Case study

I-MED Radiology Network

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Investigating shoulder injuries

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Ultrasound and MRI can be complementary tests when imaging superficial shoulder structures such as the rotator cuff, subdeltoid bursa and biceps tendon. Rotator cuff tears commonly involve the supraspinatus tendon, and are seen on MRI as a fluid-filled defect within a normally black tendon. Subdeltoid bursitis is seen as fluid interposed between the deltoid and the rotator cuff.

MRI has the advantage over ultrasound when it comes to looking for deeper, intra-articular causes of shoulder pain. MRI provides great detail of many processes which may not be visible with other forms of imaging, including labral tears, paralabral cysts, intra-articular loose bodies, chondral damage, capsulo-ligamentous injuries and subtle Hill-Sachs lesions and other fractures.

The shoulder is a very mobile joint, with a large range of movement. The trade-off is that it is also potentially unstable. The fibrocartilagenous labrum deepens the shallow socket, however, it is prone to injury from a sudden injury or repetitive trauma. On MRI, the labrum is usually seen as black triangular structure around the rim of the glenoid fossa. When damaged, the labrum can develop a tear, become displaced or be associated with paralabral cysts. The MR radiologist also needs to be aware of normal labral variants including normal fluid signal clefts that can mimic a tear making imaging of the shoulder very interesting and sometimes challenging.

There are two common types of labral tear. Firstly, the superior labral or SLAP (superior labral anterior to posterior) tear, which can be due to acute or repetitive trauma. Secondly the Bankart lesion (usually anteroinferior) which is commonly associated with anterior shoulder dislocation. Each of these have several variants, and give symptoms of pain and instability.

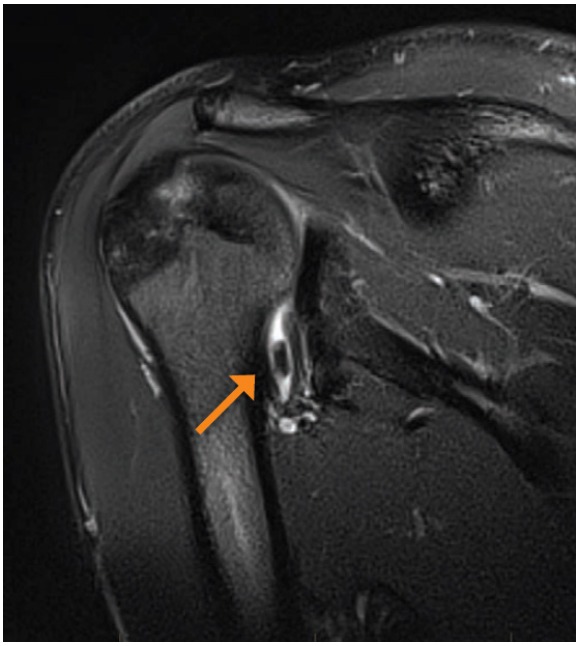

Figure 1:
Loose chondral body (arrow) within the inferior recess of the shoulder joint, surrounded by high signal joint fluid.

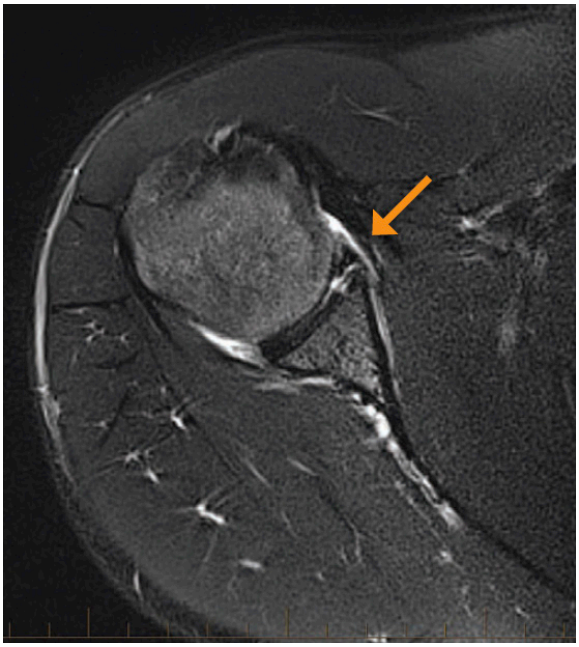

Figure 2:
Patient with previous anterior dislocation and a Bankart lesion. Cleft of high signal (arrow) indicating a tear at the antero-inferior corner of the labrum. Importantly there is no underlying glenoid fracture (bony Bankart lesion).

