

Traumatic labral tears: An unknown cause of chronic shoulder pain

J. Barth¹, R. Barthelemy², B. Rubens-Duval³, P. E. Colle⁴, D. Saragaglia³

ABSTRACT

Among 83 arthroscopies performed from January 2005 to July 2006, seven patients (two female and five male) complained about chronic shoulder pain after an initial shoulder trauma without dislocation. The mean age was 31 years (range, 23-38). None of the patients suffered from stiffness. Only one patient was found with a true apprehension sign, but all the patients presented with pain during this test. The mean preoperative Constant score was 74.4/100 (range, 59-81); the mean pain score was 3.9/15 (range, 1.5-6); the mean activity level score was 9/20 (range, 6-12); the mean mobility score was 39.6/40 (range, 38-40); the mean strength score was 22/25 (range 10-25). Arthro-CT scans were performed in all cases and revealed a labral lesion. After an initial period of conservative treatment (mean 13.3 months, range 8-22 months), shoulder arthroscopy was scheduled. The gleno-humeral investigation showed one isolated anterior Bankart lesion with a Hill Sachs lesion and a glenoid bony Bankart lesion, two double anterior and posterior Bankart lesions, one triple anterior + posterior Bankart + type II SLAP lesion and three isolated type II SLAP lesions. Arthroscopic repair was undertaken if a labral lesion was confirmed during diagnostic arthroscopy. Our lack of follow-up did not allow us to draw early conclusions. But we were concerned about the delay before recovering a full range of motion. If conservative treatment fails, computerized tomography or magnetic resonance imaging using injected contrast seems to better detect these lesions. Moreover, diagnostic arthroscopy could be performed. Arthroscopic procedures such as Bankart repair with minimal capsular shift and type II SLAP repair with minimal tension may be considered if the lesions are confirmed.

Key words: Painful and unstable shoulder, SLAP lesion, labral tear, chronic shoulder pain

INTRODUCTION

Some patients suffer from chronic shoulder pain after an initial shoulder trauma that does not involve dislocation. The routine clinical examination is often inconclusive. When questioned, the patient describes no true dislocation or subluxation. Therefore, the initial diagnosis is contusion of the shoulder, especially since X-rays reveal an absence of any fracture. However, these patients may present again, with a chronic painful shoulder, after several months of unsuccessful rehabilitation program. Magnetic resonance imaging (MRI) scans can be negative as well. Moreover, patient status with work compensation could be misunderstood by the physician, and patients often

visit several physicians before any labral tear is suspected and treated. We present our series of cases to illustrate this confusing pathology. Correlation between anatomic lesions and symptoms, and our early results (preliminary series) are discussed.

MATERIALS AND METHODS

Between January 2005 and July 2006, 83 shoulder arthroscopies were performed by one of the authors (JB). Among these, seven patients (8.4%) presented with post-traumatic labral tear with no primary dislocation or subluxation. This small series of patients helped us describe an uncommon pathology, chronic

¹Clinique des Cèdres, 21, rue Albert Londres, 38130 ECHIROLLES, France, ²Clinique du Mail, 43, avenue Marie Reynoard, 38100 Grenoble, ³Service de Traumatologie et Orthopédie, Hôpital Sud, BP 338 Av de Kimberley, 38434 ECHIROLLES CEDEX, France, ⁴Faculté de Médecine (UJF), Domaine de la Merci, 38700 LA TRONCHE, France

Correspondence:
Johannes Barth, M.D.
Clinique des Cèdres, 21,
rue Albert Londres, 38130 Echirolles,
France. E-mail: jrbarth@yahoo.fr

