

Surgical repair of bankart lesion in recurrent shoulder dislocation: a comparative and retrospective study between open and arthroscopic technique

Abstract

Objective: to compare the functional results obtained from the arthroscopic and open techniques for the Bankart lesion in recurrent shoulder dislocation.

Methods: a retrospective study comparing the results obtained with a minimum follow-up of two years in 76 patients (50 underwent arthroscopic repair and 26 had open repair performed). The results were obtained through ASES score (American Shoulder and Elbow Surgeons Score) and DASH score (Disabilities of the arm, shoulder and hand, and then analyzed using the Student's t-test.

Results: 76 patients met the criteria for inclusion in the study, 65.8% (n = 50) had arthroscopic repair and 34.2% (n = 26) had open technique. 89% were men and 11% were women. The minimum follow-up time was 2 years. The mean age of the patients was 27.3 years. Among the patients, 31 were manual workers (39.2%) and 34 (43%) participate in recreational contact sports. The recurrence rate was 6% (3 patients) in the arthroscopic group and 3.8% (1 patient) in the open surgery group. The arthroscopic repair group achieved 94% of good and excellent results by ASES score and 92% of good and excellent results by DASH score. The open repair group achieved 92.3% of good and excellent results by ASES score and 96.1% by DASH score. Comparison between groups using DASH and ASES scores did not show a statistically significant difference, with $p = 0.319$ for DASH score and $p > 0.05$ for ASES score.

Conclusion: The treatment of Bankart lesion in recurrent shoulder dislocation achieved good and excellent results in more than 90% of the cases using either arthroscopic or open techniques. Although arthroscopic surgery is the treatment of choice for most surgeons nowadays, the open repair remains an excellent option and should not be forgotten.

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Osvre Lech, Paulo Piluski, Carlos Castillo, Duddley Zanella, Lisro Jara

Universidade Federal da Fronteira Sul, Instituto de Ortopedia e Traumatologia, Brazil

Correspondence: Osvandre Lech, Shoulder and Elbow Service, Universidade Federal da Fronteira Sul, Hospital Sao Vicente de Paulo, Instituto de Ortopedia e Traumatologia, Passo Fundo, Brazil, Email lech.med@terra.com.br

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Introduction

Since Bankart described the injury of the antero-inferior lip of the glenoid rim as the cause of instability and presented his results with patients treated surgically through open repair, it became the "gold standard" treatment for this lesion.^{1,2} Over the last few decades, the arthroscopic technique for repairing Bankart lesion has evolved considerably, in an attempt to reduce the common criticism of open repair, such as wide incision and dissection, loss of external rotation, postoperative pain, subscapularis desinsertion and secondary osteoarthritis.³

Despite the great evolution of the arthroscopic technique, the literature shows that controversy remains between the two types of treatment. The initial results of arthroscopy repair were disappointing with recurrence rates up to 50%, related mainly to the learning curve, inadequate surgical material and lack of understanding of the pathology, as bone loss and capsular laxity.⁴ A better understanding of the various types of labral tears, associated bony lesions (Hill-Sachs, Bony Bankart) and the evolution of implant material has made the arthroscopic repair a more reliable procedure lowering its recurrence rate.

The aim of this study is to evaluate the results of arthroscopic and open repair repair of Bankart lesions in post-traumatic shoulder dislocation with minimum follow-up of 24 months, compare the recurrence rate and return to pre-trauma activities between them,

through ASES (American Shoulder and Elbow Surgeons Score) and DASH (Disabilities of the arm, shoulder and hand) scores.

Materials and methods

A retrospective study of 76 patients treated by arthroscopic or open repair of the Bankart lesion in the recurrent shoulder dislocation between January 2004 and December 2014 at the Hospital Sao Vicente de Paulo, Instituto de Ortopedia e Traumatologia, Passo Fundo, Brazil. All surgeries were performed by shoulder surgeons.

The Inclusion criteria were:

- Patients with anterior traumatic instability;
- Bony lesions isolated from glenoid or Hill Sachs defect smaller than 25%;
- Primary lesion of the anterior and inferior glenoid border.

