PODCAST 5-in-5

Arthroscopic Bankart Repair Versus Immobilization for a First Episode of an Anterior Shoulder Dislocation Before the Age of 25 Years

A Randomized Controlled Trial With 6-Year Follow-up

Cécile Pougès,*† MD, Marie Boutry,‡§ MD, Carlos Maynou,‡‖ PhD, Christophe Chantelot,‡‖ PhD, Thomas Vervoort,† MD, Thomas Amouyel,‡‖ MD, Clément Lalanne,† MD, and Pascal Malandri-Ghipponi,‡‖ MD
Investigation performed at the Department of Orthopedic Surgery, Roger Salengro Hospital, Lille, France

Background: The risk of recurrence after a first episode of an anterior shoulder dislocation (ASD) is high with nonoperative treatment in younger patients. In a previous study, arthroscopic labral repair (Bankart repair) reduced the risk of secondary shoulder dislocations and improved functional outcomes versus nonoperative treatment at 2-year follow-up.

Purpose/Hypothesis: The aim of this study was to compare the results of arthroscopic Bankart repair and nonoperative treatment at a minimum of 6 years' follow-up in patients aged ≤25 years. The hypothesis was that acute surgery would decrease the risk of recurrence and improve functional outcomes.

Study Design: Randomized controlled trial; Level of evidence, 1.

Methods: We included patients aged between 18 and 25 years after a first episode of an ASD and divided them into 2 groups. The first group was treated surgically with arthroscopic Bankart repair in the initial 2 weeks after the dislocation, and the second group was treated nonoperatively. Both groups were immobilized for 3 weeks in internal rotation and followed the same physical therapy protocol. Follow-up was performed at a minimum of 6 years. The primary outcome measure was the recurrence of instability, defined as another ASD requiring closed reduction or a subluxation. Secondary outcome measures included the need for stabilization surgery; return to sport; and functional outcomes according to the quick version of the Disabilities of the Arm, Shoulder and Hand (QuickDASH), Walch-Duplay score, and Western Ontario Shoulder Instability Index (WOSI).

Results: There were 20 patients included in each group. The mean age at the time of inclusion was 21.4 ± 1.8 years. A total of 37 patients were evaluated at a mean follow-up of 81.4 months (6.8 years). In the surgical group, the recurrence of instability (dislocation or subluxation) was significantly lower compared with the nonoperative group (n = 5 [27.8%] vs 17 [89.5%], respectively; $P < .0005$), and the rate increased in both groups compared with 2-year results (n = 2 [10%] vs 13 [65%], respectively; $P = .003$). Fewer patients had another episode of a dislocation in the surgical group compared with the nonoperative group (n = 4 [22.2%] vs 15 [79.0%], respectively; $P < .003$). In the surgical group, all dislocations occurred after 2 years' follow-up, while 6 patients in the nonoperative group already had dislocations at 2 years. The Walch-Duplay score (93.24 vs 76.05 points, respectively; $P = .0004$), WOSI score (12.12 vs 20.95 points, respectively; $P = .009$), and QuickDASH score (4.84 vs 16.14 points, respectively; $P = .0088$) were significantly better in the surgical group than in the nonoperative group. The rate of return to the same or better level of sport was 82% in the surgical group compared with 21% in the nonoperative group ($P < .0009$). Additionally, 11 patients (29.7%) required primary or secondary shoulder stabilization surgery: 2 (11.1%) in the surgical group and 9 (47.4%) in the nonoperative group ($P < .04$).

Conclusion: Arthroscopic labral repair (Bankart repair) reduced the risk of secondary shoulder dislocations and improved functional outcomes versus nonoperative treatment at 6-year follow-up. Surgical treatment after a first episode of a shoulder dislocation could be offered as a primary treatment option in a younger population.