shoulder pain after trauma, and without clinical symptoms of instability. A complete clinical exam was addressed for each patient. Particular attention was paid to the detailed symptoms and radiological findings. Full range of motion was first verified to exclude capsulitis. Apprehension sign was assessed in abduction and external rotation for anterior and inferior instability, and in adduction and internal rotation for posterior instability. A positive sign was recognised if the patient felt the sensation of shoulder instability during this manoeuvre. Painful apprehension sign without sensation of instability was also recorded. SLAP tests were finally performed; these included O'Brien,^[1] Speed,^[2] O'Driscoll^[3] and Jobe relocation tests.^[4] Positive arthro-CT was defined by presence of a significant labral lesion well described by De Maeseneer *et al.*^[5] The labrum was analysed from a 3 to 9 o'clock position for anterior or posterior instability. Imaging signs indicating a damaged labrum included an absence or detachment of the labrum, or an irregular frayed appearance. On the glenoid side, a compressed fracture or separation fracture was considered as a bony lesion. Only type II, III and IV SLAP lesions were detected. The labrum was considered torn at a 12 o'clock position if the labral-bicipital complex was detached by a wide separation from the superior glenoid (type II), or by the presence of a bucket handle lesion (type III), or with an extension into the biceps tendon (type IV). Injected contrast enhanced these labral lesions. Macroscopic arthroscopic findings are presented. Palpation of the labrum and dynamic arthroscopy was performed to evaluate the peel back mechanism as described by Burkhart and Morgan.^[6] No conclusion was made concerning arthroscopic treatment because there was not enough follow-up, but the early results and concerns are reported.

RESULTS

The patient group included two female and five male patients. The mean age was 31 years (range, 23-38). The right shoulder was involved in five, and the left in two patients; the dominant side was involved in six patients. Direct trauma to the shoulder girdle occurred in four patients, one patient fell on his hand (indirect trauma) and two patients had received a heavy weight on their forearm with the palm up and elbow flexed to 90°. Four patients were given work compensation. None of the patients suffered from stiffness. The preoperative range of motion (active and passive) was symmetric: the forward elevation was 180° (for all patients), the mean external rotation elbow at the side was 69° (range, 45-90 degrees), and the internal rotation ranged from L3 to T10. Contusion of the shoulder was the primary diagnosis in 4 cases as no aetiology was suspected during the previous clinical examination or on the routine radiological investigation (radiographs). These patients presented with only an isolated painful shoulder.

Clinical examination revealed signs of impingement in two cases. Assessment of the rotator cuff was normal in all cases. Only one patient was found with a true apprehension sign, but all the patients presented with pain during this test. SLAP tear

signs were routinely screened for and we found five positive O'Brien, three positive Speed, four positive O'Driscoll, and five positive Jobe relocation tests.^[1-4] The mean preoperative Constant score was 74.4/100 (range, 59-81); the mean pain score was 3.9/15 (range, 1.5-6); the mean activity level score was 9/20 (range, 6-12); the mean mobility score was 39.6/40 (range, 38-40); the mean strength score was 22/25 (range 10-25). X-rays (AP view in neutral external and internal rotation, Y view and Bernageau view) revealed one calcific deposit on the supraspinatus tendon, and one anteroinferior bony fragment of the glenoid suggesting an initial undiagnosed subluxation. MRI scans were performed in four cases and did not contribute to the diagnosis. Arthro-CT scans were performed in all cases and revealed a labral tear. [Figure 1]. All patients had undergone physiotherapy and three patients had been given subacromial injections as well; none of these relieved the pain. After a primary conservative treatment for a mean 13.3 months (range, 8-22 months) shoulder arthroscopy was scheduled to diagnose the origin of the pain and eventually to treat the lesion at the same operative time.

The gleno-humeral investigation showed no rotator cuff tear, one isolated anterior Bankart (capsulolabral) lesion with a Hill Sachs lesion and a glenoid bony Bankart (capsulolabral + osseous detachment) lesion, two double lesions (anterior and posterior Bankart lesions), one triple lesion (anterior + posterior Bankart + type II SLAP lesion), and three isolated type II SLAP lesions. Arthroscopic repair was undertaken after diagnosing a labral lesion; 3mm Suture anchors (BioFASTak; Arthrex, Inc.; Naples, FL) were used. Capsular plication was also performed with Bankart repair. The arm was then immobilized in a sling for 1 month continuously and 2 more weeks discontinuously (only at night or during daily activities). Self-rehabilitation was started immediately post-operatively (pendulum and passive external rotation of the shoulder, flexion and extension of the elbow) rehabilitation with physiotherapists was started at 45 days after surgery.

Postoperative pain relief was significant for most of the patients.

