

Bilateral Shoulder Pain

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PART A

A 63-year-old male patient presented in the outpatient Orthopaedic Clinic with longstanding pain of both shoulders, more intense at night and at lying on the side. On clinical

examination there was restricted movement, pain and weakness when lifting and crepitus sensation in various movements. MR imaging is shown below (**Fig. 1-4**).



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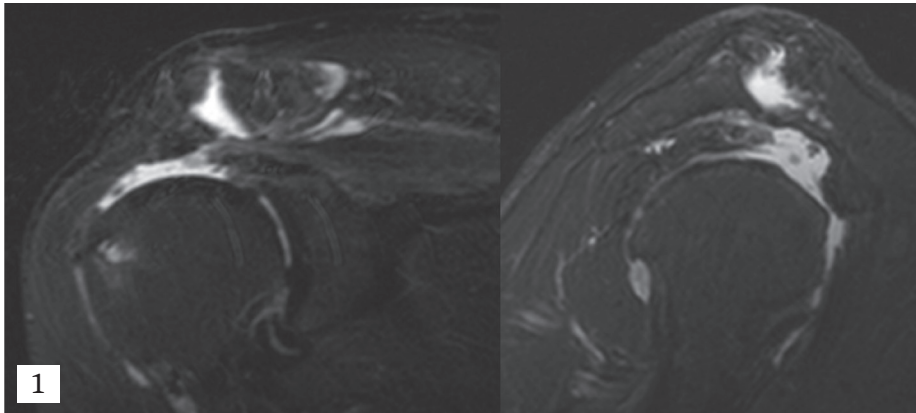


Fig. 1. MR imaging, right shoulder. Fat suppressed oblique mid-coronal (left) and oblique sagittal (right) STIR

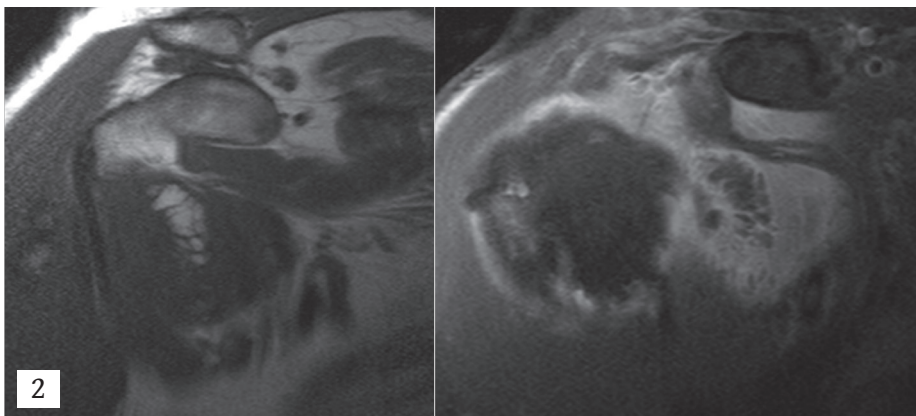


Fig. 2. MR imaging, right shoulder. Oblique anterior coronal T1W (left) and fat suppressed contrast enhanced T1W (right)

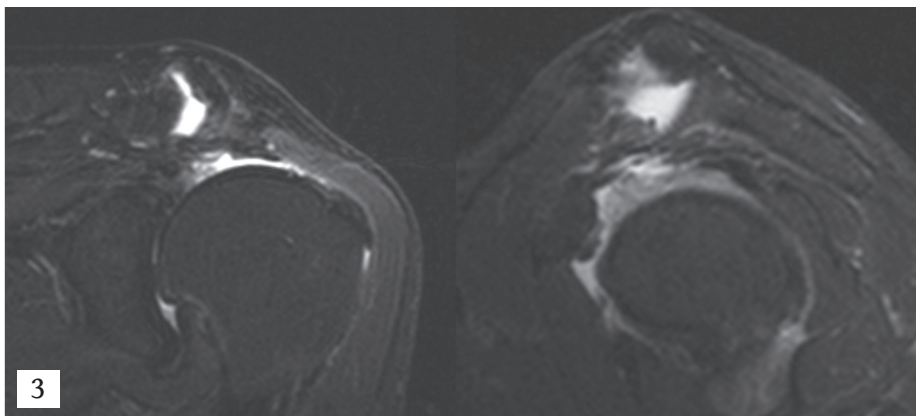


Fig. 3. MR imaging, left shoulder. Fat suppressed oblique mid-coronal (left) and oblique sagittal (right) STIR

