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ORIGINAL ARTICLE

Failure following arthroscopic Bankart repair for traumatic anteroinferior instability of the shoulder: is a glenoid labral articular disruption (GLAD) lesion a risk factor for recurrent instability?

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Background: Recurrent instability is a frequent complication following arthroscopic Bankart repair. The purpose of this study was to investigate risk factors for poor patient-reported clinical outcome scores and failure rates.

Methods: Patients who underwent arthroscopic Bankart repair at least 2 years earlier were included. Preoperative and postoperative Single Assessment Numeric Evaluation; Quick Disabilities of the Arm, Shoulder and Hand; American Shoulder and Elbow Surgeons; and satisfaction scores were collected. The relationship of the following factors with outcomes and failure rates was assessed: (1) previous arthroscopic stabilization, (2) 3 or more dislocations prior to surgery, (3) glenoid labral articular disruption (GLAD) lesion, (4) concurrent superior labral anterior-to-posterior tear repair, and (5) concurrent biceps tenodesis.

Results: The study included 72 patients with a median age of 23 years (range, 14-49 years). Subsequent revision was required in 9 (12.5%); 1 additional patient (1.4%) had recurrent dislocation. Outcome data were available at a median follow-up of 3 years (range, 2-9 years). All scores significantly improved from preoperatively to postoperatively ($P < .05$); the mean patient satisfaction score was 9, with a median of 10 (range, 1-10). None of the analyzed factors were associated with worse postoperative outcome scores. GLAD lesions were significantly associated with a higher rate of failure ($P = .007$). No other analyzed factors had a significant association with failure rates ($P > .05$).

Conclusions: Patients with arthroscopic Bankart repair for traumatic anteroinferior shoulder instability had excellent outcomes, even in the context of previous arthroscopic stabilization surgery, 3 or more dislocations prior to surgery, concurrent superior labral anterior-to-posterior tear repair, or concurrent biceps tenodesis. However, GLAD lesions were associated with higher rates of failure, and the presence of a GLAD lesion may herald the presence of changes in the articular version or other as-yet-undetermined factors that could predispose patients to failure.

The institutional review board approved this study (Vail Valley Medical Center 2002-03).

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Recent rates of recurrent instability following arthroscopic Bankart repair have been reported to be as low as 15% in the short term,^{2,14,19,24,33,38} but several factors throughout the literature have been suggested to increase the risk of recurrent instability. These include younger patient age,^{3,11,16,17,25,37,38} male sex,^{28,31} higher number of preoperative dislocations,^{16,17,33} higher level of sports competition,^{3,8} lower number of suture anchors,^{3,31,32} bony glenoid defects of greater than 20% of the glenoid surface,^{3,6,12,18} off-track Hill-Sachs lesions,^{3,11,32,36,37} and increased ligamentous laxity,^{3,37} among others.

The clinical relevance of these risk factors is apparent. Over time, the recurrence rates of instability have significantly decreased. There are likely numerous reasons for this decrease, including improved implant systems and increased awareness and understanding of the surgical anatomy and risk factors among surgeons. However, these failure rates may not be extrapolated reliably to the midterm and long term, with studies reporting recurrence rates of up to 35%.^{1,36} Moreover, many of the conclusions of previous studies are contradictory, and none have found the critical factor for success following arthroscopic stabilization. In addition, success and failure are not only measured in terms of recurrent instability. More precisely, patients who do not have recurrence can still have unsatisfactory postoperative patient-reported outcome scores. This indicates that other undetected risk factors may be relevant to predicting an overall successful treatment.

Although some risk factors for recurrence and less satisfactory outcomes have been defined, many remain to be fully elucidated. Therefore, the aim of this study was to evaluate the contribution of several potential risk factors to both poor patient-reported clinical outcome scores and clinical failures. Our hypothesis was that clinical outcome scores would be significantly worse and failure rates significantly higher with previous stabilization surgery, 3 or more dislocations prior to index surgery, presence of a glenoid labral articular disruption (GLAD) lesion, concurrent superior labral anterior-to-posterior (SLAP) tear repair, and concurrent biceps tenodesis. Understanding the contribution of these factors will enhance appropriately guided surgical decision making to further curtail unfavorable patient outcomes.

Methods

Study population

This was a retrospective outcome study. The inclusion criteria were patients who underwent arthroscopic Bankart repair with a minimum of 3 suture anchors, who had undergone surgery at least 2 years earlier, and who had at least 1 traumatic anteroinferior shoulder dislocation, with the absence of an off-track Hill-Sachs lesion determined

intraoperatively. In addition, patients were not included if the length of the glenoid bone defect on sagittal imaging was greater than the radius of the glenoid.¹³ The exclusion criteria were patients with prior open stabilization surgery; patients who had contralateral shoulder multidirectional instability to exclude those with generalized laxity; patients with subsequent shoulder surgery unrelated to instability; or patients who underwent concurrent rotator cuff repair, distal clavicle excision, or acromioclavicular reconstruction at the time of Bankart repair. These exclusions were made because these injuries may confound outcome assessment.

Subjective evaluations were obtained with the Single Assessment Numeric Evaluation (SANE); Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH); American Shoulder and Elbow Surgeons (ASES); and satisfaction (10-point scale) scores preoperatively and at a minimum of 2 years postoperatively. The ASES score has been previously demonstrated as a reliable outcome measure for shoulder instability.²⁰ Additional questions on the evaluation form assessed instability. Clinical failures were defined as recurrent instability requiring revision surgery or as redislocation. A subjective feeling of subluxation was excluded from failures because patients may have difficulty distinguishing between pain and instability and thus the results can be misleading. Preoperative and postoperative outcome scores were compared for all patients in the study population. Among patients in whom failure did not occur, a subanalysis was performed in which associations between risk factors selected a priori and clinical outcome scores were assessed; clinical failures were excluded from this analysis to avoid the confounding effect of the failures on the assessment of the risk factors for lower outcome scores. The association between risk factors and clinical failure was also assessed. The size of our study population statistically limited the number of risk factors we may evaluate because repeatedly testing an excessive number of factors on a single dataset nearly guarantees the occurrence of type I (false-positive) errors. Therefore, we selected only 5 risk factors a priori for assessment in this study: previous instability surgery, 3 or more dislocations prior to index surgery documented by clinical records, presence of a GLAD lesion (Figs. 1 and 2), concurrent SLAP tear repair documented at index surgery, and concurrent biceps tenodesis at index surgery. The size of each GLAD lesion was also measured as the largest axial and sagittal span of the lesion on preoperative magnetic resonance imaging.

Surgical technique

All operations were performed arthroscopically using general anesthesia with additional interscalene nerve blocks, with the patient placed in the beach-chair position. Examination under anesthesia was performed to assess for instability. The operative extremity was placed in a pneumatic arm holder, and the shoulder was prepared and draped using sterile technique. Diagnostic arthroscopy was then performed using a standard posterior viewing portal and both 30° and 70° arthroscopes. A standard anterior working portal was established, and extensive labral débridement was then performed. After creation of an anteroinferior working portal, Bankart repair was per-

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