Results of Modified Latarjet Reconstruction in Patients With Anteroinferior Instability and Significant Bone Loss

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Purpose: The purpose of this study was to analyze the results of the modified Latarjet procedure for shoulder instability associated with an inverted-pear glenoid (bone loss of at least 25% of the width of the inferior glenoid) or an engaging Hill-Sachs lesion. **Methods:** From March 1996 to December 2002, 102 patients underwent an open Latarjet procedure for shoulder instability with an inverted-pear glenoid, with or without an associated engaging Hill-Sachs lesion, by the 2 senior authors (S.S.B. and J.F.D.), and 47 of them were available for follow-up physical examination. The remaining 55 patients were contacted by telephone or letter to see if they had had recurrent dislocation or subluxation. The mean age of the patients was 26.5 ± 6.6 years (range, 16 to 41 years). There were 46 male patients and 1 female patient. Preoperatively, mean forward elevation was 177.2° ± 13.6° (range, 90° to 180°) and mean external rotation with the arm at the side was 55.3° ± 16.1° (range, 0° to 80°). All patients had a positive apprehension sign preoperatively. The median number of dislocations before surgery was 6, with 20 patients having had more than 15 dislocations preoperatively. **Results:** The mean follow-up time for the 47 patients who were personally examined was 59.0 ± 18.5 months (range, 32 to 108 months). Postoperatively, mean forward elevation was 179.6° ± 2.0° (range, 170° to 180°; gain of 2.4°) and external rotation with the arm at the side was 50.2° ± 12.6° (range, 22° to 78°; loss of 5.1°). As for postoperative functional scores, the mean Constant score was 94.4 and the mean Walch-Duplay score was 91.7. None of these 47 patients showed any further dislocation, and 1 of them still had a positive apprehension sign (2.2%) indicating subluxation. However, 4 patients out of the total 102 who underwent the modified Latarjet procedure had a recurrence. With 4 recurrent dislocations and 1 recurrent subluxation, there was a 4.9% recurrence rate. The 4 patients with recurrent dislocations were not among the 47 who returned for personal follow-up evaluation. **Conclusions:** The 2 senior authors (S.S.B. and J.F.D.) have previously reported an unacceptably high recurrence rate (67%) for arthroscopic Bankart repair in the presence of an inverted-pear glenoid with or without an engaging Hill-Sachs lesion. They have recommended an open modified Latarjet procedure in such patients. The present study confirms the validity of that recommendation, because the same 2 surgeons have had only a 4.9% recurrence rate in that same category of patient at a mean follow-up of 59 months. Furthermore, the results of this study show the efficacy of the modified Latarjet procedure in the extremely challenging category of patients who present with such dramatic bone loss that soft-tissue reconstruction, either open or arthroscopic, is not a reasonable option. **Level of Evidence:** Level IV, therapeutic case series. **Key Words:** Shoulder—Shoulder instability—Bankart repair—Bone graft—Latarjet reconstruction—Instability repair.

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In our experience arthroscopic stabilization has proven to be a very satisfactory means of treatment for traumatic anteroinferior instability in all but one category of patients: those with significant bone loss involving the glenohumeral joint. We have defined significant glenohumeral bone defects as follows[1]: *inverted-pear glenoid*, in which there is a greater than 25% loss of the inferior glenoid diameter, or *engaging humeral Hill-Sachs lesion* (i.e., a Hill-Sachs lesion that engages the anterior glenoid rim with the shoulder in a position of 90° abduction and 90° external rotation).

The 2 senior authors (S.S.B. and J.F.D.) have previously reported, in a series of 194 patients with arthroscopic suture anchor Bankart repair, a recurrent

instability rate of 4% in patients without significant bone deficiency.[1] In contrast, the 21 patients in that report who displayed significant bone deficiency had a 67% recurrent instability rate. Given the unacceptably high rate of recurrent dislocation and subluxation after arthroscopic repair in the presence of bone deficiency, the 2 senior authors abandoned arthroscopic repair in bone-deficient patients and began performing their modified version of the Latarjet procedure in this category of patients. The Latarjet procedure,[2-6] devised by Professor M. Latarjet in the 1950s,[2] uses a large coracoid bone graft to extend the glenoid articular arc, stabilizing the shoulder by means of a lengthened bone platform plus the sling effect of the conjoined tendon rather than by soft tissue alone.