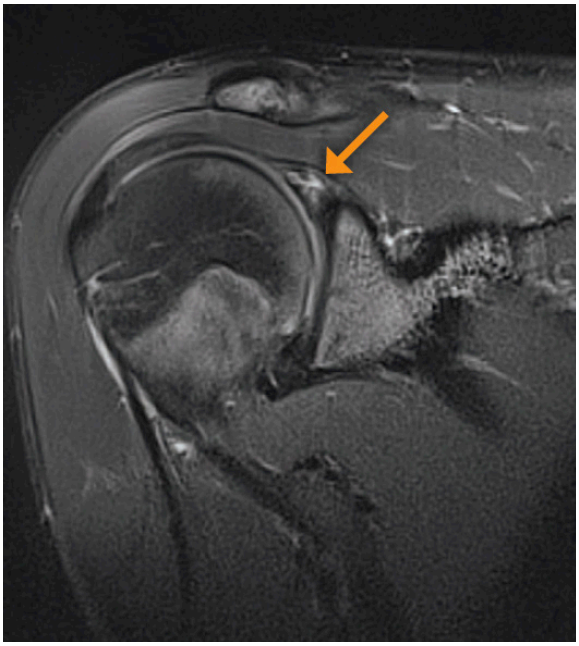

Figure 3:
Superior labral tear (arrow) in a patient with chronic shoulder pain.

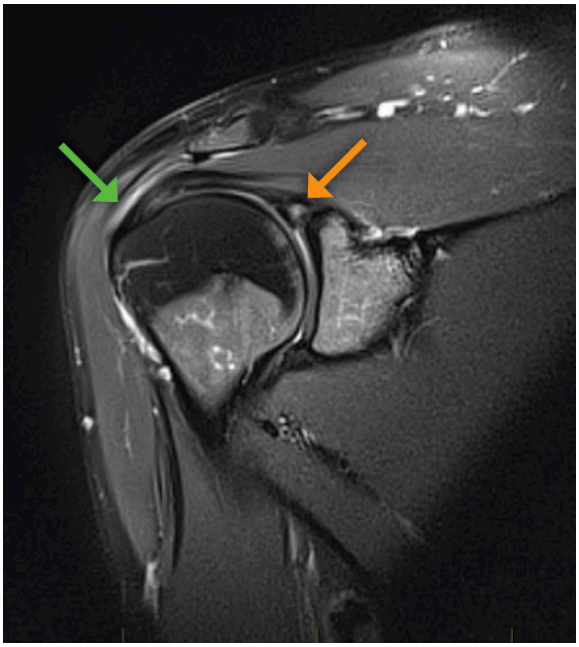

Figure 4:
Co-existing shoulder pathology. This patient has a SLAP tear (green arrow) and also has features of subacromial-subdeltoid bursitis (orange arrow).

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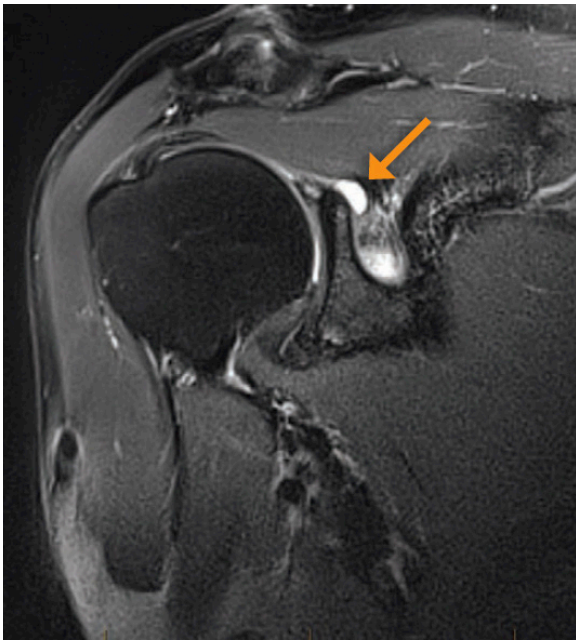

