Revision Arthroscopic Labral Repair Using All-Suture Anchors in Patients With Subcritical Glenoid Bone Loss After Failed Bankart Repair

Clinical Outcomes at 2-Year Follow-up

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Background: All-suture anchors have been used for primary arthroscopic Bankart repair because of their ability to minimize initial bone loss.

Purpose: To evaluate the clinical efficacy of using all-suture anchors in revision arthroscopic labral repair after failed Bankart repair.

Study Design: Case series; Level of evidence, 4.

Methods: Enrolled in this study were 28 patients who underwent revision arthroscopic labral repair with all-suture anchors after a failed primary arthroscopic Bankart repair. Revision surgery was determined for patients who had a frank redislocation history with subcritical glenoid bone loss (<15%), nonengaged Hill-Sachs lesion, or off-track lesion. Minimum 2-year postoperative outcomes were evaluated using shoulder range of motion (ROM), the Rowe score, the American Shoulder and Elbow Surgeons (ASES) score, apprehension, and the redislocation rate. Postoperative shoulder anteroposterior radiographs were assessed to evaluate arthritic changes in the glenohumeral joint.

Results: The mean patient age was 28.1 ± 6.5 years, and the mean time between primary Bankart repair and revision surgery was 5.4 ± 4.1 years. Compared with the number of suture anchors used in the primary operation, significantly more all-suture anchors were inserted in the revision surgery (3.1 ± 0.5 vs 5.8 ± 1.3, $P < .001$). During the mean follow-up period of 31.8 ± 10.1 months, 3 patients (10.7%) required reoperation because of traumatic redislocation and symptomatic instability. Of patients with symptoms that did not require reoperation, 2 patients (7.1%) had subjective instability with apprehension depending on the arm position. There was no significant change between preoperative and postoperative ROM. However, ASES (preoperative: 61.2 ± 13.3 to postoperative: 81.4 ± 10.4, $P < .01$) and Rowe (preoperative: 48.7 ± 9.3 to postoperative: 81.7 ± 13.2, $P < .01$) scores were significantly improved after revision surgery. Eight patients (28.6%) showed arthritic changes in the glenohumeral joint on final plain anteroposterior radiographs.

Conclusion: Revision arthroscopic labral repair using all-suture anchors demonstrated satisfactory 2-year clinical outcomes in terms of functional improvement. Postoperative stability was obtained in 82% of patients without recurrent shoulder instability after failed arthroscopic Bankart repair.

Keywords: all-suture anchor; anterior shoulder instability; labral repair; revision arthroscopic labral repair

Arthroscopic Bankart repair for anterior glenohumeral instability without critical glenoid bone loss provided reliable clinical results, with 4% to 23% recurrent instability rates and 97.5% of patients able to return to sports.[1,20,25] However, based on the midterm follow-up clinical results, there was a risk of revision surgery in 5% to 15% of patients after primary arthroscopic Bankart repair.[30] Revision surgery may be clinically considered for recurrent instability and subjective symptoms that persist after failed primary repair, and the selection of method for revision surgery is determined according to the degree of glenoid bone defect and whether the Hill-Sachs lesion is the engaging or off-track type.[30] However, in the case of subcritical glenoid bone loss and a nonengaged Hill-Sachs lesion, whether

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surgery is optimal is debatable. In this situation, revision arthroscopic labral repair is a suitable surgical treatment because it has numerous advantages such as anatomic labral repair, reduced morbidity, and the ability for simultaneous treatment for intra-articular pathologies detected by arthroscopic examination.[30]

In numerous clinical studies of primary or revision arthroscopic labral repair, inserting a sufficient number of suture anchors at appropriate locations for anatomically important capsulolabral reconstruction of the inferior glenoid leads to better stability and clinical outcomes than the use of 3 or fewer sutures during labral repair.[2,13,27] To implant a sufficient number of suture anchors at the optimal position in the glenoid during revision arthroscopic labral repair while avoiding suture anchors previously inserted during the primary repair, all-suture anchors may be preferred as they have different characteristics than conventional solid anchors.[4] The performance of all-suture anchors is biomechanically equivalent to that of biocomposite suture anchors; all-suture anchors result in bone preservation because of their small diameters and allow access to the inferior glenoid using a curved guide.[5,9,17]

