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Articular surface disease is difficult to detect using non-invasive techniques. MRI is probably the best method, although it is not - sensitive to early chondral changes (Figure 8.21). Higher field strength magnets (3 tesla and above) with dedicated surface coils - provide more precise assessment; however, MR arthrography - is currently the imaging 'gold standard'. A dilute quantity of gadolinium DTPA is introduced into the joint by needle puncture under fluoroscopic, CT or ultrasound guidance, which is followed by an MRI examination. Using this technique, more subtle changes in the articular surface can be seen, including thinning, fissuring and ulceration. However, early softening of articular cartilage will not be visible. MR arthrography is also useful for detecting labral tears in the shoulder or hip, and in the assessment of patients who have undergone a previous meniscectomy . The triangular fibrocartilage of the wrist is also difficult to assess fully without MR or CT arthrography (Figure 8.22). - In the shoulder, rotator cuff trauma and degenerative changes can be studied using ultrasound or MRI. In experienced hands, ultrasound has a higher accuracy rate because image resolution is better and because the mechanical integrity of the cuff can be tested by dynamically stressing it (Figure 8.23). MRI has the advantage of being able to show abnormalities in the subcortical bone. In the majority of arthropathies and degenerative disorders, serial imaging is useful. Changes in films taken weeks or months apart are far easier to see and interpret than a single snapshot study .

Figure 8.19 Axial T2-weighted fat-suppressed image of the wrist in a patient with rheumatoid arthritis demonstrates synovitis manifested as increased signal dorsal to the carpal bones (arrow). (a) (b) Figure 8.20 Ultrasound of the wrist (a) shows thickening of tissues on the dorsal aspect of the radiocarpal joint (arrow). (b) There is increased flow on power Doppler ultrasound in this patient with wrist synovitis and rheumatoid arthritis. Figure 8.21 Coronal magnetic resonance imaging of the knee demonstrates a focal osteochondral abnormality of the medial femoral condyle, with full-thickness loss of the articular cartilage and abnormality of the subchondral bone (arrow). Figure 8.22 Coronal computed tomography arthrogram of the wrist showing a central perforation of the triangular fibrocartilage with contrast extending into the distal radioulnar joint (arrow) and radiocarpal articulation.

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Figure 8.23 Ultrasound of the supraspinatus tendon identifies a partial tear of the tendon (arrow), which is predominantly articular sided but with a component that is nearly full thickness. Radiographs are good for assessing established articular disease Synovitis can be detected using ultrasound or contrast-enhanced MRI Early damage to articular cartilage is difficult to image by conventional methods Rotator cuff lesions are best studied using ultrasound or MRI Destructive lesions are best studied first on plain radiographs MRI is best for staging tumours Biopsy can be

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Revision #1

Created 2025-12-31 15:28:43 UTC by Omar Ayman

Updated 2025-12-31 15:28:43 UTC by Omar Ayman