

## An unusual case of lipoma arborescens

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### ABSTRACT

**INTRODUCTION** Lipoma arborescens is a rare condition of the synovial lining. It is particularly uncommon in the bicipitoradial bursa of the elbow.

**CASE REPORT** A 68-year-old woman presented with a 5-month history of anterior elbow pain and swelling causing discomfort. Radiography demonstrated reactive changes of radial tuberosity and magnetic resonance imaging confirmed lipoma arborescens of the bicipitoradial bursa with distal biceps tendinopathy. A bicipital bursa bursectomy and lipoma excision was performed. Gross pathology and histology was consistent with lipoma arborescens. Three months postoperatively, our patient had full range of motion and good strength.

**CONCLUSIONS** To our knowledge, this is the first published case report of lipoma arborescens affecting the elbow. Recognising the differential diagnoses of anterior elbow pain and the characteristic imaging is essential for accurate diagnosis.

### KEYWORDS

Bicipitoradial bursa – Elbow – Histology – Lipoma arborescens – Magnetic resonance imaging

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Lipoma arborescens (also known as diffuse articular lipomatosis) is a rare benign articular lesion comprising mature adipose cell proliferation in the subsynovial region with a predilection to the suprapatellar bursa. The exact aetiology remains unknown, the main hypothesis being a response to chronic inflammatory or traumatic stimuli.<sup>1</sup>

Lipoma arborescens rarely affects the elbow; based on our MEDLINE® and Embase™ search, only a few cases have been described to date. Reports involving the bicipitoradial bursa included a radiological description but none have reported a combination of gross pathology, histology and imaging. We describe a case of lipoma arborescens with chronic bicipitoradial bursitis and distal biceps tendinopathy, illustrated by gross pathology, histology and preoperative imaging. We also discuss the differential diagnoses of anterior elbow pain and radiological differentials of synovial swelling in the elbow.

### Case history

A 68-year-old woman presented with a 5-month history of anterior elbow pain and swelling. The swelling was located anteriorly at the distal boundary of the antecubital fossa. On palpation, the lump was tender with sensory symptoms along the median nerve distribution in the hand. A hook test of the distal biceps was normal but painful. However, an active hook test was positive with pain on resisted flexion/

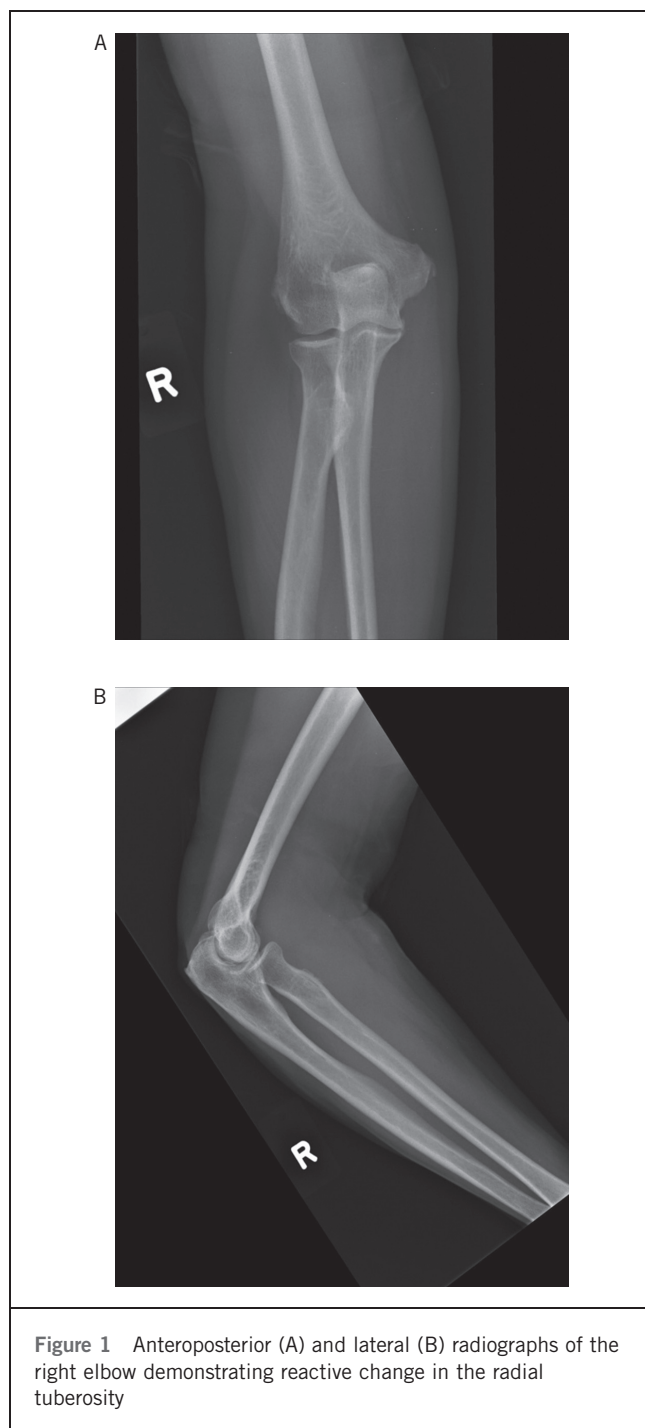
supination testing. Initial radiography demonstrated reactive change of the radial tuberosity (Fig 1). All blood tests were normal.

