ANTERIOR INSTABILITY OF THE SHOULDER. RETROSPECTIVE STUDY ON 159 CASES

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ABSTRACT

Objective: To analyze the results of 159 patients with anterior instability of the shoulder submitted to arthroscopic treatment from January 2001 to December 2005. Methods: Retrospective study of complete patient records. Results: In 108 patients the Bankart lesion was found, while in 62 patients, SLAP type lesions were found. An average of 2.7 anchors was used. 42 cases presented complications; 14 had pain on effort, 12 had some degree of reduction of external rotation, and 16 had recorrence. The patients who developed complications used an average of 2.5 anchors, while those without complications used an average of 2.8 anchors ($p<0.05$). Of the 35 patients with anterior glenoid bone lesion, 8 had recorrence, while of the 124 patients without fractures, 8 had recorrence ($p<0.05$). Of the 113 patients with first-time traumatic dislocations, 12 developed limitation of external rotation, while in 46 atraumatic cases none developed limitation ($p<0.05$). Of the patients with SLAP lesion, 11 developed pain, while in the cases without this lesion, only 3 presented pain ($p<0.05$). Conclusion: There were more recurrences (deveria ser plural e recurrences, nao recurrence) in cases of anterior glenoid bone lesion. Post-operative pain was more frequent when the lesion type was SLAP. Limitation of external rotation is associated to traumatic instability.

Keywords: *Arthroscopy. Joint instability. Shoulder. Retrospective studies.*

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INTRODUCTION

Anterior glenohumeral instability is the most common instability of the glenohumeral joint. Several studies show the importance of the anteroinferior capsuloligamentous structures in the maintenance of joint stability.[1-4] The glenoid labrum is an important stabilizing structure, increasing the congruity of the glenoid cavity in relation to the humeral head and, in its anteroinferior portion, serves as an anchorage point for the inferior glenohumeral ligament, which is the last stabilizing element of the shoulder in the position of abduction and external rotation. Perthes[5] was one of the first to describe the avulsion of these structures from the anterior edge of the glenoid as being the cause of recurrent dislocations. Bankart[6] later describes the same lesions and the principle of the treatment of shoulder instability that consists of the repair of these lesions, restoring the anatomy of the capsulolabral ligamentous complex.

Biomechanical studies and intraoperative findings showed that in shoulder instability, the Bankart lesion is present in approximately 80% of the cases.[7,8] The treatment recommended for cases of recurrent dislocations, and according to some authors, after traumatic first-time dislocation in youths (when recurrence rates reach 80%)[7] is surgery. This intervention was traditionally performed by open surgery, with good results and a low rate of recurrence.[9,10] The disadvantages of this technique in relation to the arthroscopic technique are: greater surgical aggression leading to greater adherence and consequent decrease of external rotation; weakness of the subscapularis tendon, due to the need for its approach; greater chance of lesion of the axillary nerve and risk of infection.[11]

Arthroscopy, due to its lesser surgical aggression and low morbidity, became the most widely indicated procedure in the treatment of shoulder instability. The methods of fixation of the capsulolabral ligamentous structures were initially inadequate, leading to high rates of recurrence. With the technological development of new surgical materials (fixation anchors and suture-passing devices) and with the actual advance of arthroscopic surgical techniques, today it is possible to reproduce the repair of lesions in a manner similar to that performed by open surgery.[12-15]

Nowadays, the use of arthroscopy is preferred for the treatment

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of anterior instability of the shoulder, in the majority of cases, while it is contraindicated in the presence of significant bone lesions (inverted pear glenoid and the Hill-Sachs lesion of the engaging type).[16]

The aim of this study was to evaluate the result of surgeries performed by arthroscopic route in our service, on patients with anterior instability without significant bone lesion.

MATERIALS AND METHODS

A total 190 patients were evaluated retrospectively, thorough review of medical records. All of them exhibited anterior instability of the shoulder, having undergone surgical treatment by arthroscopic route, as a first option, in the period from January 2001 to December 2005. The data were collected in the period from October 2006 to January 2007.

All the medical records included in the protocol presented the following information: date of birth of the patient, date of the surgical procedure, medical history with well characterized report of the profile of traumatic or atraumatic instability, complaints of pain and functional limitation; preoperative physical exam with active search for signs of instability, result of the preoperative imaging exams, surgical description with articular inspection and search for bone, capsular, rotator cuff and SLAP lesions and number of anchors used, postoperative evaluation with at least 12 months of follow-up seeking complaints, clinical signs and signs of functional limitation and of external rotation, instability and pain at the physical exam.

