European Journal of Orthopaedic Surgery & Traumatology (2024) 34:3289–3295
https://doi.org/10.1007/s00590-024-04072-9

ORIGINAL ARTICLE

Comparison between arthroscopic Bankart repair versus arthroscopic Bankart/SLAP lesion repair in limited-contact athletes with type V SLAP lesion. A prospective cohort study

Iván José Bitar[1,2] · **Christian Allende Nores**[1] · **Lucas Daniel Marangoni**[1] · **Damian Gabriel Bustos**[1] · **Luciano Pezzutti**[1] · **Lucia Belen Bitar**[1]

Received: 21 May 2024 / Accepted: 5 August 2024 / Published online: 13 August 2024

Abstract

Purpose The aim of this study was to compare the functional outcomes, recurrence rate, range of motion (ROM) and return to sports activities between arthroscopic Bankart repair (ABR) versus arthroscopic Bankart/SLAP repair (ABR/S) in limited contact-athletes with a type V SLAP lesion in the scenario of recurrent anterior shoulder instability (RASI). Our hypothesis was that there is no difference between the two treatments.

Methods Two groups of 45 limited-contact athletes with type V SLAP lesion were created. Group 1 underwent an arthroscopic Bankart repair, while group 2 had an arthroscopic Bankart/SLAP repair. The minimum follow-up period was 2 years. The WOSI and ASES scores were used to assess primary functional outcomes. Recurrence rate, ROM and return to sport were also evaluated.

Results Significant differences were reported in the WOSI and ASES scores pre- and post-operatively in each group. There were no significant differences between the two groups ($P = 0.78$ and 0.43). We reported 4 recurrences (8.8 %) in group 1 and 5 (11.1 %) in group 2, with no difference between them ($P = 0.62$). There were no significant differences between the range of motion of each of the groups as well as between them. More than 90% of the athletes in both groups returned to their previous sporting activities.

Conclusions Limited-contact athletes with RASI who have a type V SLAP lesion as their primary diagnosis can be treated using either ABR or ABR/S with equal efficacy. Both treatment alternatives preserve athlete's function, stability, ROM and return to sport.

Keywords Bankart repair · SLAP repair · Anterior shoulder instability · Contact athletes · SLAP type V

Introduction

In athletes with RASI, selecting the appropriate surgery is always controversial. Patient's age, type of sport and bipolar bone defect (BBD) are the main risk factors [1]. In our setting, probably the most common clinical presentation of a patient with RASI is a limited-contact athlete, < 30 years old, with or without subcritical glenoid bone defect (SGBL) and on-track Hill Sachs lesion (HSL). According to the surgeon's preference, this patient can be treated with an arthroscopic Bankart repair plus remplissage (ABR + R), open Bankart repair plus inferior capsular shift (OBICS) or the Latarjet procedure (LA) in some European countries [2, 3]. However, some current algorithms still recommend an isolated arthroscopic Bankart repair (IABR) [4, 5]. The Bankart lesion, a detachment of the anteroinferior glenoid

✉ Iván José Bitar
ivanbitardoc@gmail.com

Christian Allende Nores
Christian_allende@hotmail.com

Lucas Daniel Marangoni
drldmarangoni@gmail.com

Damian Gabriel Bustos
damian5bustos@hotmail.com

Luciano Pezzutti
lucianopezzutti@gmail.com

Lucia Belen Bitar
luciabbitar@gmail.com

[1] Sanatorio Allende, Avenida Hipólito Irigoyen 384, Nueva Córdoba, CP 5000 Córdoba, Argentina

