J Shoulder Elbow Surg (2014) 23, 1059-1065

ELSEVIER

Journal of Shoulder and Elbow Surgery

www.elsevier.com/locate/ymse

Surgical treatment of isolated type II superior labrum anterior-posterior (SLAP) lesions: repair versus biceps tenodesis

Eugene T.H. Ek, MBBS, PhD, FRACS[a], Lewis L. Shi, MD[b], Jeffrey D. Tompson, MS[c], Michael T. Freehill, MD[d], Jon J.P. Warner, MD[c,*]

[a]*Melbourne Orthopaedic Group and Department of Orthopaedic Surgery, University of Melbourne, Austin Hospital, Melbourne, Australia*
[b]*Department of Orthopaedic Surgery and Rehabilitation Medicine, The University of Chicago Hospitals, Chicago, IL, USA*
[c]*Harvard Shoulder Service, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA*
[d]*Sports and Shoulder Service, Department of Orthopaedic Surgery, Wake Forest University Baptist Medical Center, Winston-Salem, NC, USA*

Background: It is still unclear which patients with isolated type II superior labrum anterior-posterior (SLAP) lesions benefit from either superior labral repair or biceps tenodesis. This study evaluates the indications and outcomes of patients with isolated type II SLAP lesions who have undergone either procedure.
Methods: A retrospective analysis was performed of patients who had surgery for an isolated type II SLAP lesion between 2008 and 2011. There were 25 patients: 15 underwent biceps tenodesis, with a mean follow-up of 31 months (range, 26-43 months), and 10 underwent SLAP repair, with a mean follow-up of 35 months (range, 25-52 months). The mean age was 47 years (range, 30-59 years) in the tenodesis group and 31 years (range, 21-43 years) in the repair group.
Results: At latest follow-up, both groups showed significant improvements in subjective shoulder value and pain score. No difference was observed in American Shoulder and Elbow Surgeons score (93.0 vs 93.5, $P = .45$), patient satisfaction (93% vs 90%, $P = .45$), or return to preinjury sporting level (73% vs 60%, $P = .66$). Analysis of the indications for treatment showed that in the large majority, tenodesis was performed in older patients (>35 years) and patients who showed degenerative or frayed labrums whereas SLAP repairs were performed in younger and more active patients with healthy-appearing labral tissue. There was only 1 failure in the tenodesis group, and in the SLAP repair group, there were 2 cases of postoperative stiffness; all were treated nonoperatively.
Conclusion: In this study, we show that both biceps tenodesis and SLAP repair can provide good to excellent results if performed in appropriately selected patients with isolated type II SLAP lesions.
Level of evidence: Level III, Retrospective Cohort Study, Treatment Study.

Keywords: SLAP lesion; superior labral repair; biceps tenodesis; labrum

The Partners Healthcare Institutional Review Board has reviewed and approved this study (IRB No. 2012P000567).

*Reprint requests: Jon J.P. Warner, MD, Harvard Shoulder Service, Massachusetts General Hospital, 55 Fruit St, Yawkey Bldg, Third Floor, 3G, Boston, MA 02114, USA.
E-mail address: jwarner@partners.org (J.J.P. Warner).

1058-2746/$ - see front matter © 2014 Journal of Shoulder and Elbow Surgery Board of Trustees.
http://dx.doi.org/10.1016/j.jse.2013.09.030

Since the original description by Andrews et al[2] in 1985 and the subsequent classification by Snyder et al[24] in 1990, there has been increasing recognition of superior labrum anterior-posterior (SLAP) lesions as a significant cause of shoulder pain, especially in the overhead athlete. Of the various types, type II SLAP lesions are the most common and are characterized by detachment of the superior labrum and biceps anchor from the superior glenoid.[23,24] However, the management of type II SLAP lesions is still somewhat controversial because various factors have been shown to potentially influence the outcomes of treatment, such as patient age, activity level, quality of the labral tissue, and concomitant pathology.[1,8,11,20,22]

