CASE REPORT

Unusual case of lipoma arborescens in the subacromial-subdeltoid bursa

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SUMMARY

A 38-year-old female presented with a 10-month history of right shoulder pain with impingement symptoms. She was diagnosed on magnetic resonance (MR) imaging to have supraspinatus tendon tear and degenerative changes contributing to subacromial impingement. She also had lipoma arborescens of the subacromial-subdeltoid bursa, an uncommon condition in a particularly rare location. Lipoma arborescens is a benign intra-articular condition characterized by lipomatous proliferation of synovium with replacement of subsynovial tissue by mature adipocytes. It is typically a monoarticular process affecting the knee. Due to the presence of pathognomonic fat, diagnosis is usually straightforward with MR as the preferred imaging modality.

CLINICAL PRESENTATION

Our patient was a 38-year-old Chinese female who presented with a 10-month history of right shoulder pain. The patient reported minor trauma two decades prior when she fell and hit her right shoulder. She was otherwise healthy, with no significant medical history. On physical examination, there was tenderness localized to the anterior right shoulder in the region of the greater tuberosity. Her range of motion was almost full except for slight limitation of internal rotation. Impingement test was positive. Speed's test was negative.

Shoulder radiographs revealed small bony spurs on the acromion process and greater tuberosity of the humerus. Initial impression was that of impingement syndrome with supraspinatus tear. The patient underwent physiotherapy for six weeks, but had no pain relief.

MR arthrogram of the right shoulder was subsequently performed. The scan demonstrated a partial-thickness bursal tear of the supraspinatus tendon. In addition, the subacromial-subdeltoid bursa (SASD) was fluid-distended, and contained nodular projections that showed isointensity with subcutaneous fat on all pulse sequences (Figure 1). Osteophytes were seen at the greater tuberosity and lateral aspect of the acromion. Findings were compatible with lipoma arborescens of the SASD with rotator cuff tear on a background of subacromial impingement.

TREATMENT

In view of persistent pain, the patient was scheduled for arthroscopic surgery of the right shoulder. On arthroscopy, the glenohumeral joint appeared normal. Proliferative fern-like bursa that appeared lipomatous was seen under the acromioclavicular joint and in the subdeltoid space (Figure 2). The bursal-sided, partial-thickness tear of the supraspinatus tendon, located adjacent to the acromial spur, was confirmed. Excision of all proliferative bursa and lipomatous tissue was performed, followed by removal of bony spur and repair of supraspinatus tear. Histology of the lipomatous tissue revealed villous tissue infiltrated by mature adipocytes with its surface covered by normal synovium, confirming the diagnosis of lipoma arborescens.

The convalescent phase was uneventful; the patient achieved full range of motion in the affected shoulder five months after surgery.

DISCUSSION

Although the exact pathophysiology is unknown, lipoma arborescens is believed to be a benign reactive process secondary to chronic synovial inflammation. There is no known malignant transformation. This rare condition has been associated with degenerative arthropathy, rheumatoid arthritis and previous injury.[1]

The typical presentation is a monoarticular disease affecting the knee, with a predilection for the suprapatellar pouch. However, bilateral or polyarticular involvements have been described. Involvement of the SASD as in our case is exceedingly rare, with less than ten cases reported in the literature.

Although reports suggest an association between lipoma arborescens and rotator cuff tears, the causal relationship between the two entities remains to be established. It is uncertain if the SASD lipoma arborescens was initially present in our patient, causing bony spurs that ultimately led to rotator cuff tear or if chronic inflammation and repetitive bone-to-bone abrasions following rotator cuff tears predisposed to lipomatous synovial proliferation.[2]

MR is the key modality to diagnosis, demonstrating lobulated frond-like masses with signal intensity mirroring fat on all sequences, and decreased signal intensity following fat suppression. Enhancement may be seen in regions of inflamed synovium. Associated joint effusion is common.[1,2]

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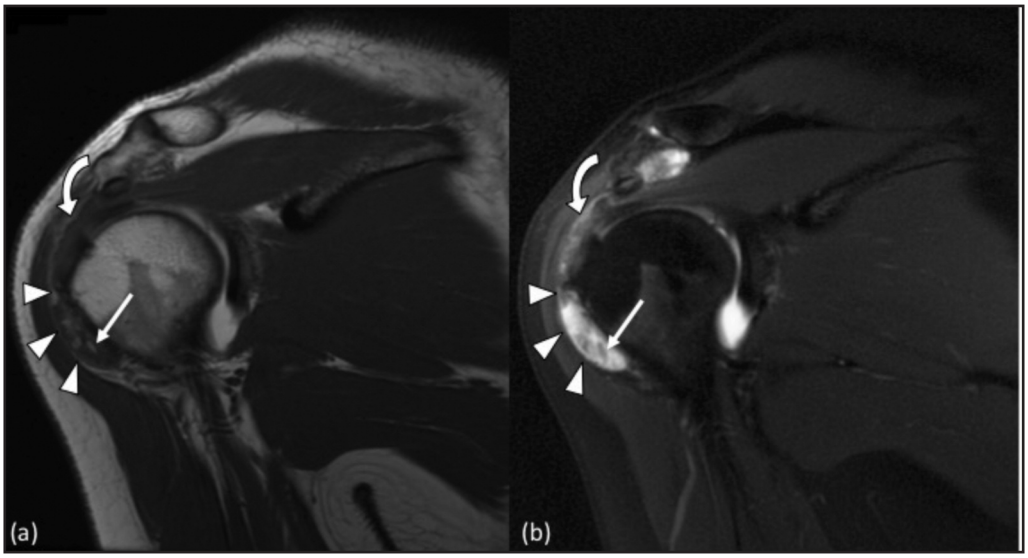