Magnetic resonance imaging showed an unusual cystic swelling in the right bicipitoradial bursa with peripheral frond-like and ovoid fatty components. There was thickening and intermediate signal intensity in the distal biceps tendon insertion and hypertrophy of the bicipital radial tuberosity with some associated oedema (Fig 2). Postcontrast peripheral enhancement of the wall lining was present, indicative of chronic bicipitoradial bursitis. These appearances were characteristic of chronic bicipitoradial bursitis with lipoma arborescens and distal biceps tendinopathy.

A bicipitoradial bursa bursectomy and lipoma excision under general anaesthesia was performed. An incision was made in the antecubital fossa. The large bursa was resected, the lipoma excised (Fig 3) and a partial rupture to the distal biceps tendon was debrided but not repaired.

Haematoxylin and eosin staining revealed sheets of mature adipose tissue with some interspersed fibrous septae (Fig 4), in keeping with lipoma arborescens. Additional findings included: small, benign (reactive) lymph nodes; benign, mildly hyperplastic synovial tissue; and some patchy, mild, chronic lymphocytic inflammation with no evidence of malignancy.

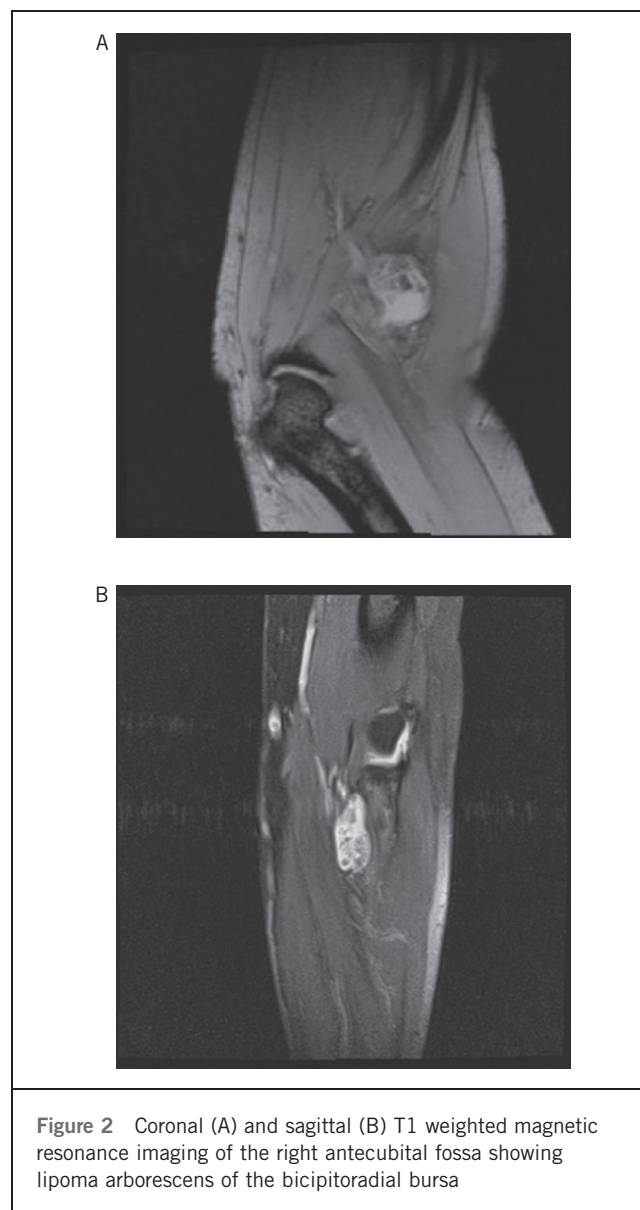
At the final follow-up visit, six months after surgery, the patient had full range of motion and good strength with



satisfactory functional outcome. There was occasional aching around the anterior aspect of the elbow.