The American Journal of Sports Medicine
2025;53(10):2289–2297
DOI: 10.1177/03635465251350151

Registration: NCT03315819 (ClinicalTrials.gov)

Keywords: first dislocation; shoulder; arthroscopic; Bankart repair; young

The main risk after a first episode of an anterior shoulder dislocation (ASD) is recurrence, ranging between 13% and 96% in previous studies.[17-19,31,33,36,40,42] Recurrence mainly occurs in the first 2 years after the first ASD[31] and slowly progresses to anterior shoulder instability, impeding quality of life and sport activities.[28] The younger the age of the first ASD, the higher the risk of recurrence. For Lill et al,[25] the recurrence rate at 4 years' follow-up was 85% for patients aged <30 years and 21% for patients aged >30 years. In a prospective study on 252 patients by Robinson et al,[31] the recurrence rate reached 86.6% after 5 years in patients aged 15-20 years, 73.8% in patients aged 21-25 years, and 46.8% in patients aged 26-30 years. Contact or overhead-throwing sports and higher sport levels also increase the risk of recurrence.[38]

After reducing the dislocation, the shoulder is usually immobilized in internal rotation for 3 weeks.[43] However, in the study by Taylor and Arciero,[39] in a cohort of 53 patients aged ≤24 years, 90% evolved toward instability, and half of patients aged <25 years will require secondary surgery according to Hovelius et al.[18,20] Arthroscopic labral repair (Bankart repair) has become increasingly popular with the advent of surgical anchors[29] and the incidence of rare complications.[2]

The high recurrence rate in younger patients may justify offering surgical treatment after the first episode of an ASD, but these procedures are usually only suggested after ≥1 episodes of recurrence. Previous studies[5,24,27,41] have shown promising results of arthroscopic treatment after the first episode of an ASD in younger patients, but it is not universally recognized.

We previously conducted a prospective randomized controlled trial on patients aged between 18 and 25 years after a first episode of an ASD. Patients were randomly assigned to 2 groups: the first group was treated surgically with arthroscopic Bankart repair, and the second group was treated nonoperatively with 3-week immobilization in internal rotation.[30] At 2 years of follow-up, in the surgical group, the recurrence of instability was significantly lower compared with the nonoperative group (n = 2 [10%] vs 14 [70%], respectively; $P = .0001$). Fewer patients had another episode of a dislocation (n = 0 [0%] vs 6 [30%], respectively), a subluxation (n = 2 [10%] vs 13 [65%], respectively; $P = .003$), or a positive apprehension test finding (n = 1 [5%] vs 11 [55%], respectively; $P = .0005$). The Walch-Duplay score (88.4 vs 70.3 points, respectively; $P = .046$) and Western Ontario Shoulder Instability Index (WOSI) score (11.5 vs 17.7 points, respectively; $P = .03$) were significantly better in the surgical group than in the nonoperative group. The sport level was the same or better in 89% of the surgical group versus 53% of the nonoperative group ($P = .012$).

These results were in line with other studies,[5,12,15,24,32,41] which have demonstrated the benefits of immediate arthroscopic stabilization over nonoperative treatment or arthroscopic lavage alone in young patients. However, this therapeutic approach is not the gold standard, and few studies have shown that the initial benefits persist over time. Robinson et al[31] showed that most recurrent ASDs occur within the first 2 years after the primary dislocation, but they pointed out that this risk persists into the fifth year.

It therefore seemed worthwhile to carry out a new study on these same patients at a minimum of 6 years' follow-up to ensure that the superiority of surgical treatment was maintained over time. The main objective of our study was to evaluate the long-term results of arthroscopic Bankart repair on the recurrence of ASDs versus nonoperative treatment in patients aged between 18 and 25 years after a first episode. The secondary objectives were to evaluate functional scores and return to sport in each group. We hypothesized that surgical treatment would decrease the recurrence rate, improve functional scores, and enhance return to sport at 6 years' follow-up.

METHODS

We conducted a prospective randomized controlled trial on patients aged between 18 and 25 years after a first episode of an ASD. Patients were randomly assigned to 2 groups: the first was offered arthroscopic Bankart repair, and the second was offered nonoperative treatment with 3-week immobilization in internal rotation.

