

Acetabular Labral Tears

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The acetabular labrum is a horseshoe-shaped rim of fibrocartilaginous tissue attached to the perimeter of the acetabulum. The transverse acetabular ligament connects the 2 inferior limbs of the horseshoe. The labrum deepens the acetabulum to provide additional stability to the femoral head at the hip joint. Magnetic resonance imaging (MRI) directly delineates the normal labrum as a triangular, homogenous, low-signal-intensity (dark) structure on all imaging sequences. The labrum varies in shape and tends to become rounded and irregular with age, the latter likely reflective of degenerative changes.¹ Focal intermediate-to-slightly high-signal intensity may be seen within the labrum, often at the junction of the labrum and the acetabulum, in up to half of asymptomatic patients.^{1,2} This intralabral signal sometimes mimics a tear on conventional nonarthrographic MR images.

Acetabular labral tears are a recognized cause of hip pain in the absence of plain radiographic findings. Patients with a labral tear may present with a limp, groin or hip pain, or mechanical symptoms, such as clicking, locking, and decreased range of motion. They may also present with nonspecific symptoms, which can delay the diagnosis of labral injury.^{3,4} Timely diagnosis of an acetabular labral tear is important, as tears cause hip dysfunction in young patients and are a primary precursor of hip osteoarthritis.⁴

Labral tears may be anterior, posterior, or superior (lateral); 92% to 94% of labral tears are anterior⁵ (Figure 1). Isolated posterior labral tears are often seen in patients with a history of hip dysplasia or posterior hip dislocation (Figure 2). Tears of the acetabular labrum can be seen on MRI as linear high-signal areas extending to the free edge or fluid extending within the substance of the labrum (Figure 3). Labral tears may also manifest as a frank detachment of the labrum from the acetabulum. In young patients, abnormal morphology of the triangular labrum may indicate a tear. Similar to a tear of the glenoid labrum in the shoulder, an acetabular labral tear can lead to formation of a paralabral cyst (Figure 4). Presence of a

paralabral cyst should raise strong suspicion of an underlying associated acetabular labral tear.

MR arthrography (MRA) with intra-articular gadolinium is the modality of choice for evaluating a suspected labral tear. MRA may show bright high-signal contrast extending into the labrum or between the labrum and the acetabulum. The technique leads to improved sensitivity and specificity in the evaluation of labral tears.¹ MRA

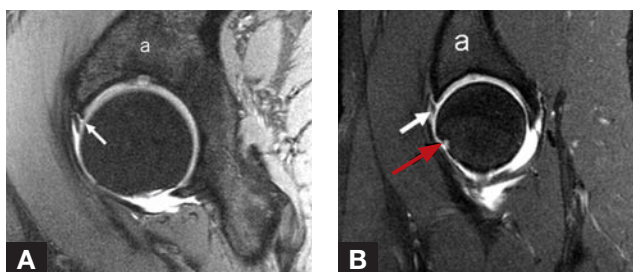


Figure 1. Anterior labral tear. (A) Sagittal T_1 -weighted fat-saturated magnetic resonance arthrographic (MRA) image shows high-signal contrast within the substance of the anterior labrum, confirming tear (solid arrow). (B) Sixteen-year-old female ballet dancer presents with right hip pain and locking. Sagittal T_1 -weighted fat-saturated MRA image shows attenuated and displaced anterior labrum (white arrow). Note high-signal contrast between labrum and acetabulum (a). A defect along the anterior femoral neck (red arrow) is secondary to femoral acetabular impingement, which can be associated with labral tears.

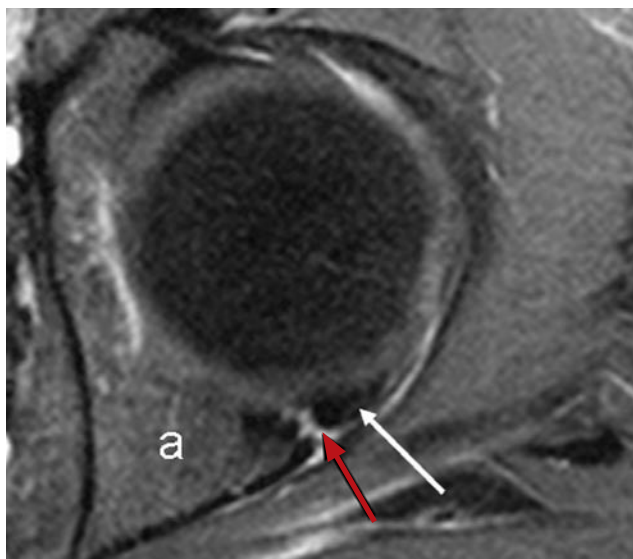


Figure 2. Posterior labral tear. Axial T_2 -weighted fat-saturated magnetic resonance arthrographic image shows high-signal-intensity fluid (red arrow) traversing base of posterior labrum (white arrow), consistent with posterior labral tear. Posterior labral tears are seen with hip dysplasia and posterior dislocation but also are increased in select athletes and in some Asian populations.