Clinical comparison studies indicate that when all-suture anchors are used in primary arthroscopic Bankart repair, more anchors can be implanted at optimal positions with clinical outcomes comparable to those of biocomposite solid anchors.[17] In revision arthroscopic labral repair, it is sometimes difficult to newly insert a sufficient number of suture anchors in appropriate positions because of the presence of suture anchors previously inserted into the glenoid in primary arthroscopic Bankart repair. Nevertheless, there has been no analysis of clinical outcomes of revision arthroscopic labral repair when all-suture anchors are used.

The purpose of this study was to investigate the clinical efficacy of all-suture anchors in patients with revision arthroscopic labral repair. Our hypothesis was that the use of all-suture anchors would allow the proper number of suture anchors to be inserted in favorable positions during revision arthroscopic labral repair.

METHODS

Patient Selection

The study protocol was approved by our institutional review board, and informed consent was obtained from all participants. Of the 44 patients who underwent revision arthroscopic labral repair for failed primary arthroscopic Bankart repair between April 2013 and January 2020 at our institution, we enrolled patients who underwent surgery in which only all-suture anchors were used. Included in the study were patients (1) who had undergone arthroscopic Bankart repair with suture anchors as the primary operation; (2) with anterior glenoid bone loss of $<15\%$ at the time of revision surgery[30]; (3) with residual instability and frank redislocation history, observed even after a sufficient rehabilitation period after primary arthroscopic Bankart repair; (4) who underwent revision surgery with a simple-suture technique with a single type of all-suture anchor; and (5) who had at least 2 years of clinical follow-up data. Patients were excluded for the following reasons: (1) only superior labral anterior-posterior (SLAP) or posterior labral lesions had been repaired (ie, no Bankart repair) in the primary operation; (2) concomitant procedures, including biceps tenodesis, panlabral repair, or rotator cuff repair, were performed during the primary Bankart repair; (3) patients had large bony Bankart lesions requiring bone healing by proper fixation of the fragment; (4) remplissage had been performed to engage Hill-Sachs lesions during the revision surgery; (5) patients had a history of unresolved brachial plexus injuries or uncontrolled seizures; or (6) shoulder instability was predominantly multidirectional with generalized ligament hyperlaxity.[15]

Surgical Technique and Postoperative Rehabilitation

A single surgeon (S.-J.S.) performed revision arthroscopic labral repair on patients in the lateral decubitus position under general anesthesia. After penetrating sufficient capsulolabral tissue using a suture hook, the anterior capsulolabral complex was restored by the simple suture technique using single-loaded all-suture anchors (1.3-mm FiberTak; Arthrex). Without decortication on the glenoid rim from 3 o'clock to 6 o'clock, the anchors were inserted at intervals of 5 to 7 mm (Figure 1). When a SLAP lesion was observed, 1 or 2 all-suture anchors were inserted to repair the lesion. For posterior labral tears requiring repair, all-suture anchors were inserted according to the extent of the posterior labral tear.