The study was conducted after obtaining approval from the institutional review board (No. 2013-A01720-45). The inclusion period ranged from March 2014 to November 2016. After inclusion, follow-up was conducted at 3, 6, 12,

*Address correspondence to Cécile Pougès, MD, Clinique d'Arcachon, Avenue Jean Hameau, 33260 La Teste-de-Buch, France (email: cecilepouges@hotmail.com).

†Clinique d'Arcachon, La Teste-de-Buch, France.

‡University of Lille, Lille, France.

§Department of Orthopedic Surgery, Saint Vincent de Paul Hospital, Lille, France.

‖Department of Orthopedic Surgery, Roger Salengro Hospital, Lille, France.

Submitted February 1, 2025; accepted April 28, 2025.

The authors have declared that there are no conflicts of interest in the authorship and publication of this contribution. AOSSM checks author disclosures against the Open Payments Database (OPD). AOSSM has not conducted an independent investigation on the OPD and disclaims any liability or responsibility relating thereto.

and 24 months. The results at 2-year follow-up have been published previously.[30] For this study, we analyzed the results at a minimum of 6 years' follow-up. We obtained patients' "nonopposition" to the continuation of this study on the recommendations of our ethics committee.

Inclusion and Exclusion Criteria

Patients aged between 18 and 25 years were included in this study after a radiologically confirmed first ASD.

The exclusion criteria were as follows:

- a nontraumatic ASD in the context of joint hyperlaxity with a Beighton score $\geq$4 of 9,
- an associated humeral head fracture,
- a delay between the ASD and surgery >15 days,
- a contraindication to general anesthesia,
- pregnancy or breastfeeding,
- protected adults not able to provide consent,
- patient's refusal to comply with the follow-up protocol,
- a bone defect >25% of the glenoid surface on computed tomography (CT),[4,7] or
- a humeral avulsion of the glenohumeral ligament found during an arthroscopic examination.

Study Protocol

Closed reduction of the ASD was performed in the emergency department of a hospital. Eligible patients were offered the opportunity to participate in the study in the emergency department or during an inclusion consultation visit in the days after the ASD. The study protocol was explained to the patients (Figure 1), and written informed consent was obtained. After consent, the patient was randomized to 1 of the 2 groups by opening envelopes prepared by the clinical research department in a predetermined order. The investigators became aware of the treatment group only when the patient was included in the study.

Group 1 was the surgical treatment group. Patients underwent arthroscopic Bankart repair. Surgery was performed within 15 days after the first episode of an ASD. Immobilization in internal rotation was followed for the first 3 weeks after surgery. Physical therapy began at 3 weeks postoperatively and consisted of passive and active mobilization while limiting external rotation at 30° and abduction at 90°. Unlimited range of motion was possible after 6 weeks.

Group 2 was the nonoperative treatment group. Patients were immobilized for 3 weeks after the ASD. The physical therapy protocol was the same as in group 1.

Operative Technique

The surgical treatment of the patients in group 1 was performed under general anesthesia arthroscopically in the beach-chair position by a specialized shoulder surgeon. A posterior optical approach at the soft point and an anterior instrumental approach through the rotator interval were performed. Hemarthrosis was evacuated, and a complete

