Editorial Commentary: Posterior Shoulder Instability and Anatomic Capsular-Labral Reconstruction: Repair the Posterior Inferior Glenohumeral Ligament to the Glenoid Neck at the 7 O'Clock Position

Erik Hohmann, M.B.B.S., F.R.C.S., F.R.C.S. (Tr&Orth), Ph.D., M.D., Associate Editor

Abstract: Posteroinferior glenohumeral instability occurs in 10% of all instability cases but is observed increasingly more often. Arthroscopic posterior capsulolabral repair is the current standard for surgical management if nonoperative treatment fails. In contrast to the anterior inferior glenohumeral ligament (IGHL), the posterior IGHL inserts onto the glenoid surface rather than onto the labrum. This implies that suture anchors should be placed on the glenoid rim when repairing these defects. However, clinical studies demonstrate excellent clinical outcomes irrespective of the location of the suture anchor.

See related article on page 2814

Over the past 25 years, shoulder surgeons have mainly focused on anterior shoulder instability.[1] In general, repair of the capsulolabral-ligamentous complex using arthroscopic techniques and suture anchors is the primary goal of treatment.[1-3] In contrast, posterior glenohumeral instability is not that common and represents only 10% of all instability events.[3,4] However, posterior shoulder instability is increasingly common and more often encountered in contact athletes.[3,5] Repetitive and posteriorly directed loads can induce posteroinferior labral tears.[5] As with anterior shoulder instability, the same principles of treatment apply: if there is no bone loss observed, arthroscopic posterior capsulolabral repair is the gold standard for surgical management if nonoperative treatment is unsuccessful.[5]

Labral studies have demonstrated that the labrum is not a uniform structure and has different structural morphologies.[6] In the posterior and inferior segments, however, labrum morphology is consistent, and a firm bond between labrum and glenoid increasing the posterior glenoid surface is the norm.[6] In contrast to the anterior inferior glenohumeral ligament (IGHL), the posterior IGHL inserts onto the glenoid articular surface rather than onto the labrum.[6] Histologically, the labrum is triangular in cross section, and some fibers also extend into the joint space.[7] The labrum between 6 and 8 o'clock normally does not exceed the level of the cartilage layer.[7]

Kim and colleagues[8,9] have taught us that patients with posterior instability have a concealed lesion with an apparent intact labrum and stripping of the labrum at the junction between labrum and articular cartilage. This lesion seems to correspond with the morphology of the posteroinferior labrum as described by Barthel et al.[6] and Sager et al.[7] Interestingly, Kim et al.[9] described placement of a suture anchor onto the articular surface of the glenoid 2 mm from the rim for an anatomic repair. Now Koga, Itoigawa, Wada, Morikawa, Ichimura, Sakai, Kawasaki, Maruyama, and Kaneko, in their article "Anatomic Analysis of the Attachment of the Posteroinferior Labrum and Capsule to the Glenoid: A Cadaveric Study,"[10] used a slightly different approach, measuring the height of the posterior IGHL attachment to the labrum and the depth of the posteroinferior labrum, and investigated the morphology histologically. The authors have shown that the posterior IGHL inserts between 7 and 9 o'clock in 96% of cases.[10] In 98%, however, the labrum did not attach to the articular surface but attached to both articular cartilage and bone.[10] Based on their findings, they recommend repair of the posterior IGHL onto the

The author reports the following potential conflicts of interest or sources of funding: E.H. reports fees from the Arthroscopy Association of North America. Full ICMJE author disclosure forms are available for this article online, as supplementary material.

0749-8063/201436/$36.00

https://doi.org/10.1016/j.arthro.2020.08.022

glenoid neck at 7 o'clock.[10] The anatomic findings confirm the earlier studies[6,7] and are consistent with the description of the Kim lesion.[8,9]

The question is, how important are these findings for clinical practice? Kim and colleagues[8,9] used articular surface-based suture anchors and reported 95% success rates. In contrast, Bradley et al.[11] placed suture anchors at the glenoid rim and reported 90% return-to-sports rates, with high American Shoulder and Elbow Surgeons (ASES) scores, at a mean follow-up of 36 months. These 2 studies serve as anecdotal evidence to strengthen my case: anchor placement does not seem to matter here. Furthermore, the Bradley et al. case series[11,12] included contact athletes who literally bump into each other all the time on the pitch, continuously stressing these repairs.[12] Obviously, other factors also play a role. Smaller glenoid width seems a more important predictor of poor outcome.[11-13] The principle behind labral repair/reconstruction is to reduce glenohumeral translational movements, and surprisingly, it appears that repair does not really correct glenohumeral translation. In a small case series, Lädermann et al.[14] demonstrated elegantly that surgical stabilization does not restore glenohumeral translation during functional range of motion.