The same postoperative rehabilitation protocol was applied to all patients. Shoulder immobilization supported by an abduction brace was prescribed for the first 4 weeks. At the beginning of the fifth week, passive range of motion (ROM) and active-assisted exercises were encouraged after

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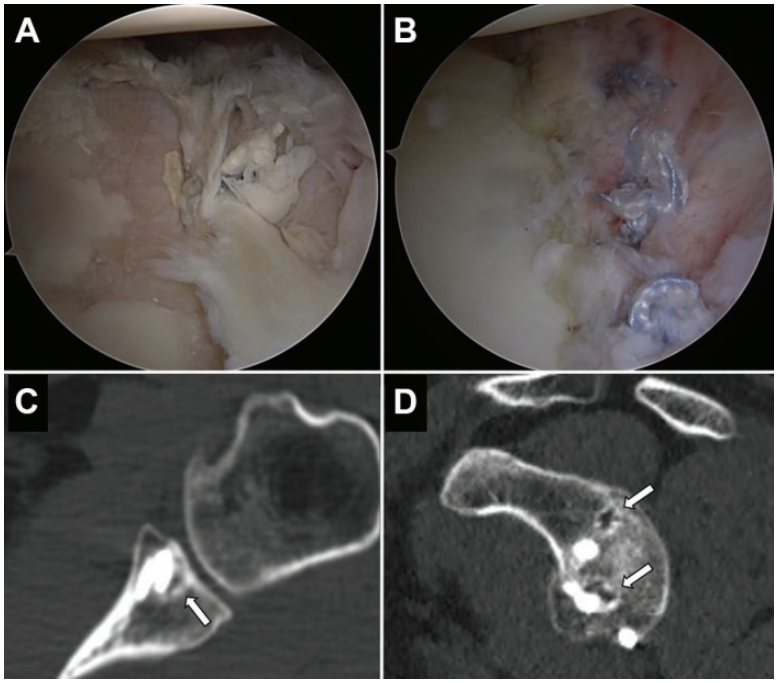

Figure 1. Images obtained from a 31-year-old male who underwent revision arthroscopic labral repair for his left shoulder with 6 all-suture anchors after a failed arthroscopic Bankart repair with 4 metal suture anchors. (A) A torn labrum with residual suture materials and cartilage defect of the glenoid rim seen through the anterosuperior portal view. (B) The repaired capsulolabral complex completely covered the decorticated glenoid rim with proper tension and suture intervals. On 1-year postoperative computed tomography scans, (C) the tunnel of the all-suture anchor adjacent to the medial side of the metal anchors was observed in the axial image (arrow), and (D) multiple tunnels of all-suture anchors with high attenuation of boundaries were seen in the sagittal image (arrows).

discontinuation of the immobilization. Shoulder muscle strengthening exercises were allowed after 8 weeks postoperatively. Return to sports was allowed 6 months postoperatively when shoulder ROM and strength had been recovered without recurrent instability.

Clinical Outcomes and Radiological Evaluation

All patients returned for follow-up assessments at 3, 6, and 12 months and then yearly. Two shoulder surgeons who did not directly participate in the surgical operation independently evaluated patients' characteristics and clinical results, including shoulder ROM, visual analog scale (VAS), Rowe score, and American Shoulder and Elbow Surgeons (ASES) score, preoperatively and postoperatively at the last visit. The clinical statuses and surgical records of the patients in this study before primary arthroscopic Bankart repair, and the follow-up progress after surgery, were reviewed and recorded. Surgical failure was defined as cases in which the patient complained of nontraumatic redislocation or subluxation and symptomatic instability after surgery that was severe enough to consider revision surgery.

The presence of bony Bankart lesions or rim fractures was also recorded. Labral lesions were divided into 3 parts according to their location: the superior labrum included the 1- to 11-o'clock area, the anteroinferior labrum included the 2- to 6-o'clock area, and the posterior labrum included the 6- to 11-o'clock area (Figure 2). From the anteroposterior view, of the most recent postoperative radiographs, glenohumeral joint arthrosis was identified based on the presence of osteophytes in the inferior glenoid or humeral head or joint space narrowing corresponding to stage 1 commonly described in the Samilson-Prieto classification by a single independent radiologist.[12,16]

Statistical Analysis

The sample size was determined by the interim results of the initial 10 patients in this study. The Rowe score of the initial 10 patients who underwent a revision arthroscopic labral repair with all-suture anchors was compared with the result of 349 patients who underwent a revision arthroscopic Bankart repair in the previous studies.[2] The effect size was set as 0.75 in the comparison between preoperative and postoperative status. A sample size of 23 ± 1 patients showed a statistical power of 80% with type 1 error and an α value of .05 to detect significant differences in the Rowe score. Considering a 15% dropout rate, the final sample size was set at 27 patients.