Fig. 1: Coronal MR arthrogram images of the right shoulder. T1-weighted image (a) shows a bulky subacromial-subdeltoid bursa (arrow heads) containing multiple nodular frond-like projections with high signal intensity mirroring subcutaneous fat (straight arrow). The frond-like projections show low signal intensity (straight arrow) within the fluid distended bursa (arrow heads) in the fat-suppressed T2-weighted image (b). Bursal surface partial-thickness tear of the supraspinatus tendon (curved arrows) and bony spurs involving the greater tuberosity and acromion are also noted in both images.

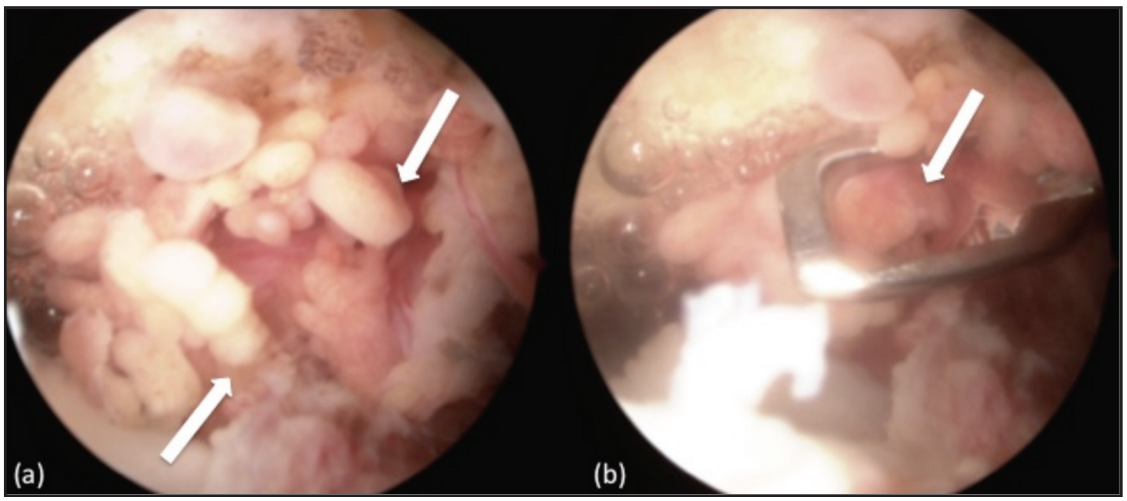

Fig. 2: Arthroscopic views of the subacromial - subdeltoid space. Lipomatous and villous-looking projections (straight arrows) were seen under the acromioclavicular joint (a) and in the subdeltoid space (b) as shown. Biopsy was taken, which subsequently confirmed the diagnosis of lipoma arborescens.

Whilst rare, lipoma arborescens should always be considered. Radiographs and computed tomography are not useful. Rarely, radiolucent areas representing fat may be appreciated within the joint space on radiographs. No appreciable radiolucency in the expected region of the SASD was detected in our case.

Ultrasound, although not diagnostic, demonstrates suggestive features of an avascular multilobulated hypoechoic mass arising from the synovium, surrounded by anechoic joint fluid.

Several intra-articular diseases that can mimic lipoma arborescens include synovial chondromatosis, synovial haemangioma and pigmented villonodular synovitis.

Synovial chondromatosis is a benign neoplasm resulting in synovial membrane proliferation with formation of intra-articular loose bodies. Calcification is absent in 15% of cases, causing this disease to be radiologically occult or only demonstrating subtle erosions. The loose bodies show variable MR signal intensity, depending on their cartilaginous or osseous contents. Non-osseous bodies tend to demonstrate chondroid signal characteristics in the form of low-to-intermediate signal intensity on T1-weighted (T1w) sequences and high signal intensity on T2-weighted (T2w) sequences.[3]

Synovial haemangioma is a rare benign vascular malformation occurring most commonly in the knee. The lesion is isointense to skeletal muscle with inhomogenous but

marked hyperintense signal intensity on fluid-sensitive sequences due to pooling of blood within vascular spaces. Marked enhancement corresponding to areas of T2w hyperintensity is typical.[4]

Pigmented villonodular synovitis is a benign proliferative process of the synovium, which can present as a focal nodular mass or diffusely within the joint. The lesion demonstrates low-to-intermediate signal intensities on both T1w and T2w sequences. Characteristic "blooming" artifact on gradient-echo imaging and hypointense signal changes in all sequences may be seen in the presence of haemosiderin-laden nodules.[5]

Laboratory tests are usually unremarkable. Joint aspiration shows absence of any cells or crystals.

On gross pathology, the lesion appears fatty with frond-like margins. Microscopic features include papillary proliferation of synovial villi and replacement of subsynovial tissue by mature adipocytes.[2]

Synovectomy has been widely suggested as the definitive management for lipoma arborescens, although occasional recurrence has been reported.

In conclusion, lipoma arborescens is an uncommon condition that can occur in rare locations. Whether it be the cause of a patient's problem or simply secondary or incidental to it, lipoma arborescens should always be a consideration.

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