Arthroscopic repair for combined Bankart and superior labral anterior posterior lesions: a comparative study between primary and recurrent anterior dislocation in the shoulder

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Abstract

Purpose The purpose of this study was to compare clinical outcomes between a primary dislocation group (group P) and a recurrent dislocation group (group R) with combined lesion of Bankart and type II SLAP lesions (type V SLAP lesion) and to evaluate incidence of type V SLAP lesion. In addition, the authors evaluated clinical outcomes of these patients by dividing two groups according to the sequence for Bankart and SLAP lesion suture.

Methods From May 2000 to May 2005, 310 patients who gave informed consent, underwent the diagnostic arthroscopy and magnetic resonance arthrography (MRA). One hundred and ten patients met the following criteria: (1) post-traumatic primary or recurrent anterior shoulder instability, (2) a normal contralateral shoulder, (3) a type V SLAP lesion, and (4) minimum follow-up of two years. Group P included 42 patients, and group R, 68 patients. Among all patients, 58 patients who had Bankart lesions sutured first were included in group B, and 52 who had their SLAP lesions sutured beforehand, group S. Visual analogue scale, range of motion, Rowe and Constant score were used to compare results between group P and group R, also group B and group S.

Results The incidence rates of type V SLAP lesion were 42.8% in group P and 32.0% in group R. The overall treatment results in our study were good. Even if the difference between the two groups was statistically insignificant, group P showed greater recovery of range of motion than group R in external rotation. No significant difference was found between the two different operative methods according to suture sequence.

Conclusion The incidence rates of type V SLAP lesion were 42.8% in the primary dislocation group and 32.0% in the recurrent dislocation group. The overall treatment results in our study were good. Although there was no statistical significance in surgical time between the two groups, when both SLAP and Bankart lesions are present, the Bankart lesion must be sutured first to reduce surgical time.

Introduction

Andrews et al. [1] described an injury of the superior labrum in 1985, and Snyder et al. [2] classified the injury into four types and named this lesion ‘SLAP’ (superior labral anterior to posterior). The type I lesion is characterised by fraying but with no frank tear of the articulating surface of the superior portion of the glenoid labrum and with an intact biceps tendon. The type II lesion consists of superior labral fraying with stripping of the superior part of the labrum and attached biceps tendon from the underlying glenoid cartilage. The type III lesion is a bucket-handle tear of the superior portion of the labrum with the central portion of the tear often displaced into the joint and the peripheral portion firmly attached to the glenoid cartilage. The biceps tendon and labral-biceps anchor extension were not involved. The type IV lesion consists of a bucket-handle tear of the superior portion of the labrum similar to the type III lesion, but with the tear extending into the biceps tendon. Maffet et al. [3] added three more types (V-VII) to Snyder’s classification. According to Maffet’s classification, the type V SLAP lesion is a Bankart lesion that continues superiorly and includes separation of the biceps complex (a combination of Bankart and type II SLAP lesions) (Fig. 1), and type VI is an anterior or posterior flap tear in conjunction with separation of the

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Fig. 1 MRA images of a typical type V SLAP (superior labral anterior to posterior) lesion of a 25-year-old patient with primary dislocation. A SLAP lesion in the coronal section (a); a Bankart lesion in the axial section (b) and sagittal section (c)

biceps tendon superiorly. Type VII involves the biceps tendon–superior labrum separation extending anteriorly to include the middle glenohumeral ligament. A combined lesion of the labral injury as seen in a type V SLAP lesion is not rare, especially when severity and extension of the labral lesion continues to extend as time passes and frequency of dislocation increases [4]. When the type II SLAP lesion is combined with the Bankart lesion in a patient with recurrent dislocations, which increases the frequency of shoulder instability, surgical repair to stabilise the shoulder joint is required [5–7].

Recently, there has been some debate as to what should be provided as an initial treatment plan of the primary shoulder dislocation. Seybold et al. [8] reported that, on MRI, Perthes lesions were reduced adequately by externally rotating the arm, but extensive lesions involving the biceps anchor did not properly resolve by conservative treatment in patients with first-time dislocations. However, studies focussing on incidences and clinical outcomes of type V SLAP lesions developed in first time shoulder dislocation patients have been uncommon, and there are also fewer comparative studies about surgical outcomes between first-time dislocation and recurrent dislocation.