All the patients were submitted to radiographies. Supplementary exams were also conducted on a routine basis, varying between Magnetic Resonance (the majority), Arthro-MRI and Arthrotomography. (Ammex 1)

We adopted the following criteria to contraindicate the arthroscopic repair of anterior glenohumeral instability: bone loss above 25% of the glenoid, lesion of the articular surface of the humeral head (evaluated by tomography) coming into contact with the anterior edge of the glenoid with the ability to reproduce the dislocation position and lesion due to avulsion of the inferior glenohumeral ligament of the anatomic neck of the humerus.

All the patients were operated in the beach chair position. The arthroscopic portals used were the conventional ones (posterior, anterior and anterolateral), with continuous irrigation flow. Initially all the structures were systematically inventoried. We performed the capsulolabral release of the glenoid neck, followed by the debridement of the labial edge. The next stage was the gentle bloodying of the edge and of the neck of the glenoid, followed by the placement of two to four anchors (mostly metallic), depending on the lesion size, with non-absorbable multifilamentary wire, at the limit of the articular surface of the glenoid, performing the suturing with the capsulolabral tissue. The capsuloplasty was performed when there was capsular laxity, eliminating the redundancy of the inferior capsule.

When present, the unstable SLAP lesion was initially approached with debridement at the long head of the biceps, and fixed with one or two anchors positioned between 11 and 1 o'clock.

All the patients had the same rehabilitation protocol. During the first three weeks, shoulder immobilization was maintained with the Velpeau splint, and work was started on movement of the wrist and elbow; only pendular movements of the shoulder were permitted. After this period, passive movements were started, and external rotation beyond 20° was only allowed after the sixth week. Strengthening exercises were started when the range of motion grew close to normal, at around 3 months, and return to activities occurred at around 5-6 months.

Ammex 1. *Data that should be contained in the medical records.*

Preoperative evaluation
Age
Gender
Type of instability (traumatic or atraumatic)
History of pain, functional limitation or instability.
Physical examination with pain, functional limitation or instability.
Preoperative exams
Radiographies – Always
Resonance, Arthro-MRI or Arthrotomography.
Tomography – evaluate bone lesion when necessary
Surgical description
Search for bone, capsular, rotator cuff and SLAP lesions.
Number of anchors used
Postoperative evaluation with at least 12 months of follow-up
History of pain, functional limitation or instability.
Physical examination with pain, functional limitation or instability.

A protocol was drawn up for the data gathering that was supposed to be completed upon the analysis of each medical record containing predetermined information. Twenty-one patients were excluded from the analysis of results as they presented incomplete data in their medical records, with a remaining 159 cases. One hundred forty-seven patients (92.5%) were men and 12 (7.5%) women; 113 (71%) had a first traumatic episode and 46 (29%) an atraumatic one; 19 patients were operated after the first episode of dislocation. Age ranged from 16 to 71 years (average 29); the postoperative follow-up time ranged from 12 to 72 months (average of 37 months).

During the evaluation of the postoperative data we considered the subjective reports of the patients that complained about pain, limitation in everyday activity, sensation of insecurity and new episodes of dislocation and subdislocation, besides objective data of physical examination with specific tests to assess instability and range of motion. There was no re-summoning of the patients, but only those that presented this information clearly described in an outpatient return visit at least one year into the postoperative period were included in the protocol.

The data obtained were systematically compared seeking a relationship of causality and the statistical validation was by the chi-square test and by Fisher's exact test in the case of the qualitative variables and by the t-test with two samples assuming different variances for the quantitative variables.

RESULTS

The Bankart lesion was present in 108 (69%) patients and in 62 (39%) there was association with the SLAP lesion. An average of 2.7 anchors, most of which were metallic, was used per

patient. Forty-two patients (26.5%) had the following complications: 14 (8.8%) experienced pain upon effort; 12 (7.5%) evolved with some degree of reduction of external rotation; 16 (10%) exhibited recurrence (10 – 6.2% - with signs of apprehension without dislocation and 6 – 3.8% - with dislocation). The cases that evolved with recurrence used 2.5 anchors on average, while in those in which there was no recurrence the mean value was 2.8 anchors. In the patients in which the first episode was traumatic 12 (10.6%) had recurrence, and when atraumatic four experienced recurrence (8.6%). Among the patients operated after the first episode of dislocation only one (5.2%) presented recurrence. In those that underwent arthroscopy and experienced several dislocation episodes, 15 (10.7%) presented recurrences. In the patients with Bankart lesion, 14 (13%) presented recurrences or signs of instability. In those without this lesion only two (3.9%) complained about recurrences. In the patients with bone lesion of the anterior edge of the glenoid (35) eight (22.8%) experienced recurrence, and without this lesion eight (6.4%) of 124 patients had recurrences ($p<0.05$). (Table 1) In those with first-time traumatic dislocation (113) 12 (11.9%) evolved with some type of external rotation limitation, while those with atraumatic first-time dislocation (46) did not have this type of limitation ($p<0.05$). (Table 2) In the patients with associated SLAP lesion (62) submitted to the arthroscopic treatment of this lesion, 11 (17.7%) presented pain in the postoperative period. In the group without this lesion (97), only three (3.1%) had pain ($p<0.05$). (Table 3)