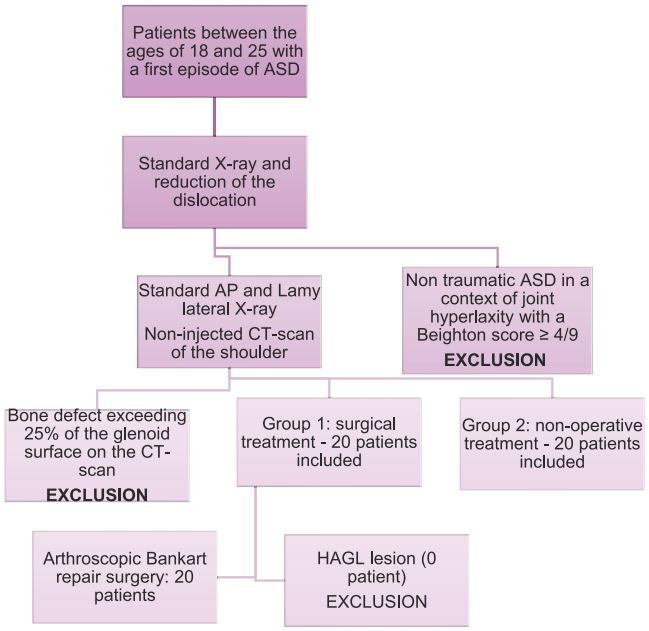

Figure 1. Study protocol. AP, anteroposterior; ASD, anterior shoulder dislocation; HAGL, humeral avulsion of the glenohumeral ligament.

assessment of bony and ligamentous injuries was performed. Humeral avulsions of the glenohumeral ligament were identified and repaired if needed. Bankart lesions were repaired with 2 to 5 arthroscopic anchors (JuggerKnot; Zimmer Biomet) inserted inferior to superior. SLAP (superior labrum anterior and posterior) lesions were repaired if found. Bony Bankart lesions involving <25% of the glenoid surface were repaired with the labrum.

Data Collection

Patients included in the study were seen during an inclusion consultation visit, at which data were collected such as laterality, associated lesions, and type and level of sport. All included patients also underwent standard anteroposterior and Lamy lateral radiography of the shoulder before and after reduction of the ASD as well as CT (without a contrast injection) of the shoulder after ASD reduction to exclude associated fractures of the humerus or glenoid defects >25% of the glenoid surface. A specialized osteoarticular radiologist reviewed all CT scans and performed the following measurements:

- Bony Bankart lesion: the theoretical area of the inferior glenoid was calculated on a 3-dimensional reconstruction according to Huysmans et al.[21] The bone defect was evaluated by subtracting the area of the avulsed fragment to the theoretical area of the glenoid.
- The risk of engagement of the humeral lesion was determined according to Di Giacomo et al.[13]
- The depth and area of the humeral defect were calculated in the axial and coronal planes according to Cho et al.[10]

Follow-up was conducted at a minimum of 6 years. We searched for evidence of recurrent instability such as

- a second episode of an ASD requiring closed reduction, the date of the first recurrent instability episode, and the number of episodes; or
- subluxation episodes characterized as painful events with a sensation of blockage or dislocations that would recede after self-reduction techniques.

Satisfaction, return to sport and sport level, and need for stabilization surgery were collected. Additionally, 3 functional measures were evaluated: the quick version of the Disabilities of the Arm, Shoulder and Hand (QuickDASH), the Walch-Duplay score, and the WOSI.

Outcome Measures

The main outcome measure was the occurrence of another episode of shoulder instability. This was defined as a dislocation or subluxation of the shoulder. Secondary outcome measures included functional scores (QuickDASH, Walch-Duplay score, and WOSI), return to sport and sport level, and need for stabilization surgery.

Statistical Analysis

In our previous study, the calculated number of patients in each group was 20, considering a 5% type I error and 20% power (type II error) with 20% lost to follow-up (PASS 2008 software, Freedman formula). Previous studies have estimated that the recurrence rate after nonoperative treatment is 35%[3,22,25,43] and 10% after operative treatment. Results were expressed as the mean ± standard deviation and median with interquartile range for continuous variables and the frequency with percentage for categorical variables.

A comparison of means according to treatment type was carried out using the Student t test when the data were considered to have a normal distribution (validated by the Shapiro-Wilk test) and the variability of the data in each group was considered to be similar (homogeneity of variance validated with the Fisher test). When these conditions were not met (normality of distribution and homogeneity of variance), the comparison of means was carried out using a nonparametric test: the Wilcoxon test. The chi-square test was applied to examine the independence of categorical variables from the type of treatment.

Statistical analysis was conducted at the 2-tailed alpha level of .05. Data were analyzed using R software (Version 3.1.6).

RESULTS

Patient Characteristics

A total of 40 patients were included from the previous study: 20 in each group. Demographic characteristics, level and type of sport, professional activities, data concerning the ASD, and radiological findings are detailed in Table 1. Both groups were comparable, and Hill-Sachs lesions were found on 100.0% of CT scans.