Koga et al.[10] have done a great job in describing the anatomy of the posteroinferior labrum and capsule. In their population, the labrum did not attach to the articular surface, with the posterior IGHL attaching between 7 and 9 o'clock. It is a well-done basic science study; the clinical relevance is yet to be determined. The recommendation that the posteroinferior labrum should not be repaired to the articular surface is not supported by their data or the currently available clinical studies. To come back to the title of this commentary: does the 7 o'clock anchor belong on the glenoid neck? We do not know; this study does not answer this clinically relevant question, but it probably does not matter.

References

1. Hohmann E, Tetsworth K, Glatt V. Open versus arthroscopic surgical treatment for anterior shoulder dislocation: A comparative systematic review and meta-analysis over the past 20 years. *J Shoulder Elbow Surg* 2017;26:1873-1880.
2. Gao B, DeFroda S, Bokshan S, et al. Arthroscopic versus open Bankart repairs in recurrent anterior shoulder instability: A systematic review of the association between publication date and postoperative recurrent instability in systematic reviews. *Arthroscopy* 2020;36:862-871.
3. DiMaria S, Bokshan SL, Nacca C, Owens B. History of surgical stabilization for posterior shoulder instability. *JSES Open Access* 2019;3:350-356.
4. Owens BD, Campbell SE, Cameron KL. Risk factors for posterior shoulder instability in young athletes. *Am J Sports Med* 2013;41:2645-2649.
5. Sheean AJ, Arner JW, Bradley JP. Posterior glenohumeral instability: Diagnosis and management. *Arthroscopy* 2020;36:2580-2582.
6. Barthel T, König U, Böhm D, Loehr JF, Gohlke F. Anatomy of the glenoid labrum. *Orthopade* 2003;32:578-585.
7. Sager M, Herten M, Ruchay S, Assheuer J, Kramer M, Jäger M. The anatomy of the glenoid labrum: A comparison between human and dog. *Comp Med* 2009;59:465-475.
8. Kim SH, Ha KI, Park JH, et al. Arthroscopic posterior labral repair and capsular shift for traumatic unidirectional recurrent posterior subluxation of the shoulder. *J Bone Joint Surg Am* 2003;85:1479-1487.
9. Kim SH, Ha KI, Yoo JC, Noh KC. Kim's lesion: An incomplete and concealed avulsion of the posteroinferior labrum in posterior or multidirectional posteroinferior instability of the shoulder. *Arthroscopy* 2004;20:712-720.
10. Koga A, Itoigawa Y, Wada T, et al. Anatomic analysis of the attachment of the posteroinferior labrum and capsule to the glenoid: A cadaveric study. *Arthroscopy* 2020;36:2814-2819.
11. Bradley JP, McClincy MP, Arner JW, Tejwani SG. Arthroscopic capsulolabral reconstruction for posterior instability of the shoulder: A prospective study of 200 shoulders. *Am J Sports Med* 2013;41:2005-2014.
12. Bradley JP, Arner JW, Jayakumar S, Vyas D. Revision arthroscopic posterior shoulder capsulolabral repair in contact athletes: Risk factors and outcomes. *Arthroscopy* 2020;36:660-665.
13. Bradley JP, Arner JW, Jayakumar S, Vyas D. Risk factors of revision arthroscopic posterior shoulder capsulolabral repair. *Am J Sports Med* 2018;46:2457-2465.
14. Lädermann A, Denard PJ, Tirefort J, et al. Does surgery for instability of the shoulder truly stabilize the glenohumeral joint? A prospective comparative cohort study. *Medicine (Baltimore)* 2016;95:e4369.