Descriptive statistics were performed to calculate means and standard deviations from continuous variables. Paired *t* tests were applied to analyze the differences between preoperative and postoperative ROM, VAS, and Rowe and

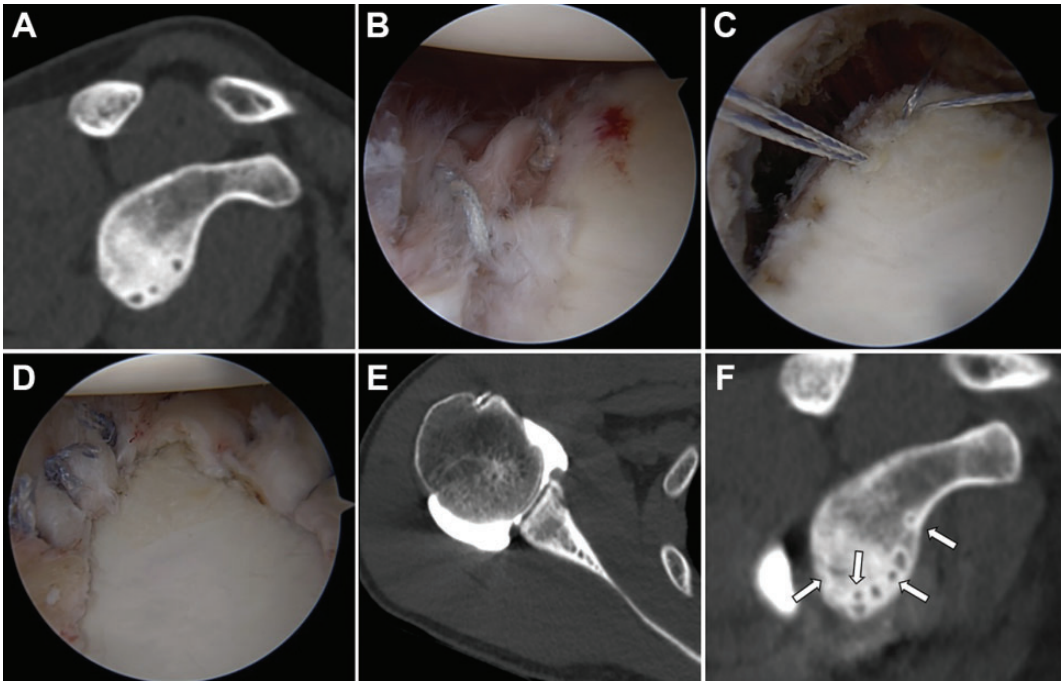

Figure 2. Images obtained from a 27-year-old male who underwent revision arthroscopic labral repair for his right shoulder with 7 all-suture anchors after failed arthroscopic Bankart repair with 4 all-suture anchors. (A) The lower attenuated tunnels of 3 suture anchors previously inserted at the anteroinferior glenoid were noted, and another tunnel of a previous suture anchor at the 7-o'clock position showed similar attenuation with nearby glenoid bone in the sagittal image of the preoperative computed tomography (CT) scan. (B) An initial arthroscopic examination indicated a retorn capsulolabral complex from the glenoid rim, degeneration of cartilage of the anterior glenoid, and the presence of previous suture anchors. (C) After removal of the remnant suture materials of previous suture anchors and sufficient release of the capsulolabral complex from the glenoid along the torn or collapsed site between the anteroinferior and posterior glenoid, new all-suture anchors were inserted at the desired positions. (D) From the 3-o'clock to 8:30 clockface positions, the capsulolabral complex was repaired using a simple suture technique with 7 single-stranded all-suture anchors. (E) A healed labrum and bone absorption of the tunnel caused by the all-suture anchor were identified in the axial image of the 2-year postoperative CT arthrogram. (F) In the sagittal image of the postoperative CT arthrogram, newly developed tunnels due to all-suture anchors implanted during revision surgery were observed around previous multiple tunnels due to the all-suture anchors used in the primary surgery.