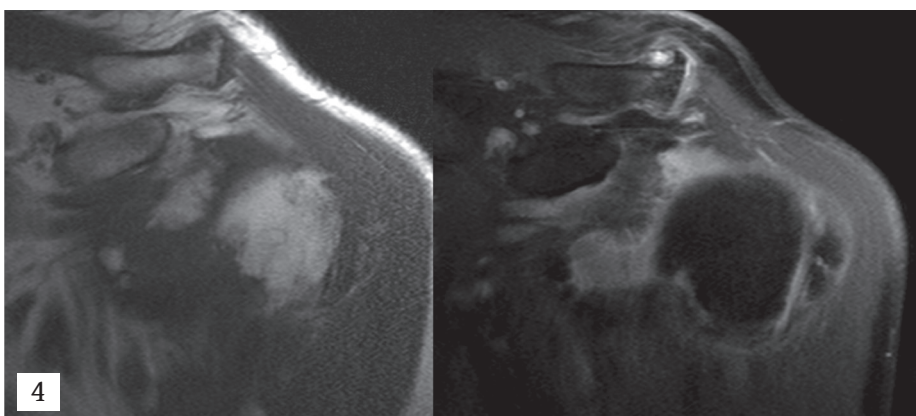


Fig. 4. MR imaging, left shoulder. Oblique anterior coronal T1W (left) and fat suppressed contrast enhanced T1W (right)

PART B

Diagnosis: Bilateral supraspinatus full thickness tear, “geyser” sign and lipoma arborescens

The MR imaging diagnosis of full thickness tear of the supraspinatus tendons (SSt) is straightforward with the presence of a gap filling the space between the subacromial bursa and the articular surface. The tendon is usually retracted and the distance between the humeral head and the acromion is reduced. However, the geyser sign (GS) and the lipoma arborescens (LA) are not often seen on MR imaging examinations of the shoulder and bilateral location is extremely rare.

The GS is a rare imaging finding that was originally described on conventional fluoroscopy-guided shoulder arthrography. Plain films are non diagnostic but may show decreased distance between the humeral head and the acromion, suggesting SSt tear. MR imaging offers the ability to recognise the presence of the GS on both conventional and arthrographic images. A full-thickness SSt tear may be associated with communication between the glenohumeral and acromioclavicular joint (ACJ). Thus, synovial fluid or intra-articular contrast extravasates from the glenohumeral joint into the subacromial bursa and subsequently into the ACJ. An overlying cystic mass may eventually develop and is said to resemble a “geyser” spouting upwards. However, our case is reported in early stages before the final formation of a synovial cyst [1].

When the tear occurs, there is loss of supraspinatus function and the humeral head migrates into a more superior position, which in the long term erodes the inferior capsule of the ACJ. Fluid is restricted into the ACJ by a valve-like mechanism and is gradually increased in volume [2]. Another causing factor for the GS is the reduced stability and increased mobility of the glenohumeral joint from the limited function of the rotator cuff.

The method of choice for the diagnosis of GS is MR imaging, showing gleno-humeral joint effusion extend-

ing into the subacromial-subdeltoid bursa and the ACJ, through a complete rotator cuff tear (Fig. 1-4). Moreover, fluoroscopic arthrographic findings could show an extravasation of contrast from the glenohumeral joint into the subacromial-subdeltoid bursa, extending into the subcutaneous tissue. Ultrasound is also able to detect the fluid into the ACJ extending through a complete tendon tear [2]. LA has been described as a rare, benign, usually monoarticular joint disorder, where proliferation of the synovium and synovial replacement with mature fat cells occurs [3]. The characteristic arborescent, villous projection of this fatty tissue is responsible for its name. Typically, patients with LA present with chronic, slowly progressive, usually painless swelling of the affected joint, associated with restricted motion, recurrent joint effusion, locking or intermittent pain, or they may even be asymptomatic [3-5].