[2] Present Address: Córdoba, Argentina

labrum that typically extends from the 2 o'clock position to the 6 o'clock position, is considered the "essential" lesion in patients with RASI [6]. Clinical studies have described a wide variety of Bankart lesion variants as well as combined labral lesions [7]. One of these is the Bankart lesion combined with a type II SLAP lesion (Superior, Labral, Anterior to Posterior) referred to as type V SLAP lesion by Maffet et al. [8]. In athletes with RASI, the incidence of type V SLAP lesions can range from 20 to 57% [9]. Studies report that type II SLAP lesions may cause increased glenohumeral translation, which may be augmented if it is associated with a Bankart lesion [10, 11]. Several studies have reported that the repair of type V SLAP lesions is associated with promising results including low recurrence rate, good function and early return to sport [12, 13]. However, other studies have also found some complications, probably related to the large repair of the injured labral segment. These include loss of ROM, slow postoperative ROM recovery and slow return to sports [14, 15]. As a treatment alternative, open or arthroscopic Bankart repair without SLAP lesion repair may offer a minor labral repair with probably similar results [16, 17]. To our knowledge, only one prospective study has evaluated the clinical effect of an extended labral repair in patients with type V SLAP lesions [16]. The aim of this study was to compare the functional outcomes, recurrence rate, ROM and return to sport between ABR versus (vs.) ABR/S in limited-contact athletes with type V SLAP lesions in the RASI scenario. Our hypothesis was that there is no difference between the two treatments.

Methods

Study design and patient selection

Over the last 8 years we conducted a prospective study in which 108 athletes with RASI agreed to participate. Only 90 completed the study with a minimum follow-up of 2 years. Informed consent was obtained from all patients. This study was approved by the ethics committee of our hospital. RASI was defined as the presence of two or more episodes of dislocation and/or subluxation. Hyperlaxity was defined as external rotation (ER) > 85° and/or Gagey hyperabduction test > 100°. According to the American Academy of Pediatrics Committee on Sports Medicine (AAPCSM), sports such as basketball, volleyball, artistic gymnastics, hockey, bodybuilding, martial arts and skateboarding were considered limited-contact sports. Limited-contact athletes with RASI ≥ 16 years and ≤ 30 years with a diagnosis of type V SLAP lesion were included in this study. Variants of Bankart lesion (ALPSA, Perthes, or GLAD) as well as athletes with SGBL ≤ 10% and on-track HSL were included. Athletes with hyperlaxity were also included. We excluded bony Bankart lesion, triple labral lesion, collision athletes, 1st episode of anterior instability, athletes with previous surgeries, degenerative joint changes, rotator cuff rupture, pain as the main symptom, multidirectional instability or voluntary instability. Two study groups of 45 patients each were formed. Group 1 was treated with ABR while group 2 with ABR/S. Surgical treatment was performed by two surgeons with more than 15 years of experience in shoulder surgery. It was decided that surgeon "A" would perform all surgeries in group 1 while surgeon "B" would conduct all surgeries in group 2 (Fig. 1).

Surgical technique

All operations were performed under general anaesthesia. Patients were placed in the lateral decubitus position with the arm in 60° abduction. Bankart repair was initially performed through three portals; a standard posterior visualization portal and two working portals, anterosuperior and anteroinferior. Arthroscopic labral examination was performed to look for a type V SLAP lesion. The labral margin of the glenoid rim was mobilized with a curette from the 2 o'clock to the 7 o'clock position. The bony margin was decorticated with an arthroscopic rasp to create a bleeding bone bed. The first anchor was placed in the 5 o'clock position through the anteroinferior portal at 1–2 mm from the articular cartilage of the glenoid rim. We used single suture non-absorbable polymer (Peek) anchors in all cases. Through the anteroinferior portal and using a spectrum set loaded with 1–0 polydioxadone monofilament suture, the joint capsule was penetrated 1 cm from the glenoid rim under the anteroinferior labrum. The anchor suture was used to attach the labrum to the glenoid rim by a sliding knot. Additional anchors were placed in the 4 o'clock and 3 o'clock positions. In some cases, an additional anchor was placed in the posteroinferior location through a portal in the 7 o'clock position. In group 2, an additional Wilmington portal was created to facilitate SLAP repair. In all cases, 2 anchors were used, one of them was placed in the 11 o'clock position and the other in the 1 o'clock position.

Rehabilitation protocol

The rehabilitation process was similar in both groups. A sling with the shoulder in internal rotation was used as a means of protection for 6 weeks. Active flexion and extension of the elbow as well as progressive ER up to 25° were allowed. From 6 weeks onwards, exercises were started to improve ER and shoulder elevation. Muscle strengthening exercises of the rotator cuff and scapular muscles were performed after 8 weeks. Depending on the patient, return to sport was allowed after 6 months.

