# Looking at rotator cuff disease

**MATTHEW LEE** MB BS(Hons), FRANZCR

**This clinic is designed to help you to see what the radiologist sees. It is not a comprehensive discussion of a given condition, but a guide to the radiological features. What do these images tell you?**

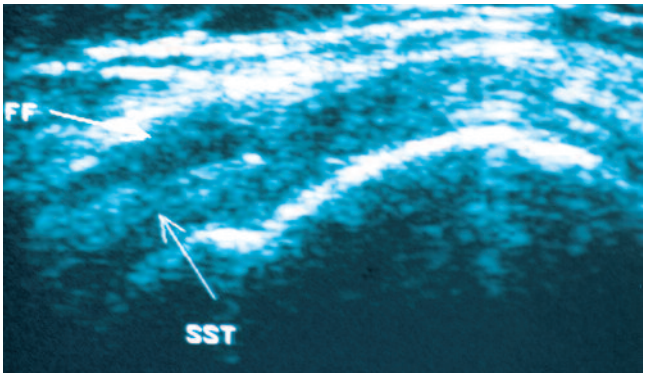


Figure 1. A full thickness tear of the supraspinatus tendon (SST) with retraction. Note the fluid (FF), seen as a blacker area in the thickened subacromial bursa.

## What the terms mean

**Hypoechogenic/hypoechoic**
These terms are used interchangeably. Hypoechogenic areas are black or blacker than surrounds

**Heterogeneity**
Heterogeneity is seen as a combination of both hypoechoic (black) and hyperechoic (white) areas

**Impingement**
Because of narrowing of the subacromial space (from whatever cause), when the shoulder is abducted the supraspinatus tendon bunches and does not 'slide' under the acromion

## Case presentation

The images in this clinic are from different patients who were suffering with shoulder pain, with or without a decrease in range of motion.

## Modalities

The two principal initial modalities used for shoulder assessment of suspected rotator cuff pathology are plain x-ray and ultrasound. Both are helpful in providing bone and soft tissue assessment. Further imaging with CT arthrography or MRI with or without arthrography may be carried out if it is considered necessary.

## Preparation

No preparation is necessary.

## Technique

### X-ray

The basic x-ray views – anteroposterior (AP) and lateral – give a limited appreciation of the joint; therefore, further views are considered necessary. These include:

- AP with the shoulder in internal and external rotation
- AP oblique view of the shoulder
- axillary view – with the patient's arm outstretched (abducted) and resting on the x-ray table.

This combination of views allows assessment of major bony landmarks as well as detection of soft tissue calcification. Additional views are sometimes done.

## Ultrasound

Each tendon of the rotator cuff is examined in turn by the ultrasound probe – biceps, supraspinatus, infraspinatus, teres minor and subscapularis. Bursae are also identified when applicable. Subscapular and supraspinatus tendons, in particular, are examined dynamically – the supraspinatus tendon with abduction to look for impingement.

Tears, fluid, bursal thickening, impingement and areas of maximal tenderness are the principal points of focus of ultrasound examination.

## Ultrasonic signs

### Showing a tear

### Direct signs

Signs of a full thickness tear include:

- a discontinuity in the tendon – the presence and extent of retraction (Figure 1) is noted

Dr Lee is a Radiologist, Mater Imaging, Mater Hospital, North Sydney, NSW.

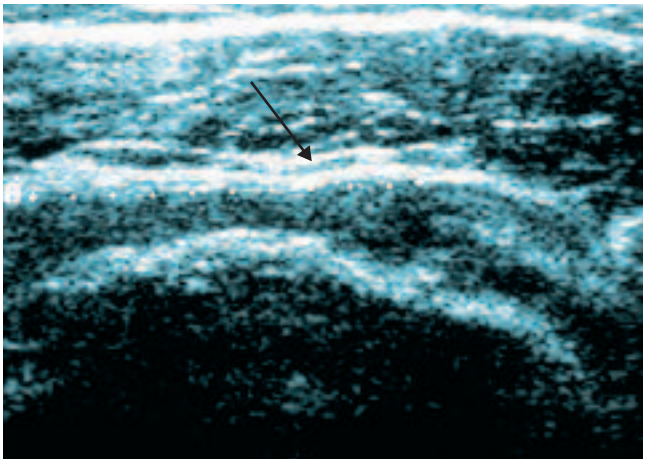

Figure 2. A full thickness tear of the supraspinatus tendon. Note the contour deformity (flattening).

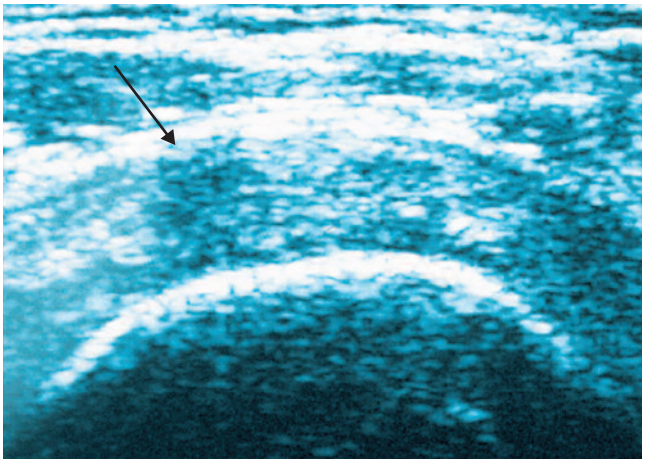

Figure 3. A partial thickness tear of the supraspinatus tendon. Note the focal area of hypoechogenicity.

- a significant contour deformity (Figure 2).
  The signs of a partial thickness tear include:
- an area of tendon heterogeneity often with specific tenderness
- a focal area of hypoechogenicity (Figure 3) or heterogeneity.

### Indirect signs

Indirect signs of a tear include:

- bursal fluid and bursal thickening (Figure 1)
- bicipital sheath fluid and joint fluid.

### Showing impingement

Impingement signs include:

- bunching of the supraspinatus tendon with abduction so that it does not 'slide' under the acromion – with or without pain.

## Key points

A combination of x-ray views of the shoulder allows detection of bony abnormalities and soft tissue calcification. Ultrasound is a dynamic examination that allows appropriate and often definitive assessment of rotator cuff disease. MT