Table 1. *Relationship between the presence of bone lesion of the anterior edge of the glenoid and postoperative recurrence.*

	Stable	Recurrence	Total
Glenoid Bone Lesion	27	8	35
Without Bone Lesion	116	8	124
Total	143	16	159
x2=	6.406		
p=	0.011		

Table 2. *Relationship between the type of instability (traumatic vs. atraumatic) and limitation of postoperative external rotation.*

	Without limitation	With limitation	Total
Traumatic	101	12	113
Atraumatic	46	0	46
Total	147	12	159
x2=	3.871		
p=	0.049		

Table 3. *Relationship between the presence of SLAP lesion and postoperative pain.*

	No pain	pain	Total
Slap present	51	11	62
Slap ausent	94	3	97
Total	145	14	159
x2=	8.367		
p=	0.004		

DISCUSSION

In this study the patients were not preselected with a basis on their physical activity, degree of instability, time of illness or associated pathological findings, thus we presented a heterogeneous group in order to be able to stratify the results according to the multiple variables and to identify factors related to the poor results.

We observed 10% of recurrence, which corresponds to the mean value encountered in literature that ranges from 8 to 18.5%.[17]

As described in previous studies, bone lesion (both on the anterior edge of the glenoid and in the humeral head) significantly increases the rates of recurrence.[16,18,19] Patients that had bone lesion of the anterior edge of the glenoid presented a significantly higher number of recurrences – 22.8%(8/35) as opposed to 6.4%(8/124) ($p<0.05$).

Although it did not prove possible to statistically demonstrate the relation between the number of anchors and postsurgical recurrence, patients that experienced recurrence used 2.5 anchors and those without recurrence used 2.8 anchors on average, coinciding with other studies that describe the importance of a higher number of anchors for the success of the treatment.[17]

There was no significant difference between the traumatic and atraumatic types as regards recurrence (10.6 against 8.6%), and such a fact is possibly due to the selection criteria for arthroscopic treatment, which excluded patients with important bone lesions, more prevalent in the individuals with traumatic episodes of dislocation.[18]

We found greater limitation of external rotation, in the postoperative period, in the cases of traumatic instability ($p<0.05$). We attribute this fact to an intrinsic condition of the capsuloligamentous tissue that is characteristic in patients with atraumatic instability.[16,20] Although they were submitted to capsuloligamentous retensioning, they may present greater tissue accommodation during the rehabilitation period when compared with those that have traumatic instability.[19] Although capsuloligamentous retensioning is not necessary in cases of traumatic instability, some authors indicate this procedure due to plastic deformity in this ligamentous structure.[18,21,22] However, during Bankart repair the capsuloligamentous complex is automatically tensioned. It is up to the surgeon, during the operation, to evaluate the need to associate greater tensio-

ning for greater correction of laxity. The correct tensioning, often difficult to quantify, is the key to avoiding limitation of external rotation.

Pain in the postoperative period may be related to the repair of the SLAP lesion associated with the repair of the Bankart lesion. We found this type of complaint in 17.7% of the patients submitted to repair of the SLAP lesion ($p<0.05$). Although some studies show that postoperative pain can be a complaint in patients submitted to isolated repair of the SLAP lesion[23], we did not encounter this type of finding in literature when the repair of the SLAP lesion was associated with the repair of the Bankart lesion. Authors also declare that the pain may be related to other undiagnosed lesions such as partial ruptures of the rotator cuff and degenerative joint alterations.[24,25,26] However, we did not find these lesions in our cases.

Thus the treatment of glenohumeral instability should prioritize the stabilization of Bankart's lesion and the correction of capsular laxity, whereas the use of anchors is indispensable for the good outcome of the procedure. The selection of cases, the correct identification of associated lesions and the quality of the capsular tissue are the key to the success of arthroscopic treatment, and the repair of all the lesions of soft parts is essential to preserve the congruity and correct function of the joint.

CONCLUSION

We concluded that in arthroscopic treatment of anterior instability of the shoulder:

There is a higher rate of recurrence in the presence of fractures of the anterior edge of the glenoid.

Postoperative pain is related to the presence of the SLAP lesion.

Limitation of external rotation in the postoperative period is related to the type of instability (traumatic).

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