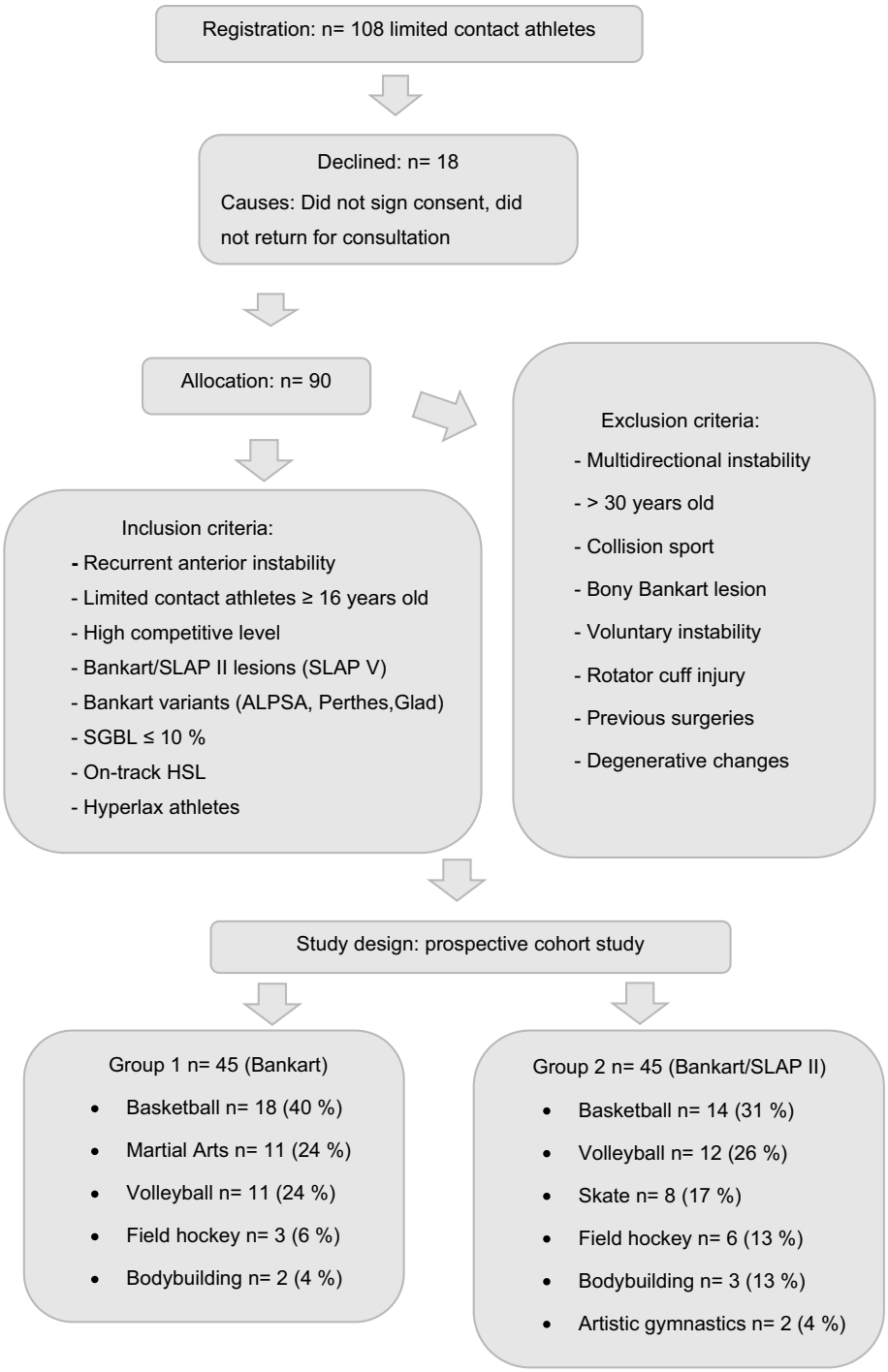

Fig. 1 Methodological diagram, limited contact sports, group conformation and inclusion and exclusion criteria

Clinical and functional assessment

The WOSI score and the ASES scale were used to measure primary functional outcomes. It is important to stress that the WOSI score was converted to a value from 0 to 100, with a higher score representing a better quality of life. All patients were evaluated pre and postoperatively and then between groups. The recurrence rate was assessed between the two groups. Using a manual goniometer, pre and postoperative ROM were measured for each group, as well as between them. Return to pre-injury sports activities was also evaluated. Like Jeon et al., we classified the levels of postoperative sports activities into 4 grades [18]. All evaluations were conducted at six months, one year and at least two years' follow-up. Postoperative examinations were performed by the same surgeons.