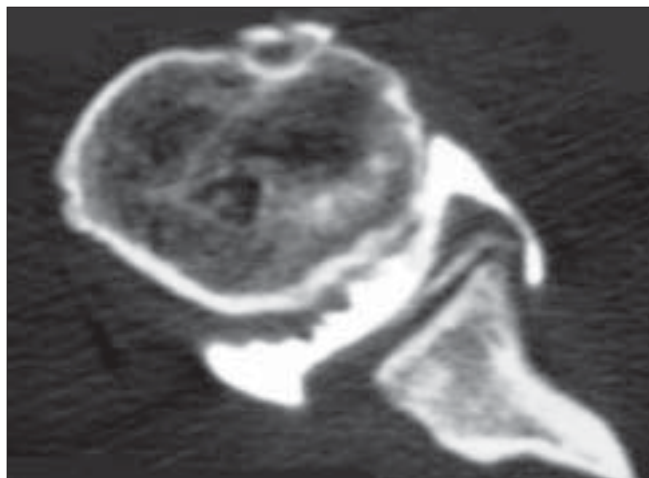


Figure 1: Arthro-CT scan. Transverse view showing injected contrast material extending into a tear of the anteroinferior labrum

All of them remained stiff for a long time and recovered a full range of motion only within four to seven months. Six months after surgery, the mean passive forward elevation was 168°, mean passive external rotation with arm at the side was 44°, and passive internal rotation ranged from L5 to T12.

DISCUSSION

The type of lesion may be related to the initial mechanism of trauma. Lesions depend on what position the upper limb was when the humeral head impacted the glenoid and/or the labrum. If the arm was elevated backwards with the elbow in extension (falling backwards), then an anterior Bankart could occur. A posterior Bankart lesion or a SLAP lesion could occur if the arm was elevated forward with elbow in extension (falling forward) or in case of a sudden deceleration, arm and elbow extended with a fixed hand (when driving a car). Catching a heavy weight on the forearm with the elbow flexed at 90° could lead to a SLAP lesion as well.

It is important to rule out common pathology before thinking of post-traumatic labral tears. This would include a stiff shoulder (all patients presented with a symmetric range of motion), an acromio-clavicular joint pathology (no painful AC joint), a malunion after an undiagnosed fracture (no fracture on X-rays or CT-scan), a rotator cuff tear (normal cuff testing and absence of tear on arthro-CT). Clinical examination is often inconclusive. As observed with the Constant score, pain and decreased activity level are the main disorders observed with this pathology (the mean pain score was 3.9/15 and the activity level score was 9/20). In this series, pain was the main symptom; this could have resulted in shoulder disability and severe amyotrophy in two patients who hardly used their upper limb. If these lesions were not obvious on X-rays (no Hill Sachs and no bony Bankart lesions) or on MRI, an arthro-CTscan could reveal the lesion in all cases. Computed tomographic and magnetic resonance arthrograms seem to be the best choice of imaging to analyse the labrum. Moreover, if the suspicion is high, even when the imaging is not clear, a diagnostic arthroscopy should be performed.

Walch and Molé described a type of anterior instability that presents only as a painful shoulder.^[7] Bankart (Bony Bankart or antero-inferior labral tear) and/or Hill-Sachs lesions observed on X-Rays, MRI-scan, Arthro-CT-scan, Arthro-MRI or arthroscopy, confirm the diagnosis. The apprehension sign is readily confusing. The authors called this type of instability “painful and unstable shoulder” and advised operative stabilization to relieve the pain. In our study, the apprehension sign was confusing (all of them were painful, only one true apprehension sign was recorded).

We observed no severe bone loss in our cases, which seemed logical since no real dislocation had occurred. Therefore, according to us, it is not necessary to initiate a bone grafting

procedure such as the Latarjet technique. These cases are well addressed arthroscopically with a Bankart procedure [Figure 2]. We were concerned with the postoperative (4 to 7 months) shoulder stiffness of our patients with this type of lesion when compared to Bankart repair for true dislocations. We think that capsular plication, which was systematically performed, is not necessary since soft tissue structures were not as distended as with a real dislocation.

