Superior Labral Anterior to Posterior (SLAP) Tears

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The normal labrum is of low signal intensity, appearing black on all magnetic resonance (MR) sequences. Much like tears of the meniscus of the knee, labral tears are seen as intermediate- to high-signal-intensity areas within the labrum that extend to an articular surface. Tears may also present as an abnormal detachment or displacement of the labrum from the glenoid. MR arthrography shows contrast extending into these tears. For detection of superior labral anterior to posterior (SLAP) tears, MR arthrography is the preferred imaging technique (sensitivity, 82%; specificity, 98%).[1]

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When evaluating for a SLAP tear, one should first direct attention to the coronal images, looking superiorly at the biceps-labral complex. Once a labral tear is confirmed, evaluate the biceps tendon for involvement by the tear. Then determine extension of the tear along the anterior and posterior labrum on the axial images. Finally, inspect the glenohumeral ligaments for extension of tear into these structures.

Snyder and colleagues[2] originally identified 4 types of SLAP tears (described below). Of less clinical utility are 6 additional types (V-X) identified later, which deal with anterior and posterior extensions of the tears and involvement of the glenohumeral or coracohumeral ligaments.[3] Type I lesions (11%) exhibit an irregular surface contour and/or increased signal within the superior labrum consistent with degenerative fraying. Type II lesions (41%) demonstrate globular high signal consistent with detach-

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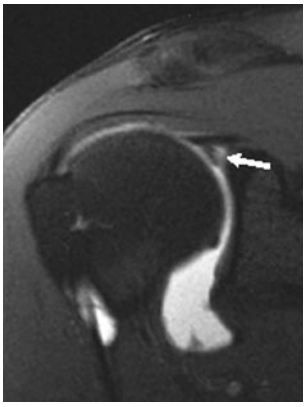

Figure 1. Magnetic resonance arthrogram shows contrast extending into the labrum—consistent with a type II superior labral anterior to posterior tear (arrow).

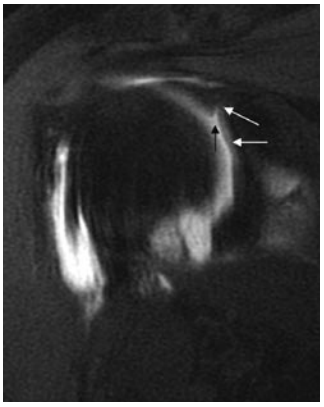

Figure 2. Coronal magnetic resonance arthrogram shows sublabral recess. The glenoid cartilage is intermediate in signal (arrows). Note how the bright contrast extends medially into the recess (black arrow) following the course of the glenoid cartilage. The margins of the recess are regular.

Figure 3. Coronal T_2-weighted fat saturation image shows a type II superior labral anterior to posterior tear (arrow) with an associated paralabral cyst (*) that extends into the spinoglenoid notch. Note how the tear does not follow the course of the glenoid cartilage.

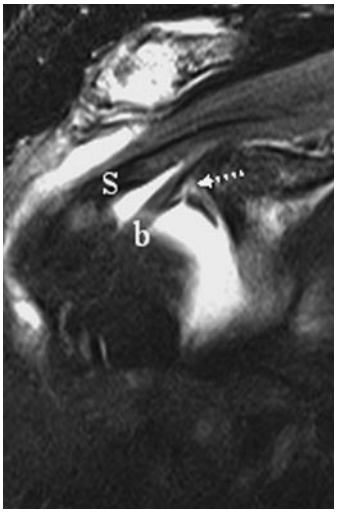

Figure 4. T_2-weighted fat saturation image shows a type IV superior labral anterior to posterior tear in a patient with a shoulder effusion. Note the bucket-handle labral tear with associated extension of the tear into the undersurface of the biceps tendon. Supraspinatus tendon (s); biceps tendon (b); labral tear extending into the undersurface of the long head of the biceps tendon (arrow).

ment of the labral bicipital complex from the superior glenoid (Figure 1). It is often difficult to distinguish a type II SLAP tear from a troublesome normal variant, the sublabral recess. The sublabral recess, a sulcus between the biceps-labral complex and the glenoid, is located roughly from the 11- to 1-o'clock position and is found in 73% of cadavers.[4] Contrast filling a sublabral recess will track medially along the course of the glenoid cartilage and will demonstrate a smooth contour. Conversely, contrast within a SLAP tear tends to track superiorly and laterally within the labrum, and its margins tend to be irregular (Figure 2). Extension of contrast beyond the biceps origin or an associated paralabral cyst also favors SLAP tear over a sublabral recess[5] (Figure 3). Two other normal variants, the sublabral foramen (a sublabral hole) and the Buford complex (absence of the anterosuperior labrum with a cordlike middle glenohumeral ligament), are located in the anterosuperior quadrant and are to be distinguished from tears and tear extensions.

Type III (33%) and type IV (15%) SLAP lesions are bucket-handle tears of the superior labrum. The bucket-handle fragment may be displaced. Both types demonstrate linear high signal tracking superiorly and then laterally within the labrum. The tears then extend either to the superolateral free edge of the labrum, in the case of a type III lesion, or into the biceps tendon, in the case of a type IV lesion (Figure 4).

Author's Disclosure Statement

The author reports no actual or potential conflict of interest in relation to this article.

References

1. Waldt S, Burkhart A, Lange P, Imhoff AB, Rummeny EJ, Woertler K. Diagnostic performance of MR arthrography in the assessment of superior labral anteroposterior lesions of the shoulder. *AJR Am J Roentgenol*. 2004;182(5):1271-1278.
2. Snyder SJ, Karzel RP, Del Pizzo W, Ferkel RD, Friedman MJ. SLAP lesions of the shoulder. *Arthroscopy*. 1990;6(4):274-279.
3. Mohana-Borges AV, Chung CB, Resnick D. Superior labral anteroposterior tear: classification and diagnosis on MRI and MR arthrography. *AJR Am J Roentgenol*. 2003;181(6):1449-1462.
4. Smith DK, Chopp TM, Aufdemorte TB, Witkowski EG, Jones RC. Sublabral recess of the superior glenoid labrum: study of cadavers with conventional nonenhanced MR imaging, MR arthrography, anatomic dissection and limited histologic examination. *Radiology*. 1996;201(1):251-256.
5. Jin W, Ryu KN, Kwon SE, Rhee YG, Yang DM. MR arthrography in the differential diagnosis of type II superior labral anteroposterior lesion and sublabral recess. *AJR Am J Roentgenol*. 2006;187(4):887-893.