ASES scores. Categorical variables, such as the number of inserted anchors, were compared using the Pearson chi-square test. Statistical calculations were performed with SPSS Version 21.0 (IBM), and $P < .05$ was used to determine statistical significance.

RESULTS

Of the 44 patients, 28 met the inclusion criteria. Eight patients who underwent revision arthroscopic labral repair with solid anchors were excluded. One patient who underwent rotator cuff repair for concomitant rotator cuff tears and 1 patient who had a history of primary open Bankart repair at another institution were also excluded. Two patients were excluded because their bone fragments were large (fragment width, >5 mm), requiring reattachment to the glenoid using the suture bridge technique, and 1 patient was confirmed to have intraoperative engagement and a concomitant remplissage procedure was performed. One patient with poorly controlled epilepsy and redislocation due to recurrent seizure events was also excluded. Two patients were not followed up for >2 years during the observation period of this study.

The patients' demographic data and preoperative clinical status are described in Table 1. Of 28 patients, 18 patients (64.3%) were involved in noncontact sports. The time interval between primary arthroscopic Bankart repair and revisional surgery was 5.4 ± 4.1 years. Two patients (7.1%) had bone fragments that did not require additional bone fragment fixation and were not large enough to be treated by conventional labral repair. The mean anterior bone loss measured by preoperative 3-dimensional computed tomography (3D-CT) of patients included in this study was 8.2% ± 2.6%. Using the measurement method introduced in a previous study, it was estimated that 1 patient (3.6%) had an off-track Hill-Sachs lesion when preoperative 3D-CT was carried out on the patients.

The mean follow-up period for patients enrolled in this study was 31.8 ± 10.1 months. Of the 28 patients who underwent the primary arthroscopic Bankart repair, 21 patients (75.0%) underwent only Bankart repair for anteroinferior

TABLE 1
Patient Characteristics and Preoperative Status (N = 28)[a]

Variable	Value
Sex, male/female, n	26:2
Age at first dislocation, y	20.0 ± 3.7
Age at first operation, y	22.6 ± 4.5
Age at revision operation, y	28.1 ± 6.5
Symptom duration after primary operation, mo	20.0 ± 14.4
No. of dislocations after primary operation	3.4 ± 4.8
Excessive ligamentous laxity	6 (21.4)
Body mass index	25.2 ± 5.1
Dominant shoulder	17 (60.7)
Bony Bankart	2 (7.1)
Glenoid defect, %[b]	8.2 ± 2.6
Glenohumeral arthritis	5 (17.9)
Preoperative functional scores	
VAS	2.1 ± 1.7
ASES	61.2 ± 13.3
Rowe	48.7 ± 9.3
Preoperative sports level	
Professional	0 (0)
Elite	3 (10.7)
Recreational	15 (53.6)
No sport	10 (35.7)

[a]Values are reported as mean ± SD or n (%) unless otherwise indicated. ASES, American Shoulder and Elbow Surgeons; VAS, visual analog scale.
[b]Reported as percentage of bone loss in the anteroinferior glenoid.

TABLE 2
Intra-articular Labral Lesion[a]

Labral Pathology	Primary Surgery	Revision Surgery
Isolated Bankart lesion	21 (75.0)	15 (53.6)
Bankart lesion + SLAP lesion	7 (25.0)	4 (14.3)
Bankart lesion + posterior labral tear	None	7 (25.0)
Panlabral tear	None	2 (7.1)

[a]Values are reported as n (%). SLAP, superior labral anterior-posterior.

capsulolabral injury; of the 7 patients (25.0%) with confirmed SLAP lesions, 6 patients underwent repair using suture anchors, and 1 patient underwent arthroscopic debridement. None of these patients underwent posterior labral repair during the primary arthroscopic Bankart repair. However, when performing revision arthroscopic labral repair, the labral injury was more extensive in arthroscopic findings compared with the time of the primary arthroscopic Bankart repair (Table 2).