Image assessment

All athletes underwent frontal X-rays in external rotation (ER), internal rotation (IR) and axial view as well as magnetic resonance imaging (MRI). Three-dimensional CT scan with image subtraction was only performed in those patients who presented BBD. The "best circle" method and the glenoid track (GT) concept were used to assess whether the patient had SGBL ≤ 10% as well as to define the type of HSL. Finally, arthroscopic visualisation confirmed the diagnosis of type V SLAP lesion.

Statistical analysis

Data were analysed with SPSS for Windows 7, version 18.0. A power analysis was performed based on a probable recurrence rate of 25%. The chi-square test or Fisher's exact test were used for categorical variables, and the independent t-test was used for continuous variables. The Bonferroni correction was applied for multiple comparisons. The Mann–Whitney U-test was used to investigate differences in the level of return to sport. Categorical data were presented as numbers or percentages, and continuous data as mean and standard deviation. A p-value < 0.05 was considered statistically significant.

Results

Demographic data, functional outcomes, ROM and return to previous sports activities

There were no significant differences between the demographic characteristics of the two groups (Table 1). The mean WOSI and ASES scores of each group reported significant differences between the pre- and postoperative period of each group. However, there were no significant differences in the WOSI and ASES scores between the two groups at the end of follow-up (Table 2). No significant differences were found between the pre- and postoperative ROM of each group. There were also no differences between the two groups at the end of follow-up (Table 2). Most patients returned to sport after 6 months. There was no difference in the level of return to sport activities between the two groups (Table 2).

Recurrence of instability

At the end of follow-up, 4 patients (8.8%) in group 1 and 5 patients (11.1%) in group 2 had recurrence of instability. These results were not significant ($p = 0.62$). Three basketball players in group 1 had recurrence in the form of dislocation and one martial arts patient had a subluxation. All were high-energy episodes in abduction and ER.

Table 1 Baseline demographic characteristics of included patients

Variables		Group 1	Group 2	p-value
Patients (nº)	90	45	45	–
Sex (nº)				0.87
Male/Female		35/10	38/7	0.46
Average age (min- max)		22.5 (16–30)	23.7 (16–26)	0.52
Involved dominant shoulder (nº)		40	38	0.81
Time between Surgery/Injury (y)		3.8 (0.8–6)	4.4 (1–8)	0.79
Side (right/left)		40/5	42/3	0.28
Hyperlaxity		18	25	0.33
Follow up (mo)		30.2 (24–39)	27.3 (24–41)	0.18
Bankart variants (nº, %)		15 (33%)	18 (40%)	0.75
ALPSA (nº, %)		10 (66.6%)	14 (77.7%)	
GLAD (nº, %)		3 (20%)	2 (11.1%)	
Perthes (nº, %)		2 (13.3%)	2 (11.1%)	
Bone loss (nº, %)				
Patients nº/SGBL		14/45 (31.1%)	18/45 (40%)	0.31
Patients nº/HSL		45/45 (100%)	42/45 (93.3%)	0.55
Mean SGBL		5.2% (0–10%)	6.7% (0–10%)	0.48
Mean width HSL		9.2 mm (0–18 mm)	7.8 mm (0–15 mm)	0.19

ALPSA Anterior Labral Periosteal Sleeve Avulsion, *GLAD* Glenoid Labrum Articular Disruption, *SGBL* Subcritical glenoid bone loss, *HSL* Hill Sachs lesion

Table 2 Functional outcomes, ROM and Return to sporting level at final follow up evaluation. (Media—Standard deviation)