The purpose of this study was to investigate the results of open Latarjet reconstruction of a cohort of patients with significant glenoid bone stock deficiency (inverted-pear glenoid) or humeral bone stock deficiency (engaging Hill-Sachs lesion) (or both).

METHODS

Data Analysis

Institutional approval was obtained for this study. From March 1996 to December 2002, 102 patients underwent an open modified Latarjet procedure for shoulder instability associated with inverted-pear glenoids or engaging Hill Sachs lesions (or both). These were consecutive cases of anterior instability that satisfied the criteria for significant bone deficiency as defined previously in this report. Forty-seven of these patients returned for follow-up evaluation and examination. We were able to contact all 55 of those who could not return for follow-up, by telephone or mail, to determine whether they had had any recurrent dislocations or subluxations. Except for the report of recurrences, this study deals with the 47 patients who returned for follow-up examination. At follow-up examination, we determined functional status by means of 2 functional scoring systems: the Constant score[7] and the Walch-Duplay score.[8]

The mean age of the patients was 26.5 ± 6.6 years (range, 16 to 41 years). There were 25 right and 22 left shoulders. The dominant side was injured in 28 patients. There were 46 male patients and 1 female patient. Of the 102 patients, 55 were contact athletes (either rugby or American football). The other patients all sustained traumatic dislocations by non-athletic accidents.

Preoperatively, mean active forward elevation was 177.2° ± 13.6° (range, 90° to 180°) and external rotation with the arm at the side was 55.3° ± 16.1° (range, 0° to 80°). Preoperative and postoperative range of motion was measured at various times by one of the authors without the use of a goniometer.

All patients had a positive apprehension sign preoperatively. The median number of dislocations before surgery was 6. Of the patients, 18 (38.3%) had 1 to 3 dislocations, 9 (19.2%) had 4 to 10, 15 (31.9%) had 15 to 50, and 5 (10.6%) had more than 50.

Preoperative Radiographs

Preoperative studies included plain radiographs in the anteroposterior (internal and external rotation), axillary, outlet,[9,10] 30° caudal tilt,[10] Stryker notch,[11] West Point,[12] and Bernageau[13] views. Although the axillary, West Point, and Bernageau views often gave a qualitative sense of glenoid bone loss, that loss could not be quantified radiographically. Similarly, the Stryker notch view and the anteroposterior view in internal rotation gave only a subjective impression of the Hill-Sachs lesion. Bone loss was quantified by arthroscopic assessment done immediately before open surgery. Glenoid bone loss was identified by arthroscopic measurement of the inferior glenoid diameter, as well as comparison of the anterior and posterior radius measurements from the bare spot of the glenoid; engaging Hill-Sachs lesions on the humeral side were identified by dynamic arthroscopic evaluation upon bringing the arm into a position of 90° abduction and 90° external rotation.[1] We noted arthroscopically the most extreme situations of glenoid bone loss that had progressed beyond the inverted-pear glenoid and termed this extremely bone-deficient glenoid a *banana glenoid*.

Surgical Procedure

Each patient in this series underwent diagnostic arthroscopy for the purpose of quantifying bone loss and identifying concomitant pathology (e.g., SLAP lesions) that would need to be addressed arthroscopically before open surgery. Diagnostic arthroscopy was performed with the patient in the lateral decubitus position, by use of the Star Sleeve Suspension System (Arthrex, Naples, FL) with 5 to 10 lb of balanced suspension. Posterior, anterior, and anterosuperior portals were established. Glenoid bone deficiency was quantitatively evaluated while viewing through an anterosuperior portal while a calibrated probe was introduced through a posterior portal. The shape of the glenoid was assessed to see if it approximated an