The purpose of our study was to compare clinical outcomes between a primary dislocation group and a recurrent dislocation group with combined lesions of Bankart and type II SLAP (type V SLAP lesion) and to evaluate incidence of type V SLAP lesion. In addition, the authors evaluated clinical outcomes of these patients by dividing into two groups according to suture sequence for Bankart and SLAP lesion.

Materials and methods

This study was approved by our institute's ethical review board and informed consent was obtained from all patients.

Study subjects

All patients with traumatic anterior shoulder dislocation were recommended for magnetic resonance arthrography (MRA) and diagnostic arthroscopy of the shoulder joint. From May 2000 to May 2005, a total of 365 patients were admitted, and, among them, 310, who gave informed consent, underwent the diagnostic arthroscopy and MRA. Of 310 patients, 98 had acute dislocation, and 212 were admitted for recurrence of the dislocation. Those who satisfied the following criteria were chosen to participate in the study: (1) post-traumatic primary or recurrent anterior shoulder instability, (2) a normal contralateral shoulder, (3) a combination of a Bankart lesion and a type II SLAP lesion (type V SLAP lesion), and (4) minimum follow-up of two years. A combined Bankart lesion and type II SLAP lesion was defined as a continuous labral lesion from the 10-o'clock to 6-o'clock position (for a right shoulder).

Patient selection was based on having no previous history of anterior dislocation or other shoulder joint symptoms prior to the dislocation. Dislocation was defined as displacement of the humeral head into a locked position anterior to the glenoid, necessitating manual reduction. After the trauma, initial X-ray confirmed the dislocation. The presence of the dislocation was verified radiographically in all patients. For the recurrent dislocation group, X-ray was used at least twice to confirm the dislocation. Patients with lesions of the posterior glenoid labrum, bony Bankart lesions or anterior glenoid defects more than 25%, generalised ligamentous laxity and humeral avulsion of the glenohumeral ligament (HAGL) were excluded from the study.

For the study, 110 consecutive shoulders in 310 patients who met the inclusion criteria were eligible. From these patients, two groups were formed. Group P was the primary dislocation group including 42 patients, and group R was the recurrent dislocation group of 68 patients. We defined the primary dislocation group as one-time traumatic

anterior dislocation, and the recurrent dislocation group as two or more episodes of traumatic anterior dislocation of the shoulder joint. In addition, 58 patients who had Bankart lesions sutured first were included in group B (Fig. 2), and group S had 52 patients who had their SLAP lesions sutured beforehand (Fig. 3). Comparison of the data showed that the P and R groups were well matched for age, sex, dominance, occupation and cause for the first dislocation (Table 1). Among the 14 cases of athletes in group P, ten (23.8%) were collision athletes. In group R, 15 (22.0%) were collision athletes. Level of sports activities in patients were divided into three groups of recreational, competitive contact, and no activity. In group P, 23 patients participated in recreational sports (54.7%), 11 in competitive contact sports (26.1%), and eight in no activity (19.0 %). In group R, 38 patients were involved in recreational sports (55.8%), 16 in competitive contact sports (23.5%), and 14 in no activity (20.5%). In group R, a number of repetitive dislocations reported by patients was on average 11.4 (range, 2–30); two to five times was reported in 22 cases (32.3%), six to ten times in 18 cases (26.4%), 11 to 20 times in 17 cases (25.0%), and more than 20 times in 11 cases (16.1%). Preoperative apprehension test and relocation test results were positive in all patients.

Surgical methods and physical therapy

Arthroscopic surgery was performed by one shoulder specialist (K.D.S.), two residents, and a professional nurse. Instability of the shoulder was evaluated under general anaesthesia (EUA). Grade 1 was designated to those whose humeral head was incompletely dislocated from the glenoid rim. If there was dislocation from the glenoid rim but the dislocation could be reduced spontaneously, then it was defined as grade 2. If the dislocation could not be reduced spontaneously, then it was considered as grade 3 [9, 10]. Patients were placed in a lateral decubitus position by inclining their trunks back posteriorly at 30 degrees, arms flexed at 20 degrees and abducted at a 45 degree angle. Traction of 3–4 kg in weight was used. Initially, the arthroscope was placed through the posterior portal, and the anterosuperior and anteroinferior portals were created when necessary. Then, following observation through the posterior portal, accompanying lesions were examined through the anteroinferior and then the anterosuperior portal. In particular, shape of the glenoid and range of abnormal glenoidal labrum lesion were studied through the anterosuperior portal. At the time of diagnostic arthroscopy, all the findings were recorded prospectively using a special

Fig. 2 Arthroscopic view of combined Bankart and superior labral anterior posterior lesions (SLAP) in the patient of group B (*top row*). The Bankart lesion was repaired first then the SLAP lesion was repaired (*bottom row*)

Fig. 3 Arthroscopic view of combined Bankart and superior labral anterior posterior lesions (SLAP) in the patient of group S (*top row*). The SLAP lesion was repaired first then the Bankart lesion was repaired (*bottom row*)

evaluation form. Following the operation, the findings were recorded and sorted into five lists including anteroinferior labral lesion, capsular lesion, SLAP lesion, bony structure, and rotator cuff lesion.