At 6-year follow-up, 36 patients (90%) could be evaluated: 19 in the nonoperative group and 17 in the surgical group. The mean follow-up was 81.4 months (range, 72-93 months). One additional patient in the surgical group who was lost to follow-up at 6 years but already had instability at 2 years (subluxations that required secondary stabilization surgery) was included in the analysis of main outcome measures.

Recurrent Instability, Need for Stabilization Surgery, and Complications

At 81.4 months' follow-up, 22 patients (59.5%) had another episode of shoulder instability (dislocation and/or subluxation): 17 (89.5%) in the nonoperative group and 5 (27.8%) in the surgical group; this difference was statistically significant ($P < .0005$). In the nonoperative group, 15 patients (79.0%) described complete dislocations requiring reduction versus 4 patients (22.2%) in the surgical group ($P < .003$). Figure 2 presents the cumulative incidence of recurrent instability according to treatment group.

A total of 11 patients required primary or secondary shoulder stabilization surgery: 2 (11.1%) in the surgical group and 9 (47.4%) in the nonoperative group; this difference was statistically significant ($P < .04$). Of the 9 patients in the nonoperative group, 3 patients underwent arthroscopic Bankart repair, and 6 received a coracoid bone block (Latarjet procedure); another patient was considering stabilization surgery.

In the surgical group, 2 patients needed a coracoid bone block: one had 7 recurrent episodes of an ASD; he was a competitive handball player. The second patient described, during the second year of follow-up, many episodes of subluxations and strong apprehension that led to revision surgery; he was unreachable for the present study.

In the surgical group, no perioperative or postoperative complication was noted except 1 case of adhesive capsulitis; the resolution was satisfactory with medical treatment and physical therapy at 18 months. In the nonoperative group, 1 patient developed transient brachial plexus palsy after the recurrence of a dislocation, requiring treatment and a 3-month leave from work; she recovered without sequelae.

Additionally, 12 (30.0%; 6 in each group) of the 40 included patients had an engaging "off-track" Hill-Sachs lesion on CT. The 6 patients with this lesion in the nonoperative group experienced at least one recurrence of instability compared with 2 patients in the surgical group.

Of the 5 patients in the surgical group who had a recurrence, 2 had an engaging Hill-Sachs lesion combined with a bony Bankart lesion (surface area of 3% and 5%); they both had a single recurrence of an ASD (during the third and sixth years of follow-up). The risk level of the sport practiced according to the Walch-Duplay score was high for 3 patients (basketball, handball, and basketball and rugby), medium for 1 patient (English boxing and boby-building), and limited for 1 patient (judo and football).

TABLE 1
Patient and Injury Characteristics[a]

	Nonoperative (n = 20)	Surgical (n = 20)	*P* Value
Sex, male/female	18/2	15/5	.41
Age, y			.63
Mean	21.3	21.5	
Median (IQR)	21.5 (20.0-22.5)	22.0 (20.5-22.5)	
Body mass index, kg/m^2			.68
Mean	23.3	24.0	
Median (IQR)	22.2 (20.5-25.5)	22.7 (20.9-25.3)	
Dominant arm, right/left	16/4	17/3	>.99
Injured arm, dominant/nondominant	8/12	9/11	.71
Employment status			.73
Unemployed/student	15 (75)	13 (65)	
Sedentary occupation	0 (0)	2 (10)	
Light manual labor	4 (20)	3 (15)	
Heavy manual labor	1 (5)	2 (10)	
Work injury	3 (15)	3 (15)	NA
Associated lesions			NA
None	18 (90)	19 (95)	
Leg fracture	0 (0)	1 (5)	
Scapular fracture	2 (10)	0 (0)	
Hill-Sachs lesion			NA
Engaging (off-track)	6 (30)	6 (30)	
Nonengaging (on-track)	14 (70)	14 (70)	
Diagnosed on CT	20 (100)	20 (100)	
Bony Bankart lesion	1 (5)	4 (20)	NA
Level of participation in sport			.32
None	2 (10)	5 (25)	
Recreational	14 (70)	9 (45)	
Competitive	4 (20)	6 (30)	
Risk level of sport according to Walch-Duplay score			NA
No sport	2 (10)	5 (25)	
Without risk	1 (5)	1 (5)	
Limited risk	9 (45)	2 (10)	
Medium risk	8 (40)	5 (25)	
High risk	0 (0)	7 (35)	

