Commentary & Perspective

The Role of Capsular Repair in Latarjet Procedures

Commentary on an article by Yoshiaki Itoigawa, MD, PhD, et al.: "Repairing the Capsule to the Transferred Coracoid Preserves External Rotation in the Modified Latarjet Procedure"

Matthias A. Zumstein, MD, and Sumit Raniga, MBChB, FRACS

The modified Latarjet-Patte procedure[1] is thought to provide stability by both the "bone block" effect from the transfer of the coracoid process to the anteroinferior glenoid rim and the "sling effect" produced by the conjoined tendon and the lowered intact subscapularis below[2,3]. Another possible stabilizing procedure is the repair of the capsule to the transferred portion of the coracoacromial ligament (CAL) after coracoid fixation (capsular-CAL repair). It is unclear whether this has any harmful effects, such as restriction of range of motion.

In their biomechanical cadaveric study, Yamamoto et al.[3] demonstrated that at the end-range of arm position, capsular-CAL repair contributed 23% of the resistance to translational force, with the remaining 77% provided by the sling effect. At the mid-range of arm position, capsular-CAL repair had no effect on stability, with the sling effect contributing 51% to 62% of the resistance to translational force under increasing load and the remaining 38% to 49% contributed by the reconstruction of the glenoid bone defect. It must be noted that those authors evaluated the effect of capsular-CAL repair after removing the sling effect of the subscapularis and conjoined tendon. Removal of this sling effect substantially decreases stability and therefore the effect of capsule repair may be exaggerated. However, despite the lack of this sling effect, capsular-CAL repair had no effect on mid-range stability in that study.

In a more recent biomechanical cadaveric study, Kleiner et al.[4] compared the effect of the Latarjet procedure with and without capsular-CAL repair. The augmentation of the Latarjet procedure with capsular-CAL repair showed a trend toward increasing anteroinferior translational stability in comparison with the Latarjet procedure alone, but this did not reach significance. Both in the scapular as well as in the coronal plane, the external rotation, internal rotation, and total range of motion after the Latarjet procedure with capsular-CAL repair were nearly identical to those in the uninjured shoulder. However, the authors found that the Latarjet procedure alone resulted in significant increases of external rotation and range of motion in the coronal and scapular planes compared with the Latarjet procedure with capsular-CAL repair and with the uninjured shoulders.

To our knowledge, the study by Itoigawa et al. is the first biomechanical study investigating the effect of the capsular repair position on stability and range of motion using cadaveric shoulders. In this study, the anterior capsule was not repaired to the CAL but either to the coracoid process or to the native glenoid as previously published by Bouju et al.[5]. Repair of the anterior capsule to the glenoid rim in external rotation led to a reduction in external rotation at both 0° and 60° of abduction in comparison with the analogous repair of the capsule to the coracoid process. Although there was no difference in stability in the end-range of arm position, mid-range stability was significantly greater in the group that underwent capsular repair to the glenoid rim. The authors conclude that, compared with capsular repair to the glenoid rim, capsular repair to the coracoid preserves external rotation without compromising end-range stability. Capsular repair to the glenoid rim, on the other hand, tightens the anterior soft tissues, reducing external rotation but improving mid-range stability.

Itoigawa et al. question whether the reduction in mid-range stability with anterior capsular repair to the coracoid process is clinically relevant. Their assertion may be supported by the fact that the dynamic sling effect plays an important role in providing mid-range stability[2,3]. Two major limitations of this study are the fact that the capsule was repaired directly to the coracoid process as opposed to the CAL as well as the lack of a normal, uninjured control group. These make it difficult to compare their results with those of the above studies and also limit extrapolation of the findings to the common clinical situation of capsular-CAL repair.

Repairing the capsule to the anterior glenoid rim decreases external rotation but makes the coracoid block extra-articular—this has been shown to lower the rate of osteoarthritis after 13 years of follow-up[5]. With this in mind, our preferred method is to preserve and repair the labrum to make the coracoid process extra-articular, then perform a capsular-CAL repair to preserve external rotation and increase end-range stability[3], while the mid-range stability is provided by the sling and bone block effects.

*Matthias A. Zumstein, MD**
Department of Orthopedic Surgery, Inselspital, University of Bern, Bern, Switzerland
*Sumit Raniga, MBChB, FRACS**

*The authors indicated that no external funding was received for any aspect of this work. On the **Disclosure of Potential Conflicts of Interest** forms, *which are provided with the online version of the article*, one or more of the authors checked "yes" to indicate that the author had a relevant financial relationship in the biomedical arena outside the submitted work.

References

1. Walch G, Boileau P. Latarjet-Bristow procedure for recurrent anterior instability. Tech Shoulder Elbow Surg. 2000;1(4):256-61.

2. Giles JW, Boons HW, Elkinson I, Faber KJ, Ferreira LM, Johnson JA, Athwal GS. Does the dynamic sling effect of the Latarjet procedure improve shoulder stability? A biomechanical evaluation. J Shoulder Elbow Surg. 2013 Jun;22(6):821-7. Epub 2012 Sep 28.

3. Yamamoto N, Muraki T, An KN, Sperling JW, Cofield RH, Itoi E, Walch G, Steinmann SP. The stabilizing mechanism of the Latarjet procedure: a cadaveric study. J Bone Joint Surg Am. 2013 Aug 7;95(15):1390-7.

4. Kleiner MT, Payne WB, McGarry MH, Tibone JE, Lee TQ. Biomechanical comparison of the Latarjet procedure with and without capsular repair. Clin Orthop Surg. 2016 Mar;8(1):84-91. Epub 2016 Feb 13.

5. Bouju Y, Gadéa F, Stanovici J, Moubarak H, Favard L. Shoulder stabilization by modified Latarjet-Patte procedure: results at a minimum 10 years' follow-up, and role in the prevention of osteoarthritis. Orthop Traumatol Surg Res. 2014 Jun;100(4)(Suppl):S213-8. Epub 2014 Apr 3.