During revision surgery, repair was not performed on the SLAP lesions identified in 4 patients with Bankart lesions and SLAP tears. However, SLAP repair was performed in 2 patients with panlabral tears. The number of suture anchors inserted during the revision surgery was significantly greater than the number used during the primary surgery (primary, 3.1 ± 0.5; revision, 5.8 ± 1.3; $P < .01$) (Table 3). The following suture anchor materials were used in the primary surgery: metal anchors (1 patient, 3.6%), all-suture anchors (2 patients, 7.1%), and biodegradable anchors (25 patients, 89.3%).

TABLE 3
Number of All-Suture Anchors Inserted During Primary and Revision Surgeries[a]

	Anteroinferior	Superior	Posterior	Total
Primary surgery	2.8 ± 0.4	0.3 ± 0.4	0	3.1 ± 0.5
Revision surgery	4.6 ± 0.8	0.3 ± 0.6	0.9 ± 1.1	5.8 ± 1.3

[a]Values are reported as mean ± SD.

TABLE 4
Postoperative Complications and Clinical Outcomes[a]

Variable	Value
Total rate of recurrent instability	5 (17.9)
Subjective instability	2 (7.1)
Subluxation	1 (3.6)
Redislocation	2 (7.1)
Glenohumeral arthritis[b]	8 (28.6)
Stiffness	10 (35.7)
Persistent pain	9 (32.1)
Functional outcomes	
VAS	1.4 ± 1.4
ASES	81.4 ± 10.4
Rowe	81.7 ± 13.2
Return to sport (n = 18)[c]	14 (77.8)
Same level	9 (50)
Lower level	5 (27.8)

[a]Values are reported as mean ± SD or n (%). ASES, American Shoulder and Elbow Surgeons; VAS, visual analog scale.
[b]Identified in the Grashey view of a shoulder anteroposterior radiograph, which was taken at the last visit.
[c]Number of patients who returned to sports at the same or lower level among the 18 patients who were involved in preoperative sports activity.

The postoperative clinical outcomes of this study are shown in Table 4. Significant improvement was seen in the postoperative VAS ($P = .04$), Rowe score ($P < .01$), and ASES score ($P < .01$) compared with the preoperative data. However, there were no significant differences in postoperative anterior forward flexion (154.8° ± 25.2° preoperatively vs 149.8° ± 18.4° postoperatively, $P = .83$) or external rotation (70.2° ± 18.3° preoperatively vs 62.8° ± 16.2° postoperatively, $P = .76$) compared with the preoperative values. Subjective instability without frank redislocation or subluxation after nonoperative treatment was observed in 2 patients (7.1%); a second revision surgery was not considered because their symptoms were tolerable. Postoperative redislocation and subluxation were noted in 2 patients (7.1%) and 1 patient (3.6%), respectively. In 8 patients (28.6%), grade 1 arthritic changes in the glenohumeral joint were demonstrated on their final shoulder anteroposterior radiographs.

During the observation period, 2 patients (7.1%) with redislocation and 1 patient (3.6%) with recurrent

subluxation underwent re-revision surgery because of marked instability, and all 3 patients (10.7%) underwent open Latarjet procedures for their re-revision surgeries. These 3 patients had revision arthroscopic labral repair for anteroinferior labral lesions. In addition, 1 patient who had minor trauma while boxing 9 months after revision Bankart and posterior labral repair and 1 patient who developed symptoms after an injury due to a fall 6 months postoperatively complained of persistent subjective instability. However, the patients did not choose re-revision surgery and underwent nonoperative treatment, including muscle strength exercises and lifestyle modifications.