Lafosse and Boileau showed that SLAP lesions related to labral lesions on the “upper hemisphere” of the shoulder; these correlated with an unstable painful shoulder.^[8] In contrast to these, “inferior hemisphere” lesions were more related to an unstable shoulder. We agree that upper labral tears (such as SLAP lesions) may not lead to instability because of the protecting coraco-acromial osteoligamentous arch; however, we were surprised to find a circumferential labral lesion in a painful



Figure 2: Arthroscopic anterior Bankart repair of a left shoulder (superior view)



Figure 3: Gleno-humeral arthroscopy of a right shoulder from a superior portal showing an anteroinferior Bankart lesion. Note cartilage damage and minimal capsular distension (the humeral head impacted the glenoid and the labrum but no dislocation occurred)

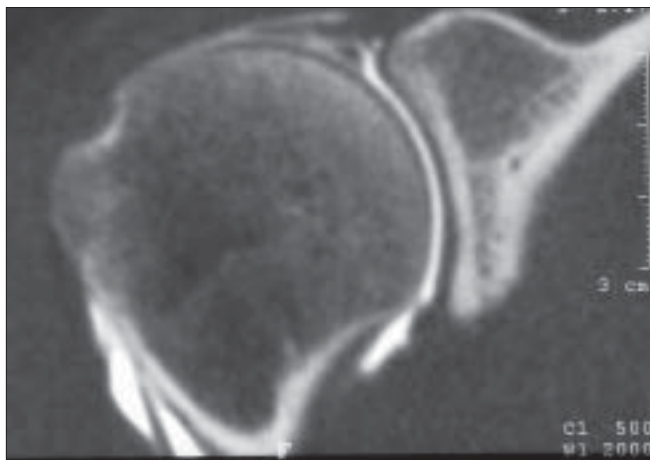


Figure 4: Arthro-CT scan. Coronal view showing a type II SLAP lesion



Figure 5: Gleno-humeral arthroscopy from a posterior portal showing a type II SLAP lesion previously diagnosed on Arthro-CT scan (Figure 3)

shoulder without any true dislocation. We believe that the location of the lesion is actually related to the mechanism of the injury (position in which the upper limb was when the humeral head impacted the glenoid and/or the labrum). Dislocation on the other hand occurs with an increase in energy of the related trauma (higher energy to create a real dislocation) due to an increase in the soft tissue distension [Figure 3].

Diagnosis of a SLAP lesion is more difficult since there is no specific clinical examination for the diagnosis.^[9] Athletes practicing overhead sports often complain of a dead arm syndrome well-described by Burkhart *et al.*^[10] We routinely use the O'Brien, Speed, Jobe relocation and O'Driscoll tests that are sensitive but not specific.^[1-4] Moreover imaging is not necessarily contributory since X-rays are normal, MRI can be normal and Arthro-CT scan may be misleading [Figure 4]. Therefore, the lesion is diagnosed during arthroscopy of the shoulder [Figure 5]. We fixed the labrum whenever we considered a type II SLAP lesion. All our patients who underwent SLAP repair

continued to have a stiff shoulder for several months after the surgery. Our early results are not spectacular clinically, although it is probably too early to consider final results. We assume that excessive tension on the superior labrum could probably account for the stiffness. However, if our results do not improve dramatically with a longer follow-up, we will be more cautious in the future when considering SLAP lesion repair.

Another important point is that a large number of our patients in this series received work compensation (4/7). We do not think that at that age (mean 31 years.), this could have an impact on the clinical outcome. Moreover, one might consider a reduced immobilization period to decrease postoperative stiffness.

CONCLUSION

The diagnosis of posttraumatic painful shoulder or chronic shoulder pain after contusion should be reconsidered after a reasonable period of unsuccessful physiotherapy (9 to 12 months) in young adults (in their thirties). Even if the clinical exam is inconclusive, and imaging is not contributory to detect the origin of pain, diagnostic arthroscopy should be performed to look for a labral tear (either a Bankart or a SLAP lesion). Direct or indirect trauma can lead to labral tears. Lesions depend on what position the upper limb was when the humeral head impacted the glenoid and/or the labrum. CT and magnetic resonance arthrograms of the shoulder should be considered to better diagnose labral lesions. If confirmed, the labral lesion can be fixed arthroscopically. Our lack of follow-up does not allow us to draw early conclusions. But we are concerned about the delay before recovering a full range of motion. Repair should be considered prudently, especially for work compensation, or for borderline lesions. Moreover, the usual duration of stiffness with this type of pathology could also be decreased by a shorter postoperative immobilization. Further studies with larger series and longer follow-up are needed to be more conclusive.

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