## Discussion

Lipoma arborescens is a rare condition of the synovial lining of bursae, joints and tendon sheaths. It is most commonly reported in the knee joint and lower limb, and less



commonly in the shoulder, elbow, hip, ankle and wrist joints.<sup>1</sup> The case reported here illustrates a rare clinical presentation of anterior elbow pain associated with clinical features of distal biceps tendon irritation.

There are two main types of lipoma arborescens: primary and secondary. The more common secondary type is associated with chronic irritation, osteoarthritis, diabetes mellitus, rheumatoid arthritis, synovitis and meniscal injury. The less common primary type is idiopathic and occurs in younger patients in the first two decades of life. Lipoma arborescens is more prevalent in the male population and has been reported in patients from 9 to 66 years.<sup>2</sup>

The most common presenting complaint is painless joint swelling over a long period of time. Typically, it presents in a monoarticular fashion but bilateral cases have been reported. Laboratory tests including rheumatoid factor, uric

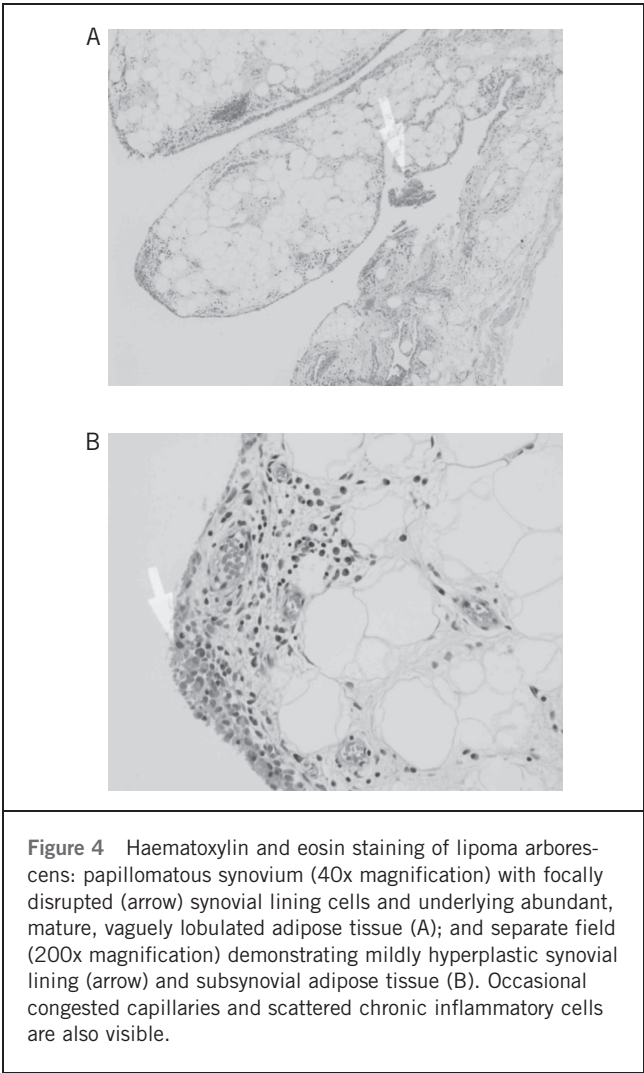
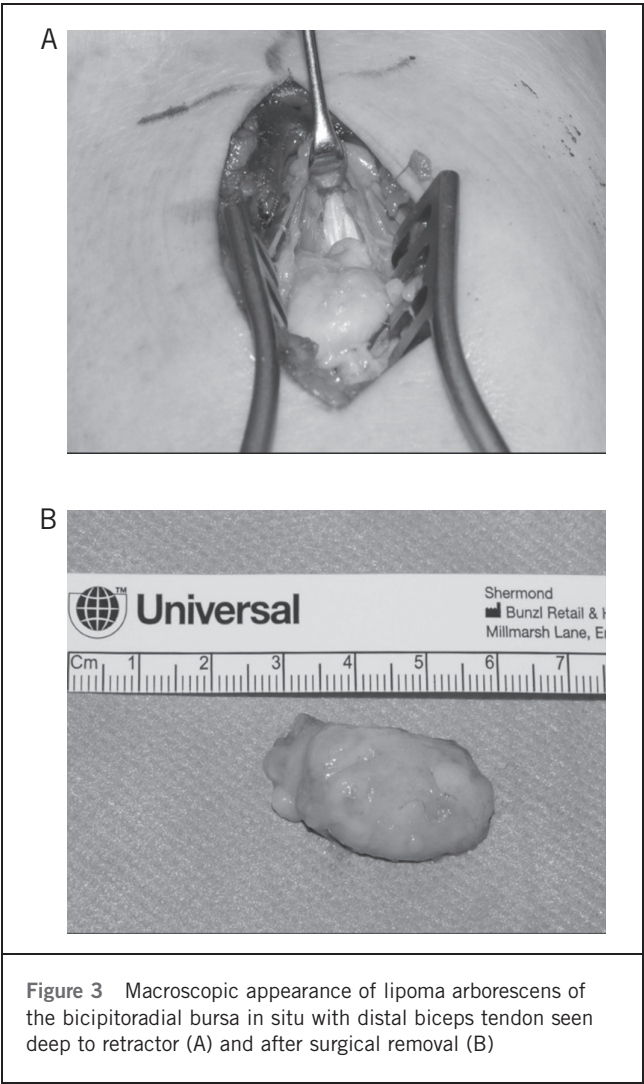