DISCUSSION

In this study, revision arthroscopic labral repair using all-suture anchors in patients without critical glenoid bone loss after failed arthroscopic Bankart repair achieved satisfactory clinical outcomes by the insertion of sufficient numbers of all-suture anchors. Functional recovery and recurrent shoulder instability equivalent or superior to previously reported results of revision arthroscopic labral repair using conventional solid anchors were confirmed.[2,8,13,27]

Previous studies on clinical outcomes of revision arthroscopic labral repair reported that satisfactory results were obtained when patients were appropriately selected as candidates for surgery.[8,14,27,31] Anterior glenoid bone loss after failed arthroscopic Bankart repair is considered the most important factor in determining the surgical method for revision surgery, and arthroscopic stabilization can be considered in patients with glenoid bone loss $<15\%$.[30] In patients with subcritical glenoid bone loss, revision arthroscopic labral repair showed outcomes comparable to those of the arthroscopic Latarjet procedure after failed Bankart repair.[15] Among these patients with subcritical bone loss, it is necessary to select a surgical method according to the presence of engaging or off-track Hill-Sachs lesions. Su et al[27] analyzed 65 patients who had undergone revision arthroscopic labral repair and reported that the presence of off-track Hill-Sachs lesions, age younger than 22 years, and ligamentous laxity were factors significantly affecting postoperative recurrence. It is inferred that the patients enrolled in this study showed similar or better results compared with other previous studies because their characteristics indicated an average age of 28 years with relatively low levels of sports activities, and relatively few had ligament laxity.[8,13,31] In a systematic review of 433 patients who underwent revision arthroscopic labral repair, recurrent instability was found in 26.2%, similar to our results.[14] The reduced recurrent instability in our study may be due to the use of sufficient numbers, which allowed more points of insertion of suture anchors.

Several clinical studies have shown that inserting a sufficient number of suture anchors at proper positions on the anteroinferior glenoid is related to stability and better clinical outcomes in arthroscopic labral repair.[6,7,13] Clinical efficacy and radiological characteristics of all-suture anchors have already been proven in primary arthroscopic Bankart repair.[17,29] It has been reported that all-suture anchors are equivalent to conventional suture anchors in terms of biomechanical strength and clinical safety.[4,17,23,29] In our clinical series, a significantly larger number of anchors were implanted in the anteroinferior glenoid for SLAP and posterior labral repair compared with primary arthroscopic Bankart repair. Since the initial diameter of most all-suture anchors is about half that of conventional solid anchors, initial bone loss is minimized, and the availability of curved guides helps to achieve optimal results in revision surgery.[4] However, Nakagawa et al[21] reported that when excessive amounts of all-suture anchors are inserted in a row in a limited space, glenoid rim fractures at the anchor insertion sites could occur with postoperative recurrence of instability during contact sports or overhead activities. In our study, there were no patients with glenoid rim fractures after revision surgery, which resulted from the lower levels of sports activity of the patients and the short-term follow-up with fewer potential athletic exposures.

In contrast to biocomposite suture anchors, which maintained the anchor trabecular bone interface, the pull-out strength of all-suture anchors was significantly correlated with the adjacent cortical thickness in several biomechanical studies.[22,23] Based on such biomechanical properties, minimal or no decortication of the glenoid rim before insertion of all-suture anchors might provide greater pull-out force than meticulous decortication, which is traditionally performed to maximize healing potential at the tendon-bone interface.[22] In our study, it is thought that the surgeon maximized the pull-out force of the all-suture anchor by preserving as much cortical thickness as possible because no decortication was performed during any of the operations. In addition, although the time interval between the primary operation and the revision labral repair was long enough to allow completion of the biological changes, such as the perianchor reaction or bone ingrowth of the suture anchor used in the primary arthroscopic Bankart repair, bone quality may differ because the suture anchor should be inserted in a similar location to the previous suture anchor. All-suture anchors are relatively less dependent on bone quality compared with biodegradable or metal suture anchors.[26] Therefore, all-suture anchors can be chosen when the bone quality of the cancellous portion in the glenoid is predicted to be poor because of perianchor reactions or insufficient bone ingrowth of the previous suture anchors when the cortex of the glenoid rim is relatively preserved.