On clinical examination there is mostly swelling regardless of its location. Comorbidities with LA have been reported, such as previous joint injuries, rheumatoid arthritis, osteoarthritis, psoriatic arthritis and diabetes mellitus [3].

In the majority of cases, LA is located unilaterally in the knee joint, particularly the suprapatellar bursa [4]. It can be less frequently found in other joints, such as in the shoulder, elbow, wrist, hip and ankle [6]. Polyarticular involvement is rare. The first case of bilateral shoulder LA was reported in 2006 [7]. No correlation in age and sex is found in literature [3]. On ultrasonography, echogenic villous, frond-like, proliferations in a bursa or joint usually with no vascularity on colour Doppler US are findings consistent with LA [8]. MR imaging is the method of choice to confirm the fatty nature of the synovial proliferation and the typical frond-like morphology showing increased signal on T1W, suppressed signal on fat suppressed sequences and synovitis on contrast enhanced sequences [4, 6].

In our case, plain and contrast-enhanced MR im-



KEY WORDS

Geyser sign; lipoma arborescens; shoulder/tendinopathy; MR imaging/diagnosis

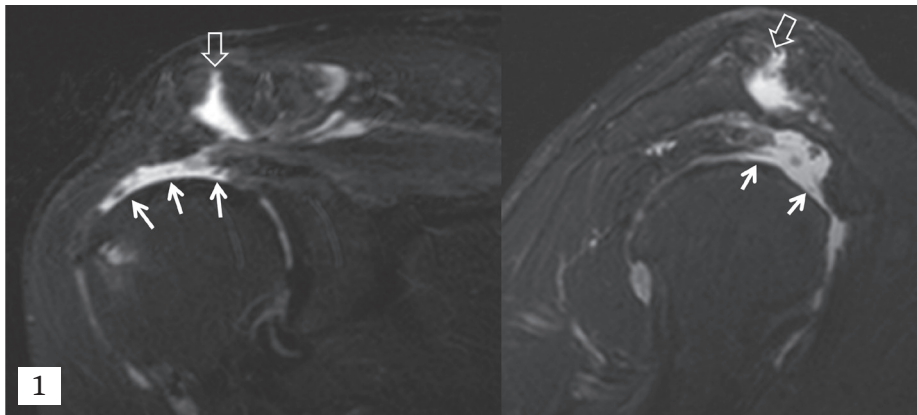


Fig. 1. MR imaging, right shoulder. Fat suppressed oblique mid-coronal (left) and oblique sagittal (right) STIR. There is a full thickness grade II tear of the supraspinatus tendon (arrows) and extension of the fluid into the acromioclavicular joint (open arrow)

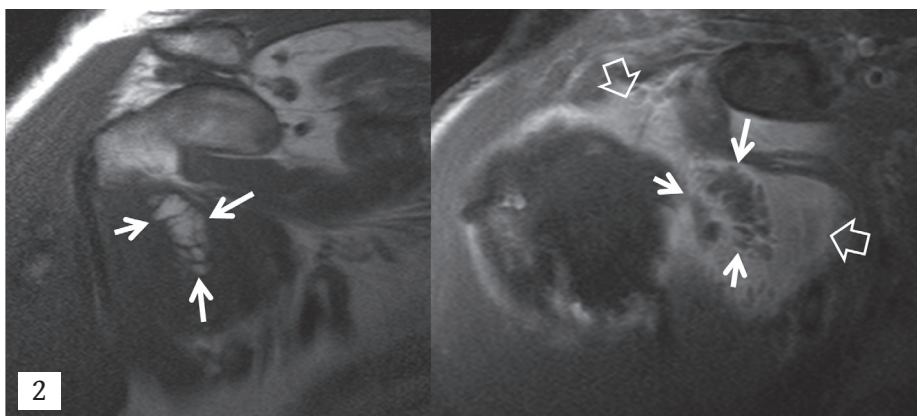


Fig.2. MR imaging, right shoulder. Oblique anterior coronal T1W (left) and fat suppressed contrast enhanced T1W (right) MR images. A fatty villonodular intra-articular lesion (arrows) and synovitis (open arrows) are shown

