

Incidence of Re-Dislocation/Instability After Arthroscopic Bankart Repair: Analysis via Telephone Interviews

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Summary: Introduction: Current advances in arthroscopic surgery have led to good outcomes for arthroscopic Bankart repair (ABR) for recurrent anterior shoulder dislocation. However, recent studies have reported recurrence rates of 4%-19% after ABR. In our survey conducted from February 2002 to December 2010, the post-ABR re-dislocation rate was 8.8%. In 2011, we began performing the ABR with open Bristow (B) procedure or Remplissage (R) procedure in patients with large glenoid or humeral head bone defects and in patients who play collision sports. Therefore, the present study is the second series evaluating the incidence of re-dislocation and instability after recurrent anterior shoulder dislocation.

Method: Surgery was performed for 84 cases of shoulder instability from January 2011 to August 2017. After excluding 7 open surgeries, 6 reoperations, and 2 patients with multidirectional instability, telephone interviews were conducted with 69 patients. The average follow-up duration was 46.9 months (range, 13-92 months).

Result: ABR alone was performed 61 patients; the B procedure was added for 3 patients, and the R procedure was added for 5 patients. Telephone interviews were conducted with 61 patients. There were no cases of re-dislocation or reoperation. Four patients who underwent only ABR experienced postoperative instability, but not to the extent that their daily lives were affected.

Conclusion: This study showed that the addition of R or B technique to ABR for recurrent anterior shoulder dislocation resulted in a 0% re-dislocation rate.

Keywords re-dislocation, arthroscopy, bankart repair, remplissage, bristow procedure, shoulder

INTRODUCTION

Shoulder dislocation is the most common form of joint dislocation, accounting for approximately 50% of all dislocations. Approximately 95% of the dislocations are anterior dislocations, with re-dislocation occurring in 90% of the patients aged ≤ 20 years old, 80% of the patients in their 20s, and 50% of the patients in their 30s [1,2].

The primary cause of recurrent anterior shoulder

dislocation is rupture of the anterior shoulder support structure at the time of dislocation, such as detachment of the antero-inferior glenohumeral ligament (AIGHL)-labral-complex from the edge of the glenoid (Bankart lesion). When patients have recurrent dislocations, conservative therapy of the AIGHL-labral-complex cannot be expected to be effective, and surgery is indicated when the injury hinders daily activities or participation in sports. Bankart repair is an anatomic procedure to repair the Bankart lesions,

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Abbreviations: ABR, arthroscopic Bankart repair; AIGHL, antero-inferior glenohumeral ligament; A/S, arthroscopic; B, Bristow; R, Remplissage; SLAP, Superior Labrum Anterior and Posterior.

and stable outcomes are achieved. Recent advances in arthroscopic surgery have led to good outcomes for arthroscopic Bankart repair (ABR) for recurrent anterior shoulder dislocation [3].

However, recent studies have reported recurrence rates of 4%-19% after ABR [4-7]. Several factors are associated with recurrent instability, including age and sex, bilateral shoulder instability, generalized joint hyperlaxity, physical activity, time interval between the first dislocation and surgery, participation in collision sports, early return to contact sports, size of the humeral defect (Hill-Sachs lesion), concomitant labral lesion, and glenoid bone defects or version. We conducted a survey from February 2002 to December 2010 and found that the post-ABR re-dislocation rate was 8.8%, with a large Hill-Sachs lesion (>250 mm³), glenoid bone defect (>20%), and less than four suture anchors, being risk factors for post-ABR re-disloca-

tion [8].

Based on these results, from 2011 onwards, we began performing the ABR with open Bristow (B) procedure or the Remplissage (R) procedure in patients with large glenoid or humeral head bone defects and in patients who play collision sports. Therefore, this study is a second version wherein we examined the incidence of re-dislocation or instability after recurrent anterior shoulder dislocation through telephone interviews.

METHODS

The study was approved by the institutional review board approval of the Kurume University Ethics Committee (#19065).

TABLE 1.
Patient demographic data

	Range	Mean±SD	Number (n)	Percentage (%)
Age (y)	15-68	28.3±19.6		
Gender				
Male			54	78
Female			15	22
Injured side				
Right			35	51
Left			34	49
Type of sport				
No sport			22	32
Collision/Contact			31	45
Overhead			16	23
Waiting time to surgery (months)				
≥ 6			58	84
< 6			11	16
Number of re-dislocations prior to surgery				
≥ 5			42	61
< 5			27	39
SLAP lesion				
Yes			13	19
No			56	81
Tear of capsular				
Yes			10	14
No			59	86

Subjects

Surgery was performed for 84 cases of shoulder instability from January 2011 to August 2017. After excluding 7 open surgeries, 6 reoperations, and 2 patients with multidirectional instability, telephone interviews were conducted with 69 patients (54 men, 15 women). The patients' average age at the time of surgery was 28.3 years (range, 15-84 years). The average follow-up period was 46.9 months (range, 13-92 months). The details are shown in Table 1.