Several comparative studies on revision arthroscopic labral repair and the Latarjet procedure after failed primary arthroscopic Bankart repair reported that the Latarjet procedure showed lower rates of redislocation and surgical failure. In particular, it is considered clinically important to provide sufficient surgical treatment for lesions that extend to the posterior labrum or are additionally identified. When repair was performed on extensive labral tears, such as panlabral tears that occurred during primary arthroscopic Bankart repair, the recurrence of instability was relatively low after surgery, and pain caused by panlabral tears was significantly improved through arthroscopic repair.[19,24,28] In primary Bankart repairs, it was

reported that combining labral repair did not negatively affect postoperative shoulder function and ROM and provided lower recurrence rates and functional outcomes.[3] In our study, although some patients showed osteoarthritic changes, there was no reduction in the shoulder ROM of active forward flexion and external rotation after revision surgery. Therefore, a satisfactory clinical outcome after revision arthroscopic labral repair can be expected when a pathology is treated after careful inspection of labral lesions other than the Bankart lesions.

Although the observation period of our study was a minimum of 2 years, arthritic changes in the glenohumeral joint after labral repair using suture anchors further progressed in 3 patients, and the final rate was relatively high at 27.6%. Franceschi et al[12] analyzed 60 patients with an average age of 27 years who underwent primary arthroscopic Bankart repair and reported that 21.8% of them newly developed osteoarthritis, and as the number of suture anchors used during arthroscopic Bankart repair increased, the incidence of osteoarthritis increased during the 8-year follow-up period. Another study with an average follow-up of 8 years after arthroscopic Bankart repair using absorbable suture anchors revealed that 41% of the shoulders exhibited arthropathic changes, and in 24%, the drill holes had not yet radiographically healed, although these findings were not related to clinical outcomes. These arthritic changes can progress even after revision arthroscopic labral repair.[10]

Limitations

This study had several limitations. First, it was a retrospective study with a small number of patients. Clinical outcomes of shoulder instability may differ due to various factors, such as the patient's age, sports activities, ligament hyperlaxity, the presence of an engaging Hill-Sachs lesion, and whether concomitant treatment for additional pathologies should be performed; thus, there is a possibility of selection bias.[18,27] However, previous clinical studies on arthroscopic revision Bankart repair also observed only a small number of patients because the indications for surgery were limited.[14] Second, since the follow-up period was relatively short, it was difficult to identify the long-term results; it is possible that the rate of recurrent instability and arthritic changes of the glenohumeral joint will increase with a longer follow-up period.[11,20] Third, we did not directly compare the clinical results of patients who received revision arthroscopic labral repair with all-suture anchors with those of patients who received conventional biodegradable anchors by the same surgeon. Since previous studies that have reported the clinical results of revision arthroscopic Bankart repair were only performed with conventional suture anchors, these results can only be compared indirectly. In terms of development of postoperative arthritis, there was no direct comparison with knotless suture anchors in this study. Fourth, most patients included in this study had low levels of sports activities and were not professional or elite athletes who played contact sports. Since the preinjury sports activity level affects the decision about the surgical method and the recovery time or postoperative physical performance, these patients were selectively included in this study because the indications for revision arthroscopic labral repair were limited.[1]

CONCLUSION

Revision arthroscopic labral repair using all-suture anchors demonstrated satisfactory 2-year clinical outcomes in terms of functional improvement. Postoperative stability was obtained in 82% of patients without recurrent shoulder instability after failed arthroscopic Bankart repair.

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