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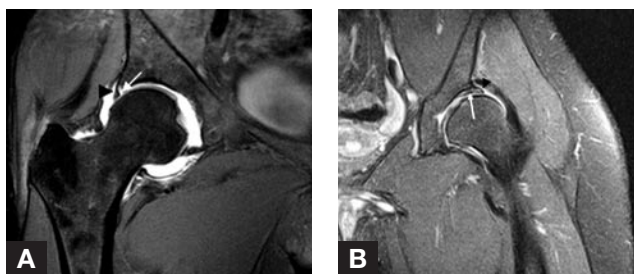


Figure 3. Superior labral tear. (A) Postarthrogram coronal sequence shows labral detachment with fluid separating labrum from acetabulum (solid arrow). There is a normal perilabral recess (arrowhead). The latter is a normal space created by the capsule inserting several millimeters above the acetabular rim. This space may fill with joint fluid or contrast. (B) Coronal proton-density fat-saturated magnetic resonance imaging shows an extensive superior/lateral labral tear with linear increased signal within substance of labrum (solid arrow) and normal perilabral recess (arrowhead).

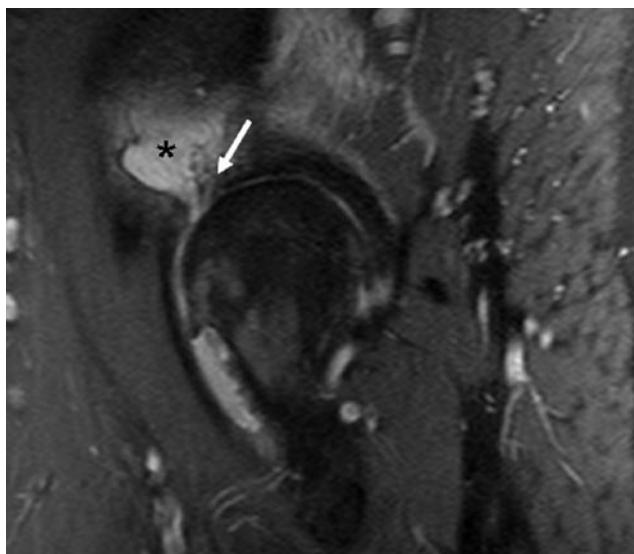


Figure 4. Paralabral cyst. Noncontrast proton-density fat-saturated magnetic resonance imaging of hip shows anterior acetabular labrum tear with abnormal morphology and increased internal signal (arrow). Fluid extends through the tear superiorly, forming an associated paralabral cyst (star).

using a small field of view (14-20 cm) is 92% sensitive in detecting labral tears.⁶

There are two noteworthy pitfalls in MR evaluation of the acetabular labrum. First, perilabral sulci (normal recesses) may fill with joint fluid as the joint capsule inserts several millimeters above the acetabular rim¹ (Figure 3). Second, the normal low-signal-intensity iliopsoas tendon passes just anterior to the anterior labrum and may be mistaken for a

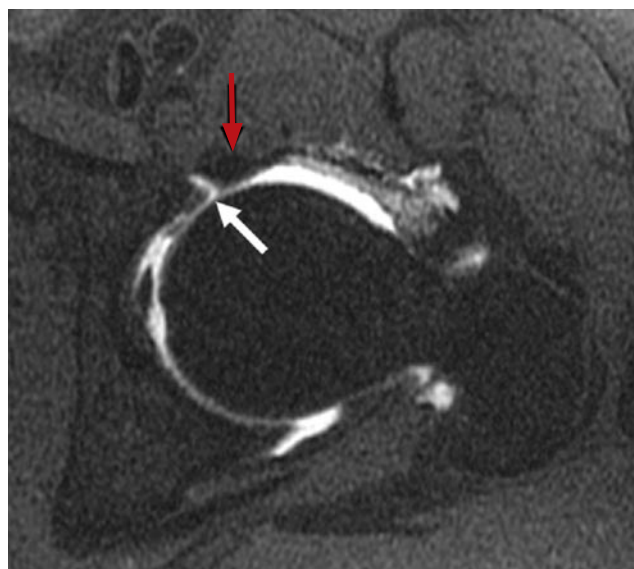


Figure 5. Pitfall. Postarthrogram axial T₁-weighted fat-saturated image shows iliopsoas tendon (red arrow) passing adjacent to anterior acetabulum. Intra-articular high-signal contrast (white arrow) extends between acetabulum/labrum and extra-articular iliopsoas tendon, simulating labral tear or detachment.

labral tear by inexperienced readers (Figure 5). Fortunately, these normal variants are quickly learned as the reader gains experience. Some authors have suggested that normal variant sublateral sulci may exist at the anterior acetabulum and possibly in other quadrants, but these findings are controversial and not universally accepted.^{1,5,7}

AUTHORS' DISCLOSURE STATEMENT

The authors report no actual or potential conflict of interest in relation to this article.

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