>7</sup> However, in a recent study, Ragab et al presented 2 cases of knee LA associated to synovitis which had a prominent reinforcement with Gd-DTPA, indicating that it was an undifferentiated form of inflammatory synovitis.<sup>16</sup> The degree of reinforcement of the lesion seen here, in spite of the fact that it was not quantified in a dynamic study, could point to this possibility vs. a mechanical origin suggested by other authors in this localization.<sup>9</sup>

A differential diagnosis must be carried out with other synovial processes with a fatty tissue component such as synovial lipoma<sup>17</sup> and synovial osteochondromatosis (SO), in addition to liposarcoma. Synovial lipoma is very rare and it is usually a single circumscribed mass, of a round or oval morphology, with the same signal intensity as fat tissue but which lacks the tree-like aspect of LA. Osteochondral bodies in SO present a low peripheral signal due to calcification and are visible in the radiological studies.<sup>18</sup> The presence of a heterogeneous mass with fat tissue-like signal areas, in addition to the intense reinforcement upon administration of contrast, (as in

this case), can lead to an erroneous diagnosis of liposarcoma if the localization of the process is not known to be in the bicipitoradial bursa and the tree-like morphology of fat tissue is not recognized.<sup>4</sup> Other synovial processes, such as hemangioma, rheumatoid synovitis, and pigmented villonodular synovitis present different signal characteristics.<sup>18</sup>

In summary, LA is an infrequent synovial alteration that has very characteristic signs when seen with MR. Recognizing the origin in the synovial bursa along with the presence of fat and the tree-like morphology of the synovial projections allowed for the correct diagnosis of this non-neoplastic mass in the anterior ulnar fossa, in spite of the exceptional localization.

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