Score	Group 1			Group 2		
	Baseline	2 years	*P*-value	Baseline	2 years	*p*-value
WOSI	45.2 ± 15.3	86.6 ± 17.4	0.001	47.3 ± 14.1	87.3 ± 11.4	0.001
ASES	59.7 ± 12.8	90.2 ± 9.7	0.001	62.3 ± 19.3	91.8 ± 10.6	0.001
WOSI		86.6 ± 17.4			87.3 ± 11.4	0.78
ASES		90.2 ± 9.7			91.8 ± 10.6	0.43
ROM						
FF	166.3 ± 9.2	164.7 ± 10.1	0.17	165.9 ± 9.5	163.8 ± 10.8	0.67
IR 90º	71.2 ± 9.2	69.6 ± 8.5	0.39	70.8 ± 11.3	67.9 ± 10.6	0.47
ERs	58.9 ± 6.5	56.7 ± 9.2	0.44	59.3 ± 7.2	61.3 ± 9.3	0.81
ERa	76.1 ± 8.8	78.6 ± 7.9	0.27	77.2 ± 10.3	74.6 ± 8.8	0.58
ERs		56.7 ± 9.2			61.3 ± 9.3	0.81
ERa		78.6 ± 7.9			74.6 ± 8.8	0.39
RS						
Grade 1	17 (37.7%)			19 (42.2%)		0.62
Grade 2	26 (57.7%)			25 (55.5%)		0.32
Grade 3	2 (4.4%)			1 (2.2%)		0.51
Grade 4	0			0		–

WOSI Western Ontario Shoulder Instability Index, *ASES* American Shoulder and Elbow Surgeons, *ROM* Range of motion, *FF* Forward flexion, *IR 90º* Internal rotation at 90º, *ERs* External rotation at the side, *ERa* External rotation in abduction, *RS* Return to sport, *Grade 1* return to the same sport at the same level, *Grade 2* return to the same sport at a lower level, *Grade 3* cessation of the preinjury sport (change of sport) *Grade 4* cessation of sports activity

Table 3 Recurrent instability at final follow-up

	Group 1	Group 2	*p*-value
Recurrence nº (%)	4 (8.8%)	5 (11.1%)	0.62
Recurrence type	3 dislocations 1 subluxation	5 dislocations	
Traumatic/Atraumatic	4	5	
Sports (nº)	3 Basketball 1 Martial arts	2 Martial arts, 2 Artistic gymnastics 1 Basketball	
Age < 25 (nº)	4	4	
Hyperlaxity (nº)	4	5	
SGBL (nº)	4	5	
HSL (nº)	4	5	

SGBL Subcritical Glenoid Bone Loss, *HSL* Hill Sachs Lesion

All athletes were hyperlaxed, < 25 years old, with SGBL and HSL. Five athletes in group 2 had episodes of dislocation secondary to new traumatic events. Two were involved in martial arts, two in artistic gymnastics and one in basketball. Four of them were < 25 years old and all of them had hyperlaxity, SGBL and HSL (Table 3).

Discussion

This study has shown that limited-contact athletes with type V SLAP lesion can be treated with either an ABR or ABR/S without compromising shoulder function and stability. In an athlete with RASI, the selection of the best surgical procedure is closely related to risk factors [19]. According to the surgeon's preference, ABR + R, OBICS or LA are currently the best alternatives to reduce the rate of recurrence [3, 4]. However, some current algorithms still promote IABR in limited-contact athletes with SGBL ≤ 10% and on-track HSL [4, 5, 19] In a comparative study, Petrera et al. treated collision and contact athletes without glenoid bone defect with IABR [20] In turn, Yamamoto et al. conducted a retrospective study comparing contact vs. non-contact athletes in < 25 years treated with IABR. The authors do not mention how many patients had SGBL [21]. In our study, all patients were limited-contact athletes, with or without SGBL, on-track HSL and all of them were treated with IABR. Our study found no differences between the functional outcomes of the two groups. In a retrospective study conducted by Aydin et al. including patients with type V SLAP lesion comparing ABR vs ABR/S, the authors found no difference between the groups when assessing Constant and Rowe scores [14]. In a similar study, Lee et al. compared ABR vs ABR/S with no differences in the ASES, Rowe and Constant scores reported [17]. In surgical practice, when faced with an arthroscopic diagnosis of a type V SLAP lesion,