Surgical Technique

Arthroscopic Bankart repair

The surgery was performed according to our previous report [8]. After mobilization of the capsule-ligament complex from the glenoid neck, the anchors were placed and the capsulolabrum was shifted superiorly. A total of 4-8 anchors were placed for the surgical repair.

Bristow (B) procedure

The criteria for adding the B procedure were as follows: 1) area of glenoid bone defect >20% [9,10] and 2) playing collision sports [11,12]. An anterior portal is used to create a vertical incision about 8 cm long in the anterior shoulder. First, a dissection is made 1.5 cm from the tip of the coracoid process and cortical/cancellous screws are inserted using a guide wire. Next, the subscapularis tendon is split in half along its fibers, the joint capsule is opened, and the cortical bone is exposed at a position that matches the anteroinferior scapular neck (right shoulder: 4 o'clock). Then, a chisel is used to expose the cancellous bone. Finally, the guide wire is passed through to the posterior neck and fixed with screws.

Remplissage (R) procedure

The R procedure was performed in addition to ABR in all patients with the Hill-Sachs lesions and when the extent of the humeral bone defect was "off track" [13,14]. The arthroscope was inserted into the joint from an anterior portal; the anchors (1-2, depending on the size of the Hill-Sachs lesion) were then inserted into the Hill-Sachs lesion from a posterior portal. Using bursoscopy, a thread was passed through both the infraspinatus tendon and joint capsule to attach them to the bone defect using mattress sutures.

Outcome measures

As in our previous study (1st series) [8], a letter regarding the telephone interviews was sent; following this, the patients were called, and the interview

was conducted. After verbal consent was confirmed, the patients were queried on their current status (i.e., incidence of re-dislocation and/or apprehension after surgery).

RESULTS

ABR alone was used in 61 patients, the B procedure was added for 3 patients, and the R procedure was added for 5 patients. Telephone interviews were conducted with 61 patients (ABR procedure: 53 patients, B procedure: 3 patients, R procedure: 5 patients; 88% follow-up rate). There were no cases of re-dislocation or reoperation (0% re-dislocation rate). Postoperative shoulder instability was felt by 4 patients who underwent ABR only, but not to an extent that hindered their daily lives (6% postoperative instability rate).

DISCUSSION

Most studies on the clinical outcomes of ABR have reported that re-dislocation is a particularly challenging postoperative complication, with re-dislocation rates of 4%-19% [4-7]. Lee et al. reported a re-dislocation rate of 18.8% after ABR, with a period of ≥ 6 months between the first dislocation and surgery, ≥ 2 dislocations prior to surgery, and "off-track" Hill-Sachs lesions being risk factors for re-dislocation [15].

In our first series (2002-2010) [8], the re-dislocation rate was 8.8%. In that series, only ABR was performed for all patients. Large Hill-Sachs lesions and using <4 anchors were risk factors for re-dislocation. In this second series, at least 4 anchors were used with ABR in principle (3 with the B procedure), the R procedure was added for patients with large Hill-Sachs lesions, and the B procedure was added for patients with large glenoid bone defects or who played collision sports. Consequently, we successfully achieved a 0% re-dislocation rate after surgery.

When the B procedure is added to ABR, the conjoint tendon acts as a muscle guard for the anteroinferior shoulder, and the transferred coracoid process serves as a bone block, which creates a superior damping effect that reportedly reduces re-dislocation rates [9,10]. Ozeki et al. used an open Bristow procedure to treat recurrent shoulder dislocation in patients who played collision sports. In their report, all patients were able to return to competition and none experienced re-dislocation [16]. Suzuki et al. reported that all patients returned to competition and none experienced re-dislocation with the arthroscopic Bankart

and Bristow procedure [17]. In the present study, use of the arthroscopically-assisted Bristow procedure obtained positive outcomes even in cases with large glenoid defects and patients who played collision sports.

Large Hill-Sachs lesions that fit the glenoid are called engaging Hill-Sachs lesions and are a risk factor for re-dislocation [18]. In the R procedure, the Hill-Sachs lesion is sutured to the posterior joint capsule and infraspinatus tendon to prevent anterior deviation during both passive and active motion. Wolf et al. performed the R procedure during ABR in patients with Hill-Sachs lesions of moderate or higher severity [18,19]. They reported that 90% of the patients returned to participate in competitions, and the re-dislocation rate was 7.5%. Wolf et al. reported a 4.4% re-dislocation rate in a population that included patients who played collision sports. In the present study, we obtained good outcomes performing the R procedure during ABR in patients with large Hill-Sachs lesions, and performing the B procedure during ABR in higher risk collision sports athletes.

LIMITATIONS

A limitation of this study was that it was a retrospective study with the possibility for recall bias; however, we examined the re-dislocation rate after ABR in most patients, with a mean follow-up of approximately 4 years (range, 1-8 years).

CONCLUSION

In this study, performing ABR for recurrent anterior shoulder dislocation and performing the R or B procedure during ABR, depending on the patient, yielded a 0% re-dislocation rate.

CONFLICT OF INTEREST: All authors have no conflict of interest with respect to this study.

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