Figure 5:
SLAP tear with a small paralabral cyst

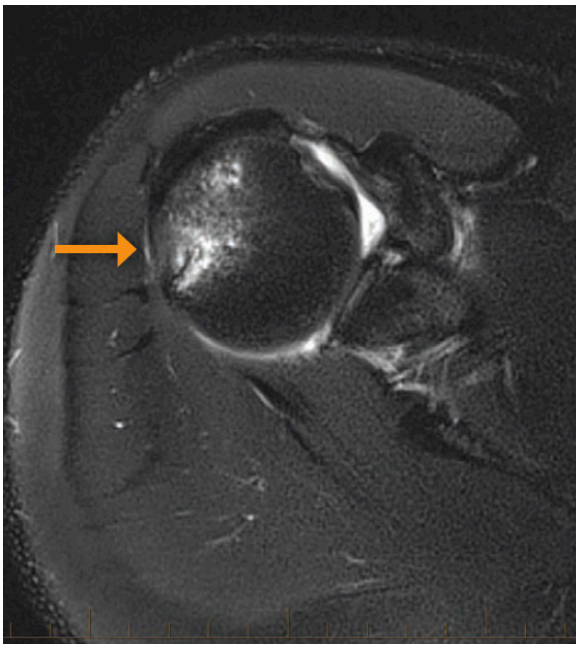

Figure 6:
Patient with a recent history of anterior dislocation. Here is a Hill-Sachs fracture and bone bruise.

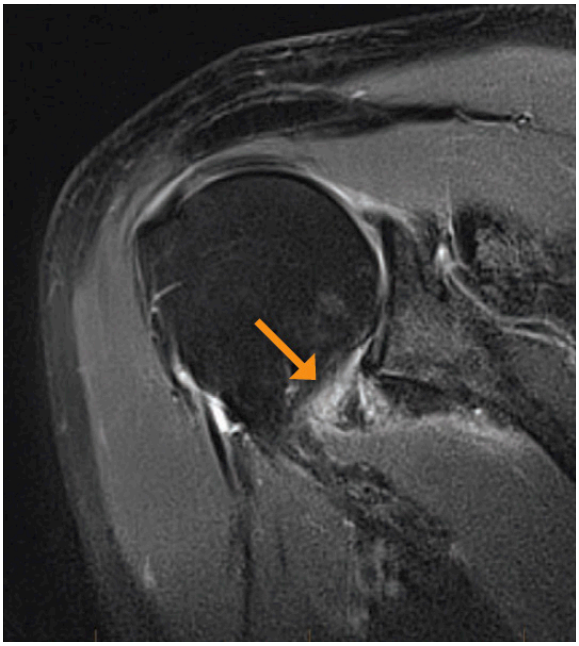

Figure 7:
This injury involves disruption of the humeral attachment of the inferior glenohumeral ligament which forms part of the shoulder capsule. This type of injury is known as a HAGL (Humeral Avulsion Glenohumeral Ligament).

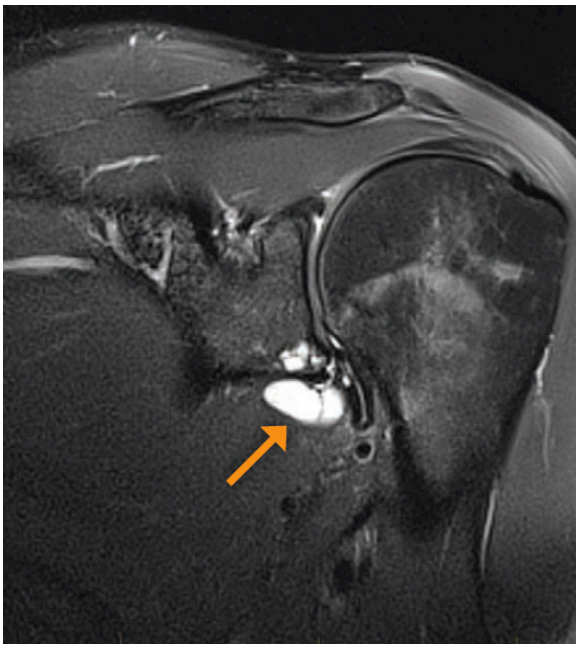

Figure 8:
Extensive inferior labral tear with a multilocular paralabral cyst and cystic bony change within the inferior glenoid.

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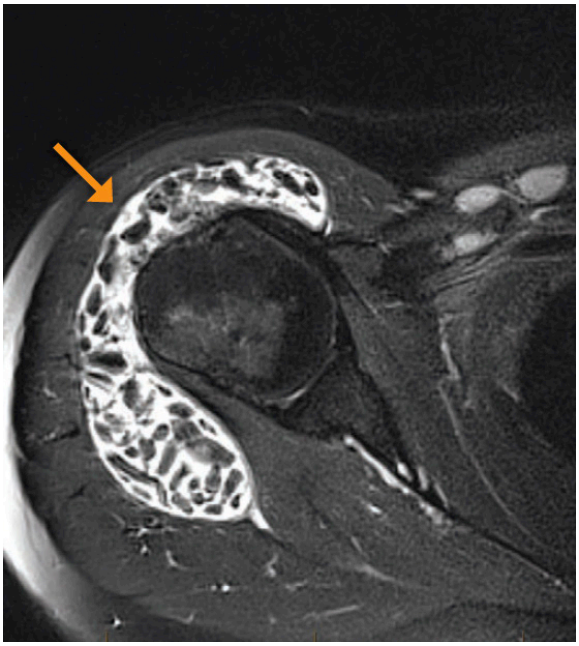

Figure 9:
Patient with rheumatoid arthritis with complex bursitis evident on US. Characteristic Rice Bodies are present in the bursa. These are small loose bodies which occur as a result of chronic inflammation. MRI showed that there was no associated intra-articular pathology in this patient.