most colleagues will probably tend to repair both lesions. However, the evidence is unclear regarding the likely consequences of an extended labral repair. Biomechanical studies have reported a further increase in anteroinferior glenohumeral instability with the combination of a Bankart or variant lesion with a SLAP lesion [22, 23]. Recent clinical studies comparing ABR vs ABR/S report no difference between the two treatments in terms of recurrence rate [16, 23] In a prospective cohort study, Hantes et al. compared ABR vs ABR/S, reporting a single episode of recurrence for each group. The authors include athletes with different levels of competition and they do not include athletes with glenoid bone defect. Due to the time of publication, the concept of GT as a predictor of failure is not mentioned and not all athletes included had a type V SLAP lesion [16]. In a retrospective study, Aydin et al. compared 19 patients treated with ABR/S (group 1) vs. 38 treated with ABR (group 2). One patient in group 1 and two in group 2 had recurrence in the form of dislocation with no differences reported between the groups. The authors do not include patients with SGBL and do not describe the type of sport practised [14]. In a retrospective study of 58 patients divided into two groups, group C 30 ABR and group NC 28 ABR/S, Lee et al. reported no differences in recurrence rate. The authors did not include SGBL and did not mention the type of sport involved [17]. In our study, 4 (8.8%) athletes in group 1 and 5 in group 2 (11.1%) had recurrence of instability. However, there were no differences between the two groups with most of them being < 25 years old, limited-contact athletes; some were hyperlaxed and many had SGBL with on-track HSL. Studies report decreased ROM with combined repair of a Bankart lesion plus SLAP lesion [24, 25]. The cause of the stiffness could be multifactorial or perhaps associated with the location of the anchors [26]. In a cadaveric study, Itoigawa et al. compared the open Bankart repair with the open Bankart plus SLAP lesion repair. Although the authors reported no differences in terms of glenohumeral stability, patients who underwent the Bankart repair alone reported greater range of motion [26]. In a comparative clinical study between ABR vs ABR/S, Lee et al. found no difference in ROM [17]. Other studies performing the same comparison also reported no difference in ROM [14, 16, 17]. In our study, similar results were reported in ROM between preoperative and postoperative values of each group as well as between them. Probably due to a greater difficulty in ROM recovery, some studies report a slow return to the same sport level in athletes who had a combined labral repair [25, 27, 28]. This situation is particularly noticiable in overhead athletes [26]. Cho et al. reported a substantial reduction in ROM in the first weeks postoperatively in 15 patients with type V SLAP lesion managed with ABR/S, who achieved normal ROM at the end of follow-up. The authors did not evaluate return to sport [25]. Hantes et al. reported that 89% of patients in Group A and 76% in Group B returned to the same sporting level [22]. Lee et al. also reported that 90% of the patients in Group C and 85.7% in Group NC resumed their sporting activities [16]. In our study, more than 90% of the patients in both groups returned to sporting activities. Our study has limitations. First of all, it is not a randomised study. Second, 18 patients declined mainly due to cultural reasons. Third, the follow-up of our patients is too short. A longer follow-up could possibly alter the current results regarding recurrence of stability.

Conclusions

Limited-contact athletes with RASI who have a type V SLAP lesion as their primary diagnosis can be treated using either ABR or ABR/S with equal efficacy. Both treatment alternatives preserve athlete's function, stability, ROM and return to sport.

Acknowledgements We thank all our colleagues of the Orthopedics and Traumatology Service of Sanatorio Allende, Cordoba, Argentina.

Author contributions Ivan Jose Bitar, PhD. (corresponding author). Responsible for the idea, design, supervision, project management, writing, data collection, data analysis. Christian Allende Nores Ph.D. Data collection, data analysis and translation to English. Lucas Daniel Marangoni, MD. Copywriting, design, semantics and data analysis. Damian Gabriel Bustos, MD. Statistical analysis, design, and data collection and analysis. Luciano Pezzutti, MD. Statistical analysis, designs and management and analysis of variables. Lucia Belen Bitar, MD. Data collection, designs, and translation to English.

Funding The authors have not received financial payments, support or other benefits from any commercial entity related to the subject.

Data availability All data are available under reasonable request to the corresponding author.

Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

Consent to participate Written informed consent was obtained from all patients.

Consent to publish Informed consent was obtained from all individual participants included in the study.

Ethical approval This study was performed in line with the principles of the Declaration of Helsinki. The Ethics Committee of the Sanatorio Allende, Córdoba, Argentina, in common agreement has approved the conduct of the scientific study entitled: Comparison between arthroscopic Bankart repair versus arthroscopic Bankart/SLAP lesion repair in limited-contact athletes with type V SLAP lesion. A prospective cohort study.

References

1. Balg F, Boileau P (2007) The instability severity index score. A simple pre-operative score to select patients for arthroscopic or open shoulder stabilisation. J Bone Joint Surg Br 89:1470–1477. https://doi.org/10.1302/0301-620X.89B11.18962
2. Domos P, Ascione F, Wallace AL (2019) Arthroscopic Bankart repair with remplissage for non-engaging Hill-Sachs lesion in professional collision athletes. Shoulder Elbow 11:17–25. https://doi.org/10.1177/1758573217728414
3. Bitar IJ, Bustos DG, Marangoni LD, Robles C, Gentile L, Bertiche P (2023) Outcomes of open Bankart repair plus inferior capsular shift compared with latarjet procedure in contact athletes with recurrent anterior shoulder instability. Arch Bone Jt Surg 11(1):39–46. https://doi.org/10.22038/ABJS.2022.60208.2974
4. Provencher MT, Midtgaard KS, Owens BD, Tokish JM (2021) Diagnosis and management of traumatic anterior shoulder instability. J Am Acad Orthop Surg 29(e51):e61. https://doi.org/10.5435/JAAOS-D-20-00202
5. Kakazu R, MD, LeVasseur MR, Arciero RA, Mazzocca AD (2021) State of the art for treatment of bony defects around anterior shoulder instability-the American perspective. Neuester Stand der Behandlung knöcherner Defekte im Bereich der vorderen Schulterinstabilität – aus amerikanischer Sicht, 16:16–21. https://doi.org/10.1007/s11678-021-00631-2
6. Spatschil A, Landsiedl F, Anderl W et al (2006) Posttraumatic anterior-inferior instability of the shoulder: arthroscopic findings and clinical correlations. Arch Orthop Trauma Surg 126:217–222. https://doi.org/10.1007/s00402-005-0006-4
7. Kim DS, Yoon YS, Kwon SM (2010) The spectrum of lesions and clinical results of arthroscopic stabilization of acute anterior shoulder instability. Yonsei Med J 51:421–426. https://doi.org/10.3349/ymj.2010.51.3.421
8. Maffet MW, Gartsman GM, Moseley B (1995) Superior labrum-biceps tendon complex lesions of the shoulder. Am J Sports Med 23:93–98. https://doi.org/10.1177/036354659502300116
9. Gartsman GM, Roddey TS, Hammerman SM (2000) Arthroscopic treatment of anterior-inferior glenohumeral instability. Two to five-year follow-up. J Bone Joint Surg Am 82:991–1003. https://doi.org/10.2106/00004623-200007000-00011
10. Garofalo R, Mocci A, Moretti B et al (2005) Arthroscopic treatment of anterior shoulder instability using knotless suture anchors. Arthroscopy 21:1283–1289. https://doi.org/10.1016/j.arthro.2005.08.033
11. Yiannakopoulos CK, Mataragas E, Antonogiannakis E (2007) A comparison of the spectrum of intra-articular lesions in acute and chronic anterior shoulder instability. Arthroscopy 23:985–990. https://doi.org/10.1016/j.arthro.2007.05.009
12. Durban CM, Kim JK, Kim SH, Oh JH (2016) Anterior shoulder instability with concomitant superior labrum from anterior to posterior (SLAP) lesion compared to anterior instability without SLAP lesion. Clin Orthop Surg 8:168–174. https://doi.org/10.4055/cios.2016.8.2.168