[a]Data are expressed as No. or n (%) unless otherwise specified. CT, computed tomography; IQR, interquartile range; NA, not applicable.

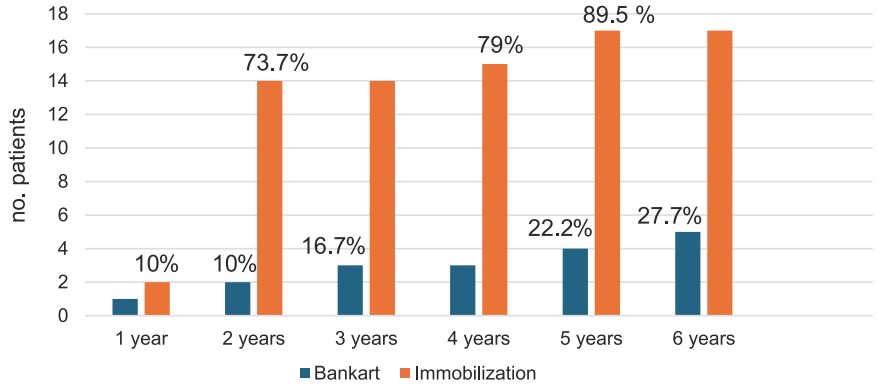

Figure 2. Cumulative incidence of recurrent instability (dislocation and subluxation) in both groups.

Functional Scores

At 6-year follow-up, the WOSI, Walch-Duplay, and Quick-DASH scores were significantly better in the surgical group (Table 2). The scores in each domain of the Walch-Duplay score were superior in the surgical group; only the difference in domain A (sport or activities of daily living) was not statistically significant (P = .07).

TABLE 2
Functional Scores at 6 Years[a]

	Surgical	Nonoperative	Difference	*P* Value
QuickDASH	4.84 ± 2.03 (0-47.73)	16.14 ± 5.97 (0-45.45)	11.30	.0088
WOSI	12.12 ± 3.32 (0-69)	20.95 ± 15.89 (0-57)	8.83	.009
Walch-Duplay score	93.24 ± 7.23 (55-100)	76.05 ± 18.45 (30-100)	17.19	.0004
A: sport or activity	23.82 ± 13.10 (15-25)	20.00 ± 4.45 (0-25)	3.82	.07
B: stability	22.65 ± 3.32 (15-25)	15.53 ± 5.50 (0-25)	7.12	.0001
C: mobility	22.94 ± 4.37 (10-25)	19.21 ± 5.07 (15-25)	3.73	.014
D: pain	23.82 ± 4.70 (15-25)	20.79 ± 5.84 (10-25)	3.03	.04

[a]Data are expressed as mean ± SD (range). QuickDASH, quick version of the Disabilities of the Arm, Shoulder and Hand; WOSI, Western Ontario Shoulder Instability Index.

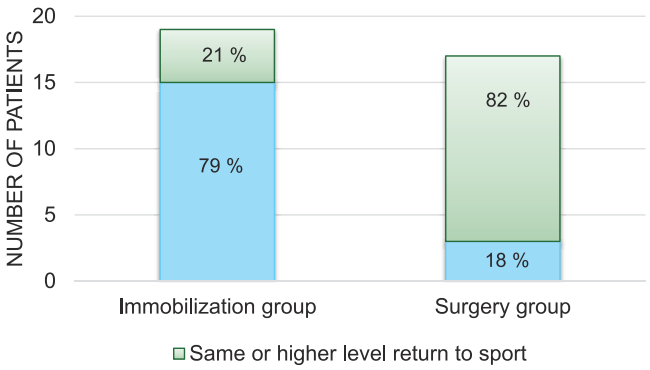

Figure 3. Level of return to sport in both groups. The top number is return to the same or higher level sport, bottom number is lower level return to sport.