A 3.0-mm Bio-SutureTak (Arthrex) absorbable was used to suture labral lesions. Suture passage was accomplished using a Concept Shuttle Relay system (Conmed Linvatec, Largo, Florida). Separated labrum

Table 1 Patient demographics

Variable	Group P	Group R	<i>P</i> value
Number of patients	42	68	
Mean age, y (range)	24.2 (17–34)	27.8 (18–38)	0.844
Male	37	60	0.362
Female	5	8	0.262
Dominant arm	28	40	
Mean number of episodes of dislocation (range)	1	11.4 (2–30)	<0.001
Mean age at the first dislocation, y (range)	23.5 (17–33)	22.6 (15–33)	0.445
Mean time from first dislocation to surgery	14.2 (2–32) days	25.3 (10–28) months	0.018
Occupation			
Soldier	20	35	0.438
Athletes	14	20	0.567
Worker	6	10	0.754
Housewife	2	3	0.338
Cause of first dislocation			
Military training	11	22	0.556
Football	12	19	0.331
Basketball	9	14	0.248
Falls	6	8	0.345
Bicycle accident	4	5	0.253

was accordingly placed in order to be restored to its original anatomical location. When both SLAP and Bankart lesion were present, the order of which lesion was sutured first was random.

After the operation, an abduction orthosis was worn by the patients. Isometric and passive anterior flexion exercises were started on the first postoperative day. Patients started progressive extension exercise after two weeks. At week three, assisted active exercises were initiated, and at week four, the orthosis was removed to begin full range motion exercises of the joint. Therabands and dumbbells were used to strengthen the muscle six weeks after the operation. Resistant muscle reinforcing exercises were initiated at week 12. Return to regular sports activity started six months after the surgery.

Evaluation methods

A radiologist specialising in the musculoskeletal system provided interpretations of the MRA results. Arthroscopic findings were unknown to the radiologist during the reading. To investigate the connection between preoperative MRA and postoperative arthroscopic diagnosis, accuracy and sensitivity to find lesions such as labrum and SLAP lesions were calculated using intraoperative arthroscopic findings as a standard.

All examinations were made both pre- and postoperatively. A visual analogue scale (VAS) was used to assess subjective pain symptoms of the patients. Range of motion, including elevation and external rotation, was also assessed. For clinical evaluation, the Rowe and Constant score were used, and the results of group P and group R were compared and analysed. In addition, the results of group B and group S were compared.

Recurrence or failure was defined as a redislocation or subluxation episode. Instability tests (apprehension sign and relocation test) and all clinical assessments were performed by two orthopaedic specialists who were not aware of the details of the patients.

All statistical analysis was done by SPSS statistical software (SPSS Inc., Chicago, IL) for Windows (Microsoft Corp, Redmond, WA) with a 95% confidence level. We used unpaired t-test for comparison between the two groups. The level of significance was *p* value less than 0.05.

This study was accomplished without external funding.

Results

Incidence of the type V SLAP lesion was 42.8% (42 of 98) in group P and 32.0% (68 of 212) in group R. In total population of type V SLAP lesion, Constant score and Rowe score were improved at last follow-up when

compared to preoperative scores. Postoperative VAS score was also excellent. All other variables in the total population were presented in Tables 2 and 3.

Clinical results

VAS score in group P significantly improved from a mean preoperative score of 5.1 to mean score of 0.6 at the last follow-up ($p<0.01$), and the score in group R also significantly improved from preoperative 5.6 to 0.7 at the last follow-up ($p<0.01$). However, there was no statistically significant difference between the two groups. For range of motion, external rotational angles in 90° abduction position in groups P and R showed 18 and 10 degrees increment, respectively ($p=0.180$) (Table 2). There was no significant difference between the two groups in terms of shoulder pain.