The exclusion criteria were:

- Those who did not follow the rehabilitation protocol;
- Less than 2 years follow-up;
- Incomplete medical records;
- Reoperation;
- Previous surgeries.

76 patients were selected; of those, 50 were operated on by the arthroscopic technique and 26 by the open standard technique. Data were obtained by medical records and phone call. The results were analyzed using ASES (American Shoulder and Elbow Surgeons Score) and DASH (Disabilities of the arm, shoulder and hand) scores. The arthroscopic technique included: brachial plexus block associated with general anesthesia, beach chair position, examination under anesthesia to check laxity and the direction of dislocation.

Standard posterior and two anterior portals, identification of the Bankart lesion, debridement of the antero-inferior glenoid bone and release of the capsule and labrum. A variable number of biodegradable anchors were inserted for capsule repair, and correction of laxity when necessary. The open technique included: brachial plexus block associated with general anesthesia, beach chair position, examination under anesthesia to check laxity and the direction of dislocation. A 5-7 cm deltopectoral approach. Incision of the subscapularis and the capsule 1-2cm medial to its insertion. Identification of the Bankart lesion and debridement of the anterior and inferior aspects of the glenoid with release of the medialized capsule and labrum. Biodegradable anchors were placed along the lesion. The labral reconstruction is then performed with tensioning when necessary. Capsule and subscapularis are then closed with the arm in neutral rotation.

The rehabilitation protocol included: (1) immobilization in a sling for 3-4 weeks, according to the size of the lesion and laxity; (2) hand and elbow range of motion starts in the first post-op day; (3) scapular muscles stretching with sling, and pendulum exercises start usually in the first 7-10 days; (4) physiotherapy to gain mobility and strength starts after the fourth week; (5) strenuous exercises are allowed after 3 months and return to sports, depending on the degree of contact, is allowed after 4-5 months.

Results

Of the 76 patients who met the criteria for inclusion in the study, 65.8% (n = 50) were operated by the arthroscopic technique and 34.2% (n = 26) by open technique; 89% were men and 11% were women, showing a clear predominance of the Bankart lesion in males. The minimum follow-up was 2 years with a mean of 4.4 years and an interval of 2 - 10 years. The mean age of the patients was 27.3 years at the time of surgery (16-73 years), where 20.2% were less than 20 years old and 31.6% were between 25 and 30 years old. The dominant side was affected in 65.8% and the incidence on the right side was 63.2%. The first episode of dislocation occurred in 45.5% of the patients with less than 20 years. The mean time between the first dislocation and surgery was 63.2 months. When the dominant side was affected, the time between the first dislocation and surgery was lower (mean 53 months) than the non-dominant side (mean 82.2 months). Also, the number of dislocations necessary for the patient seeks for specialized orthopedic assistance was lower when the dominant side was involved. Among the patients, 31 were manual workers (40.1%) and 34 (44.7%) practiced recreational contact sport. The two most frequent associated lesions were Superior Labrum Anterior Posterior - SLAP (7 cases, 9.2%) and complete rotator cuff tear (5 cases, 6.6%). The recurrence rate in the arthroscopic group was 6% (3 patients) and 3.8% (1 patient) in the open repair group. All the post-op dislocations have happened after traumatic episodes.

The arthroscopic repair group achieved 94% of good and excellent results by ASES score and 92% of good and excellent results by DASH score (Tables 1 & 2). The open repair group achieved 92.3% of good and excellent results by ASES score and 96.1% by DASH

score. There was no statistically significant difference between the groups by the DASH and ASES scores (Table 3), and the mean scores were not different between the analyzed groups. Therefore, based on this study, the choice between open or arthroscopic techniques does not seem to interfere in the postoperative functional scores, since the "p" value does not show a statistically significant difference between the techniques.