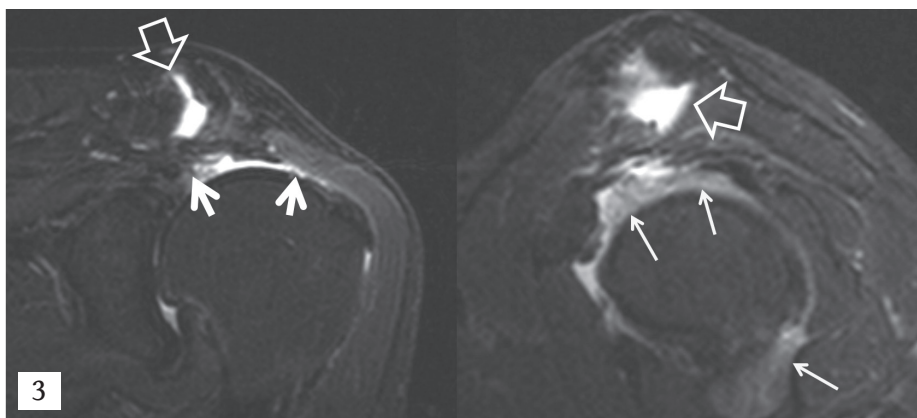


Fig. 3. MR imaging, left shoulder. Fat suppressed oblique mid-coronal (left) and oblique sagittal (right) STIR. There is a full thickness grade II tear of the SSt (arrows), extension of the fluid into the ACJ (open arrows) and synovial thickening (thin arrows)

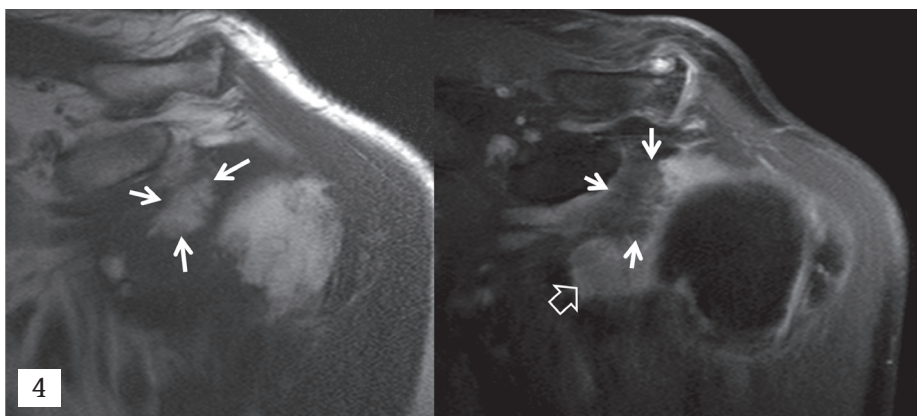


Fig.4. MR imaging, left shoulder. Oblique anterior coronal T1W (left) and fat suppressed contrast enhanced T1W (right) MR images. A fatty villonodular intra-articular lesion (arrows) and synovitis (open arrow) are shown

aging showed in both shoulders full thickness tear of the SSt, extension of intraarticular fluid into the ACJ as demonstrated with the GS and LA (Fig. 1-4). Coexistence of all the above in both shoulders is extremely rare and, to the best of our knowledge, has never been described before. Both GS and LA may be confused with other disorders, such as rheumatoid arthritis, pigmented villonodular synovitis, synovial lipoma, synovial ACJ cyst and CPPD. Thus, imaging plays a profound role in the differential diagnosis and contributes to treatment

planning. In our patient, LA and tendon tear with free communication between the glenohumeral and the ACJ were confirmed at surgery. Open surgery was performed bilaterally within 3 weeks apart including repair of the tendons because there was no fatty atrophy of the rotator cuff muscles and synovectomy with removal of the LA [9, 10]. **R**

Conflict of interest:

The authors declared no conflicts of interest.

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