The mean Constant scores in group P improved significantly from a preoperative mean of 55 points to 94 points at the last follow-up ($p<0.01$), and the score in group R increased significantly from preoperative 53 to 88 at the last follow-up ($p<0.01$). The Rowe scores in both groups P and R also had significant improvement (Table 3). The score in group P increased from a preoperative score of 34 to 91 at the final follow-up ($p<0.01$), and in group R, the score was raised from 31 before the surgery to 88 at the last follow-up ($p<0.01$). At the last follow-up, however, the Constant score and Rowe score did not show any statistical differences between the two groups (Table 3).

Between group B and group S, which are divided according to the order of suture sequence, the Constant scores were compared. The mean Constant scores in both groups improved from 53 to 92 points in group B and from 54 to 89 points in group S. The mean Rowe scores between the two groups were also compared. At the last follow-up evaluation, group B scored 90 points (28 excellent, 16 good, and 2 fair), and group S recorded 89 points (24 excellent, 15 good, one poor). However, Constant and Rowe scores did not have any statistical difference between the two groups ($p>0.05$) (Table 3). No significant difference was found between these two groups in the range of motion either ($p>0.05$) (Table 2). Average procedure times in group B and group S were 81 minutes (range, 63–100) and 92 minutes (range, 68–125) ($p=0.064$).

There was no difference between the two groups regarding the failure rate. Group P had one case (2.3%) of failed result, and group R had two cases of failed results (2.9%). Both had positive instability tests and experienced recurrent dislocations. Revision operation was performed in two patients, and one refused the suggestion of further surgery. Two patients from group P and three patients from group R had positive instability test results at the last follow-up evaluation. Postoperative infection or displacement of the screw was not observed.

Table 2 Range of motion values preoperatively and postoperatively

	Pre-op/post-op	Total	Group P	Group R	<i>P</i> value ^a	Group B	Group S	<i>P</i> value ^b
<i>pre-op</i> preoperative, <i>post-op</i> postoperative	Elevation	167/173	171/175	166/172	0.543	169/175	166/172	0.688
	External rotation							
	Arm by side	67/71	68/73	66/69	0.344	67/71	66/70	0.814
	90° abduction	70/83	72/90	68/78	0.180	70/85	70/84	0.778
	Internal rotation	T8/T9	T8/T8	T8/T10	0.214	T8/T9	T8/T9	0.762
	Abduction	145/159	149/161	143/158	0.456	146/159	144/158	0.713

^a *p* value between groups P and R^b *p* value between groups B and S

Finally, all the patients in both groups returned to their work, while 94.1% (32 of 34) of the patients from group P and 88.4% of the patients from group R (46 of 52) returned to their preinjury sports activities after the surgery.

Surgical findings

Table 4 summarises the results of EUA and arthroscopic findings in each group. Haemarthrosis was evident in all patients with primary dislocation (group P) and in three patients with recurrent dislocation (group R) who underwent operation soon after a recent dislocation. Both groups revealed grade 2+ or 3+ anterior translation. A Hill-Sachs lesion on standard radiographs was found in 31 cases in group P (73.8%) and in 66 cases in group R (97.0%) (*p*=0.015). A slight debridement was performed when a partial rotator cuff tear was present.

Surgical correlation

Preoperative MRA in group P did not reveal a Hill-Sachs lesion in one patient and a partial rotator cuff tear lesion in

one patient. Two additional lesions were detected on arthroscopy, but missed by MRA in group R. These were a loose body lesion and a Hill-Sachs lesion (Table 4). However, with the exception of these four cases, surgical findings in all patients coincided with MRA findings (96.3%).

Discussion

Early treatment on primary shoulder dislocation is under much discussion recently. Itoi et al. [11] first raised the possibility of improving non-operative treatment after shoulder dislocation by placing the arm in external rotation. However, there have been many criticisms about conservative treatment. Comparisons between conservative and surgical treatment of primary dislocation have often been reported, but reports about the surgical indications for patients with primary shoulder dislocation have been rare. Seybold et al. [8] recently reported a study on the effect of external rotation in relation to different types of labroligamentous lesions in patients with first-time traumatic anterior