Table 1 Magnetic resonance imaging features that help distinguish lipoma arborescens from other intra-articular synovial lesions (adapted from Kamran <i>et al</i> , Sheldon <i>et al</i> and Murphey <i>et al</i> ) <sup>1,3,5</sup>	
Differential diagnoses	Characteristic features
Synovial lipoma	Lack of: villous fronds, villous proliferation and fatty replacement of underlying connective tissue
Pigmented villonodular synovitis	Diffuse low intensity signals on T1 and T2 imaging
Synovial chondromatosis	Variable signal intensity from cartilage
Synovial haemangioma	Lobulated intra-articular mass with intermediate signal on T1 imaging and hyperintensity on T2 imaging, reflecting blood pooling
Rheumatoid arthritis	Synovial proliferation with fibrosis with intermediate intensity on T1 and T2 imaging
Lipoma arborescens	Synovial fronds with fat signals on all sequences, joint effusion and absence of magnetic susceptibility effects of haemosiderin. Absence of enhancement on intravenous administration of contrast.

acid levels and erythrocyte sedimentation rate are normal in this condition, as is the joint aspirate. Pain may also be present and can affect the range of motion, as in our patient. Intermittent pain may be caused by the trapping of the hypertrophied villi in the articulating surfaces of the joint.<sup>5</sup>

Important differential diagnoses to be considered in patients presenting with anterior elbow pain are distal biceps tendinopathy, partial thickness tears of the distal biceps tendon, pronator syndromes, brachialis tendinitis and compression of the lateral antebrachial cutaneous nerve. Normal radiography is seen in the condition, with magnetic resonance imaging being the most sensitive modality, indicating the pathognomonic findings of frond-like synovial proliferation with signal intensity similar to that of subcutaneous adipose tissue on all sequences and joint effusion.<sup>4</sup> These characteristic features help to exclude other intra-articular synovial lesions such as rheumatoid arthritis, focal synovial lipoma, pigmented villonodular synovitis, synovial chondromatosis and synovial haemangioma (Table 1).<sup>1,3,5</sup>

Anatomically, the bicipital bursa lies between the biceps tendon and radial cortex, with the superficial and deep radial nerve as nearby structures, making these susceptible to compression when the bursa is inflamed and distended. With greater distension, the median nerve can also be affected, as in our patient. In supination, the bicipital bursa completely surrounds the biceps tendon whereas in pronation, the bursa is compressed between the biceps tendon and radius. This positioning of the bursa causes increased pressure, and that forceful pronation and mechanical trauma can create bicipitoradial bursitis.<sup>1</sup> In our case, the hypertrophied radial tuberosity may also have contributed to increased microtrauma in the region from raised pressures, leading to lipoma arborescens in the bicipitoradial bursa.<sup>6</sup>

Lipoma arborescens does not appear to resolve over time and we recommend excision with synovectomy. In our patient, excision of the lipoma in addition to the bursectomy resulted in symptomatic improvement of the associated distal biceps tendinopathy and a good functional outcome.

## Conclusions

To our knowledge, this is the first published case report of lipoma arborescens involving the bicipitoradial bursa in the elbow illustrated by gross pathology, histology and imaging. Recognising the differential diagnoses of anterior elbow pain and the characteristic imaging is essential for accurate diagnosis. If the lipoma arborescens is localised to the bicipitoradial bursa, we advocate excision of the lipoma and a bursectomy.

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