13. Mihata T, McGarry MH, Tibone JE, Fitzpatrick MJ, Kinoshita M, Lee TQ (2008) Biomechanical assessment of type II superior labral anterior-posterior (SLAP) lesions associated with anterior shoulder capsular laxity as seen in throwers: a cadaveric study. Am J Sports Med 36:1604–1610. https://doi.org/10.1177/0363546508315198
14. Aydin N, Unal MB, Asansu M, Tok O (2017) Concomitant SLAP repair does not influence the surgical outcome for arthroscopic Bankart repair of traumatic shoulder dislocations. J Orthop Surg (Hong Kong) 25:1–6. https://doi.org/10.1177/2309499017718952
15 Takase K (2009) Risk of motion loss with combined Bankart and SLAP repairs. Orthopedics. https://doi.org/10.3928/01477447-20090624-05
16. Hantes ME, Venouziou AI, Liantsis AK, Dailiana ZH, Malizos KN (2009) Arthroscopic repair for chronic anterior shoulder instability: a comparative study between patients with Bankart lesions and patients with combined Bankart and superior labral anterior posterior lesions. Am J Sports Med 37:1093–1098. https://doi.org/10.1177/0363546508331139
17. Lee SH, Joo MS, Lim KH, Kim JW (2018) Arthroscopic treatment of a type II superior labrum anterior to posterior (SLAP) lesion combined with a Bankart lesion: comparative study between debridement and repair of type II SLAP lesion by the status of lesion. Clin Shoulder Elb 21:37–41. https://doi.org/10.5397/cise.2018.21.1.37
18. Jeon YS, Jeong HY, Lee DK, Rhee YG (2018) Borderline glenoid bone defect in anterior shoulder instability: latarjet procedure versus Bankart repair. Am J Sports Med 46:2170–2176. https://doi.org/10.1177/0363546518776978
19. White AE, Patel NK, Hadley CJ, Dodson CC (2019) An algorithmic approach to the management of shoulder instability. J Am Acad Orthop Surg Glob Res Rev 3(e19):00168. https://doi.org/10.5435/JAAOSGlobal-D-19-00168
20. Petrera M, Dwyer T, Tsuji MR, Theodoropoulos JS (2013) Outcomes of arthroscopic Bankart repair in collision versus noncollision athletes. Orthopedics 36:e621–e626. https://doi.org/10.3928/01477447-20130426-25
21. Yamamoto N, Kijima H, Nagamoto H et al (2015) Outcome of Bankart repair in contact versus non-contact athletes. Orthop Traumatol Surg Res 101:415–419. https://doi.org/10.1016/j.otsr.2015.03.008
22. Virk MS, Arciero RA (2013) Superior labrum anterior to posterior tears and glenohumeral instability. Instr Course Lect 62:501–514
23. Feng S, Song Y, Li H, Chen J, Chen J, Chen S (2019) Outcomes for arthroscopic repair of combined Bankart/SLAP lesions in the treatment of anterior shoulder instability: a systematic review and meta-analysis. Orthop J Sports Med 7:31. https://doi.org/10.1177/2325967119877804
24. Lo IK, Burkhart SS (2005) Triple labral lesions: pathology and surgical repair technique-report of seven cases. Arthroscopy 21:186–193. https://doi.org/10.1016/j.arthro.2004.09.022
25. Cho HL, Lee CK, Hwang TH, Suh KT, Park JW (2010) Arthroscopic repair of combined Bankart and SLAP lesions: operative techniques and clinical results. Clin Orthop Surg 2:39–46. https://doi.org/10.4055/cios.2010.2.1.39
26. Itoigawa Y, Hooke AW, Sperling JW et al (2020) Bankart repair alone in combined Bankart and superior labral anterior-posterior lesions preserves range of motion without compromising joint stability. JSES Int 21:63–67. https://doi.org/10.1016/j.jseint.2019.11.001
27. Boileau P, Parratte S, Chuinard C, Roussanne Y, Shia D, Bicknell R (2009) Arthroscopic treatment of isolated type II SLAP lesions: biceps tenodesis as an alternative to reinsertion. Am J Sports Med 37:929–936. https://doi.org/10.1177/0363546508330127
28. Kim DS, Yi CH, Yoon YS (2011) Arthroscopic repair for combined Bankart and superior labral anterior posterior lesions: a comparative study between primary and recurrent anterior dislocation in the shoulder. Int Orthop 35:1187–1195. https://doi.org/10.1007/s00264-011-1229-3