Table 3 Rowe scores and Constant scores

Variable	Total	Group P	Group R	<i>P</i> value ^a	Group B	Group S	<i>P</i> value ^b
Follow-up time, mo	45.1 (25–118)	46.4 (25–88)	44.6 (28–118)	0.442			
Constant scores							
Preoperative	54 (44–69)	55 (45–66)	53 (44–69)	0.843	53 (46–66)	54 (44–69)	0.874
Postoperative	90 (58–100)	94 (62–100)	88 (58–100)	0.486	92 (58–100)	89 (56–100)	0.544
Rowe scores							
Preoperative	32 (20–46)	34 (24–46)	31 (20–44)	0.812	30 (20–46)	32 (22–46)	0.834
Postoperative	89 (52–98)	91 (63–97)	88 (52–98)	0.386	90 (52–98)	89 (54–98)	0.522
VAS postoperative score	0.6 (0–4)	0.6 (0–4)	0.7 (0–4)	0.534	0.5 (0–4)	0.7 (0–4)	0.578
Return to work	106/110 (96.3%)	40/42 (95.2%)	66/68 (97.0%)	0.835			
Return to sports	78/86 (90.6%)	32/34 (94.1%)	46/52 (88.4%)	0.658			
Recurrences	3	1	2	0.435	2	1	0.478
Positive apprehension test	5	2	3	0.248	3	2	0.321

VAS visual analog scale

Ranges in parentheses unless otherwise specified

^a *p* value between groups P and R^b *p* value between groups B and S

Table 4 MRA findings and arthroscopic findings

Variable	MRA findings		Arthroscopic findings		<i>P</i> value ^a
	Group P	Group R	Group P	Group R	
Number of patients	42	68	42	68	
Hemarthrosis			42 (100%)	3 (4.4%)	<0.001
Anterior translation					
Grade 2	14 (33.3%)	21 (30.8%)	14 (33.3%)	21 (30.8%)	0.543
Grade 3	28 (66.6%)	47 (69.1%)	28 (66.6%)	47 (69.1%)	0.421
Bankart lesion	42 (100%)	54 (79.0%)	42 (100%)	54 (79.0%)	0.015
ALPSA lesion	0	14 (20.5%)	0	14 (20.5%)	0.045
Hill-Sachs lesion	30 (71.4%) ^b	65 (95.5%) ^b	31 (73.8%)	66 (97.0%)	0.015
Capsular laxity	3 (7.1%)	8 (11.7%)	3 (7.1%)	8 (11.7%)	0.267
Partial rotator cuff tears	2 (4.7%) ^b	4 (5.8%)	3 (7.1%)	4 (5.8%)	0.845
Loose bodies	5 (11.9%)	6 (8.8%) ^b	5 (11.9%)	7 (10.2%)	0.914

^a *P* value between groups P and R in arthroscopic findings

^b One case of each variable was missed in MRA interpretation by specialized radiologist

shoulder dislocation. In the study, Perthes lesions that showed a low grade of plastic deformation displayed better reduction in external rotation than Bankart lesions. Therefore, conservative management is a more suitable method treating the Perthes lesion. On the other hand, patients with a high grade of plastic deformation, HAGL lesions, and midsubstance complete capsular tears, tears of the subscapularis tendon or lesions that involve the biceps anchor are, to our belief, not suitable for the external rotation position alone, and they should be considered for surgical stabilisation instead. We paid particular attention to type V SLAP lesions among various sequelae of acute dislocation. This is an extensive lesion that involves the biceps anchor leading to a poor outcome when treated conservatively such as by external rotation. In a previous study, diverse results of conservative treatment on acute dislocation have been published. We believe the reason for the diversity of the outcomes is that, in the past authors neglected the fact that a variety of labral lesions exist. This led to a failure to report the outcome of conservative treatment based on the types of lesions. Thus, among labral lesions occurring with shoulder dislocation, we found that in type V SLAP lesions, reduction by conservative management seems ineffective. Antonio et al. [12] reported that the incidence rates of superior extension lesion in the first-time dislocation group were 39% for those younger than 30 years old and 20% in those older than or equal to 30 years old. They defined the significant superior extension lesion to be extended above the 3 o'clock position. It is unclear whether superior extension lesion indicates type V SLAP. In our study, the primary dislocation group had incidence of type V SLAP of 42.8%, which was a higher rate than that of Antonio et al. Also, our results showed fewer incidences in group R than group P, and this outcome was contrary to other studies [4, 13]. If the same conservative treatment was performed in all cases without investigation of the types of capsulolabral lesions of the

primary dislocation the success rate could be expected to be poor and be followed by recurrent dislocation. The possibility of spontaneous healing of SLAP lesions over time is less likely in type 5 lesions in the recurrent group.