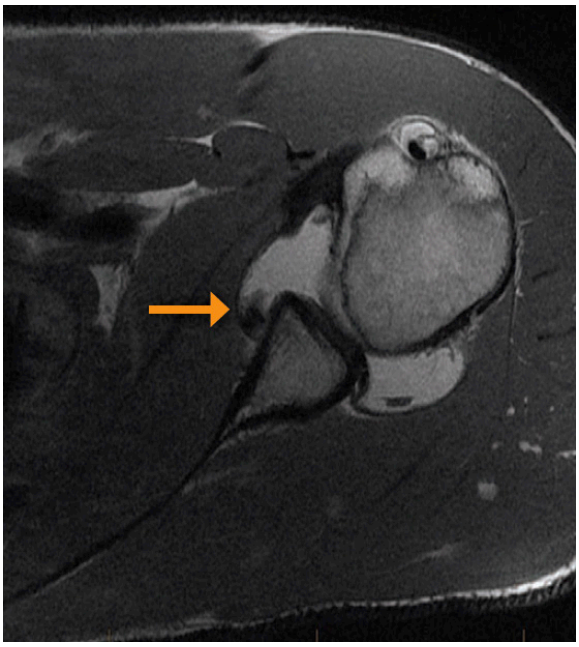

Figure 10:
ALPSA. This patient suffered a Bankart variant known as an ALPSA (Anterior Labral Periosteal Sleeve Avulsion), where the labrum is displaced medially, away from the glenoid rim. Unlike the Bankart lesion in which the labrum is avulsed from the underlying glenoid, in an ALPSA lesion the mobilised labrum remains attached to the periosteum which overlies the glenoid (thus sleeve). As a result it can heal (as opposed to Bankart which do not), however it can do so in an abnormal position requiring identification and early surgical repair.

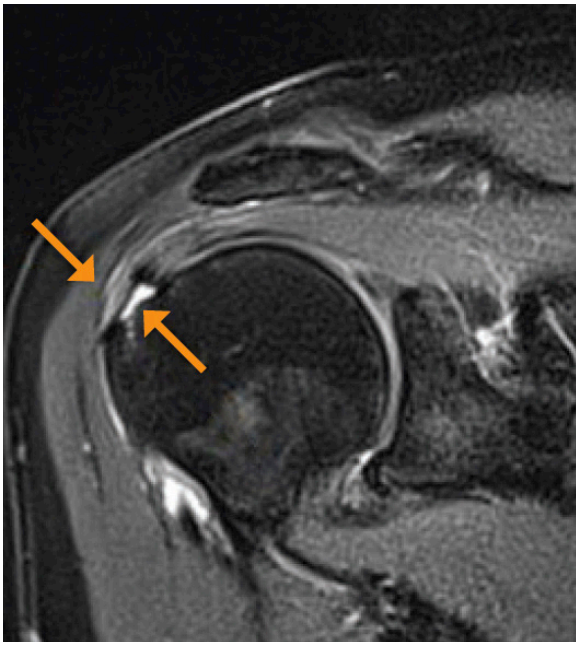

Figure 11:
There is a partial thickness tear, showing bright fluid signal where supraspinatus inserts onto the humeral head. This is a common site for rotator cuff tears. Incidentally there is some thickening of the overlying subdeltoid bursa.

Figure 12:
Thickening of the subdeltoid bursa, with bright fluid signal overlying the supraspinatus tendon which is intact.

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Dr Tim Dunshea studied medicine at Monash University and completed radiology training at St Vincent's Hospital. After that Tim completed a musculoskeletal imaging fellowship with I-MED Radiology Victoria House. He has extensive experience in cardiac imaging including coronary artery CTA (for which he has ANZCTCA Level 1 registration). Tim has worked with I-MED Radiology since 2006 and has been Clinic Director at I-MED Radiology Warringal since November 2009, and is also Clinic Director at I-MED Radiology Heidelberg. Tim is an experienced general radiologist with special interests in MRI, cardiac CT, and ultrasound.

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