The current surgical options for treatment of type II SLAP lesions commonly involve either superior labral repair or biceps tenodesis (or tenotomy). However, it is still unclear which patients would benefit from either procedure. Boileau et al[3] compared the outcomes between SLAP repair and biceps tenodesis for isolated type II lesions and reported that approximately 80% of patients in the tenodesis group were subjectively satisfied compared with only 40% of patients in the repair group. Moreover, 87% of athletes returned to their previous sporting level in the tenodesis group compared with 20% in the SLAP group. On the other hand, several previous studies have shown good to excellent results in up to 97% of patients after repair of SLAP lesions.[4,7,12,17] Interestingly, in a recent study, Denard et al[8] reported that increasing age (>40 years) may be a factor associated with poorer outcomes after repair of type II SLAP lesions, and they suggested that biceps tenodesis may be the more appropriate operation in this age group. This is further supported by a large prospective study by Provencher et al,[20] who showed that type II SLAP repair in patients aged older than 36 years was associated with a significantly higher risk of failure. These results are in contradistinction to the results of Alpert et al,[1] who showed no difference in clinical outcomes after type II SLAP repair in patients aged older than and younger than 40 years.

Given the general lack of consensus on the appropriate management of isolated type II SLAP tears, the aim of this study was to evaluate the indications for either superior labral repair or biceps tenodesis and compare the clinical outcomes of patients who have undergone either procedure for an isolated type II SLAP lesion. We hypothesize that both procedures provide significant improvement in shoulder function if performed in appropriately selected patients.

Methods

Patient selection

A retrospective analysis was performed of all patients who had undergone a superior labral repair or biceps tenodesis for an isolated type II SLAP lesion by the senior author (J.J.P.W.) between January 2008 and March 2011. Patients were included in the study if they showed both clinical and radiologic evidence of an isolated type II SLAP lesion. Patients with other types of SLAP lesions, such as types I, III, and IV, were excluded from the study. In addition, patients who had a concomitant rotator cuff repair or an anterior or posterior labral repair were also excluded, as were those who had associated pathology such as biceps tendinopathy or glenohumeral arthritis. Only patients with a minimum of 24 months of clinical follow-up were included in this study.

During the study period, a total of 125 patients were identified as having had some form of labral repair of the anterior, posterior, or superior labrum by the senior author (J.J.P.W.). A further 449 patients had a biceps tenodesis, of whom 72 had a tenodesis for documented labral pathology. After a careful chart review and analysis of operative reports and intraoperative photographs and videos, a total of 31 patients were identified as having either a superior labral repair or biceps tenodesis for an isolated type II SLAP lesion. Eighteen patients underwent biceps tenodesis, and thirteen patients had a superior labral repair.

At the time of latest follow-up, 3 patients in the tenodesis group were lost to follow-up. This left 15 patients with a mean follow-up period of 31 months (range, 26-43 months). The mean age at the time of surgery was 47 years (range, 30-59 years). There were 14 men and 1 woman, and the dominant shoulder was involved in 12 shoulders (80%). In the labral repair group, 3 patients were lost to follow-up, leaving 10 patients with a mean follow-up period of 35 months (range, 25-52 months). The mean age at the time of surgery was 31 years (range, 21-43 years). In this group all patients were men, and the dominant shoulder was involved in 9 patients (90%) (Table I).

Surgical technique

The decision to perform either a biceps tenodesis or a superior labral repair was determined both preoperatively and after intraoperative assessment of the status of the superior labrum. All operations were performed by the senior surgeon (J.J.P.W.). Patients were placed on the operating table in the beach-chair position and underwent a diagnostic arthroscopy through a posterior viewing portal. Through an anterior portal, which was made through the rotator interval above the subscapularis tendon, a probe was then inserted to assess the superior labrum. The arthroscopic criterion for a type II SLAP lesion was the ability to show clear separation of the superior labrum from the supraglenoid cartilage rim or a positive ''peel-back'' sign, as described by Burkhart and Morgan.[5]

The technique used for biceps tenodesis first comprised tenotomy of the biceps tendon at its superior labral attachment, followed by open subpectoral tenodesis by attaching the biceps tendon, at its musculotendinous junction, to the inferior aspect of the bicipital groove at the inferior margin of the pectoralis major tendon with a 2.9-mm suture anchor (Bioraptor; Smith & Nephew, Memphis, TN, USA). For the superior labral repair, in all cases, a trans-cuff portal was used to insert a double-loaded 2.9-mm suture anchor (Bioraptor) into the superior glenoid margin. Depending on tear configuration, the anchor was placed either beneath the biceps insertion or just posterior to it. One limb of each suture was then passed through the labrum with a 45° curved suture