Recovery to preoperative normal range of motion is essential for postoperative function of the shoulder joint. McGlynn et al. [14] reported that excessive tightening of the anterior capsule during an operation may result in the loss of external rotation, later developing into arthritis. In contrast to previous studies, when abducted to 90 degrees, postoperative external rotation in both groups had improved significantly from preoperative results in our study. Reattachment of the anterior labrum to the glenoid to create a "bumper" effect, repair of the superior labrum, and reduction of capsular volume are critical parameters for a successful result. The authors also advocate full release of the capsulolabral complex from the anterior glenoid neck to better mobilise the capsule and facilitate shifting the capsule to eliminate capsular stretch injury. In the recurrent dislocation group, 41.1% were found to have had ten or more dislocations, and patients in the group required much more capsular release and shifting than the primary dislocation group. During this process, it is thought that some postoperative loss of external rotation had been incurred. Between the two groups, there was 8° average gap in range of motion during 90° external rotation despite no significant statistical difference. Also, the recurrent group had lower frequency of returning to previous level of sports activities than the primary group. This may be affected by limitation of range of motion of the joint.

There has been considerable research comparing clinical results between primary and recurrent dislocation groups. However, our study is the first that compared two groups focussing on type V SLAP lesion only. In our study, both groups improved significantly in Constant score, Rowe score, and VAS scores, and did not show statistical differences between two groups. Gartsman et al. [15] also reported no

association between recurrence rate and number of preoperative dislocations. Nor did our study find a difference in failure rate between the two groups. The overall failure rates in groups P and R were 2.3% and 2.9%, respectively. Furthermore, five patients (two from group P and three from group R) had positive instability test findings. This corresponds to recent studies with low recurrence after arthroscopic repair for anterior instability.

The recurrent group patients, when compared to the primary group, with type V SLAP lesion did not show statistical difference on Constant score and Rowe score, but, at the final follow-up, the primary group produced in higher scores and had relatively less limitation of external rotation. Returning to previous sports activities was also more prevalent in the primary group. If conservative treatment cannot guarantee better results in treating type V SLAP lesion, an extension lesion, it is considered more beneficial to recommend patients and their family to choose early arthroscopic stabilisation over conservative management for the type V SLAP lesion accompanying acute dislocation.

The surgeon must be prepared to devote additional time and effort in cases of type V SLAP lesion. In our study, clinical results and operative time according to the order of suture sequence were compared between the two groups. No significant differences were found in clinical outcomes, range of joint motion or surgical time. Even though there was no statistical difference in surgical time, the group (group S) which sutured SLAP before suturing the Bankart lesion had significantly longer average surgical time than the other group (group B). Lo et al. [16] stated that if SLAP repair is performed first, visualisation becomes limited, making anterior labrum repair more difficult. Burkhart et al. [17–19] noted that ‘pseudolaxity’ provided by the SLAP lesion will improve the visualisation and working space during anterior and posterior labral repair. We also found that, when repairing SLAP prior to fixing Bankart lesion, the pseudolaxity disappeared, making the Bankart lesion repair more difficult. We think that this led to extension of surgical time.

We attempted to identify the incidence of type V SLAP lesion and prevalence of the accompanying lesions by comparing the findings of MRA taken before operation to the findings at arthroscopy. In our study, except for four cases that were missed by MRA, surgical findings in all lesions coincided with MRA findings (96.3%). Thus, we believe that MRA is an accurate method for assessing the accompanying lesions.

Several limitations exist in this study. First, the study was composed of a relatively small number of subjects, and, in particular, the number of subjects suffering acute dislocation was small. Second, patients usually have varying sports activities prior to injury. Thus, application

of our results to all patients with anterior shoulder dislocation is impractical. Lastly, histological and pathophysiological studies of tissue damage during the interval period from trauma to surgery were not performed.

Conclusion

The incidence of type V SLAP lesion was 42.8% in the primary dislocation group and 32.0% in the recurrent dislocation group. The overall treatment results in our study were good. Even if the difference between the two groups was statistically insignificant, the primary dislocation group with type V SLAP lesion showed greater loss of range of motion than the recurrent dislocation group in external rotation. The two groups gained similar results in other clinical assessments. In addition, no significant difference was found between the two different operative methods according to suture sequence. Although there was no statistical significance in surgical time between the two groups, when both SLAP and Bankart lesions are present the Bankart lesion must be sutured first to reduce surgical time.

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