Table 1 Comparison of Dash Score Results between Groups of Open and Arthroscopic Repair

Group	N	Mean (\pm SD*)	Median (25/75)
Open	26	2,34 (2,79)	1,60 (0.15/2.70)
Arthroscopic	50	3,04 (5.93)	1,60 (0,01/2.50)
Total	76	2,80 (5.07)	1,60 (0.01/2.50)

Mann-Whitney Test (p=0.319)

*Standard deviation

Table 2 Distribution of Dash Score Results between Groups of Open and Arthroscopic Repair

Group	N	Mean Rank	Sum of Ranks
Open	26	41,92	1090,00
Arthroscopic	50	36,72	1836,00
Total	76		

Tables 3 Distribution of ASES Score Statistical Analysis Results Between groups Of Open and Arthroscopic Repair

	Age	ASES
Mann-Whitney U	572,000	600,500
Wilcoxon W	923,000	951,500
Z	-,878	-,669
Asymp. Sig. (2-tailed)	,380	,503

Discussion

The open repair for Bankart lesion of anterior shoulder instability is still considered the gold standard by many surgeons.^{1,2} The arthroscopic repair was developed to obtain similar or even better results when compared to the open technique. It includes shorter hospital stay, lower postoperative pain, earlier rehabilitation and a faster return to pre-trauma activities.³ The initial results of arthroscopy were disappointing, with a recurrent rate of up to 49% using the Caspari's transglenoidal suture. With the anchor technique, the results were better and the recurrence rate dropped considerably between 9 to 21%, but still higher than the open technique. Due to technical advances combined with an increased understanding of the factors leading to recurrent instability, the results of Bankart arthroscopic repair have improved significantly and now can be compared with the results of the open technique.

Mohtadi et al.⁶ report 11% rate of recurrence in open procedures and 23% in arthroscopic procedures, and related that functional result does not present a statistically significant difference. In the study, the recurrence rate in the arthroscopic group was also superior to those operated by the open group and the final functional result did not present a difference with statistical significance between both techniques. On the other hand, Kim et al.⁷ obtained similar results regarding recurrence and better functional results in the arthroscopic group, comparing the open and arthroscopic technique, using anchors in both groups; there was also a higher incidence of residual instability in patients with fewer anchors, recommending the use of at least three anchors.

According to Fabbriani & Bottoni,⁸ in a prospective randomized study evaluated by Rowe and Constant scores, the arthroscopic repair

was as effective as open. Field et al.⁹ compared two groups of similar patients (50 open vs 50 arthroscopic) and found a recurrence rate of 8% in the arthroscopic and 0% in open surgery. Weber et al.¹⁰ presented 16.3% recurrence rate in the arthroscopic group versus 3.7% in the open group. Similarly, a recent retrospective study by Wang et al.¹¹ showed no statistically significant difference in functional outcome between the open vs. arthroscopic groups. Petrera et al.¹² performed a meta-analysis comparing the two techniques, the recurrence rate and reoperation rate were lower in patients undergoing arthroscopic treatment, but was not statistically significant. Chalmers P et al.¹³ through a systematic meta-analysis review concluded that there is no difference between the two techniques in relation to failure rates. Lädermann et al.¹⁴ in a prospective study, concluded that regardless of the surgical technique used, there is no evidence that such treatments effectively correct glenohumeral translation, leaving a residual microinstability that may be the cause of residual pain, persistent apprehension and arthrosis, but further studies are needed to better understand residual microinstability. Antunes JP et al.¹⁵ observed good results in patients with arthroscopic Bankart repair and recurrence rate of 7%, with a higher risk in young patients with ligament laxity, concluding that arthroscopic repair is a reliable method.

Antero-inferior gleno-humeral bone defects are common in shoulder instability and are strongly correlated with recurrence of dislocation, and failure of arthroscopic Bankart repair. Most authors agree that open surgery should be considered in the presence of certain conditions, such as glenoid bone loss equal or greater than 25%, Hill-Sachs impaction fracture involving more than 30% of the humeral head, even without bipolar injury.^{6,8,9,12,13} A careful image evaluation should be performed in order to identify, quantify and characterize these bone defects.

Conclusion

We conclude that repair of the Bankart lesion in the recurrent shoulder dislocation by the arthroscopic and open repair has good results in more than 90% of the cases and that there was no statistically significant difference between groups, according to DASH and ASES scores. Although arthroscopic surgery is the choice for most surgeons nowadays, open repair still remains an excellent option and should not be forgotten.

Acknowledgments

None.

Conflicts of interest

None.

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