Return to Sport

All patients analyzed at follow-up had returned to sport. The level of sport was the same or better in 82% of the surgical group versus only 21% in the nonoperative group ($P < .0009$) (Figure 3).

DISCUSSION

This study shows that arthroscopic Bankart repair after the first episode of an ASD significantly reduced the risk of recurrent instability in patients aged ≤25 years compared with immobilization at 6-year follow-up. These patients also had better functional scores and a higher level of sport and did not have more complications. These results are in favor of surgical treatment.

The study's design was methodologically robust with strong oversight from the institutional review board. The calculation of the number of patients in each group accounted for 8 patients lost to follow-up to reach 80% statistical power with a 5% type I error. Despite a younger and therefore more mobile study population, only 4 patients were lost to follow-up in our study. One of the 3 patients lost to follow-up from the surgical group needed the Latarjet procedure in the second year and was included in the analyses for recurrent instability and the need for stabilization surgery. Most patients chose teleconsultations (32/36 [88.9%]), with the main reason being geographical distance, as the study targeted a young and active population.

In the surgical group, 5 patients (27.8%) experienced a recurrence of instability. Among them, 4 had a recurrence of an ASD, with 2 after severe trauma (a car accident and a rugby tackle) without a second recurrence since. The other 2 had recurrences due to vulnerable movements; one of these 2 patients required further surgery (Latarjet procedure). The fifth patient had subluxations that required secondary stabilization surgery (Latarjet procedure) in the second year. There was only 1 complication in this group, which was adhesive capsulitis treated medically. In the nonoperative group, 1 patient experienced transient brachial plexus palsy after a recurrent dislocation, resulting in work stoppage, cessation of sport activities, and 3 months of immobilization, along with several rehabilitation sessions.

Our results are in line with other studies; the recurrence rate in the surgical group was 27.8%. Yapp et al[44] reported a 12% failure rate at more than 10 years of follow-up, comparing arthroscopic lavage to capsulolabral reinsertion after an initial dislocation. However, patients younger than 35 years were included, compared with those aged ≤25 years in our study, and we know that younger age is the main risk factor for recurrence.[19,37] Chapus et al[9] reported a 35% failure rate (25% recurrent dislocations and 10% subluxations) in a prospective study of patients aged 15 to 25 years who underwent anterior capsulolabral reinsertion after a first episode of an ASD at 10 years' follow-up. De Carli et al[12] found a 13% recurrence rate in the surgical group at over 5 years of follow-up, comparing early arthroscopic Bankart repair versus immobilization in patients aged 15 to 25 years, but the main outcome measure was only dislocations. Additionally, 2 patients (11.1%) in the surgical group underwent secondary surgery; this rate was 9% in Yapp et al's[44] study and 6.7% in De Carli et al's[12] study.

In the nonoperative group, 89.5% of patients had recurrent instability compared with 27.8% in the surgical group. In this group, 9 patients (47.4%) required shoulder stabilization surgery: 3 patients underwent arthroscopic

TABLE 3
Studies Comparing Arthroscopic Surgery to Nonoperative Treatment After Initial ASD[a]

Author (Year)	Study Design	Treatment	Age, y	Main Outcome Measures	No. of Cases (Surgery/ Immobilization)	Follow-up, mo	Rates of Main Outcome Measures
Arciero et al[3] (1994)	Prospective, nonrandomized	Bankart vs immobilization	Young athletes	Dislocation, subluxation, apprehension	21/15	32	Surgery: 14% Immobilization: 80%
Bottoni et al[5] (2002)	RCT	Bankart vs immobilization	18-26	Dislocation, subluxation, instability	10/14	36	Surgery: 11% Immobilization: 75%
Kirkley et al[24] (2005)	RCT	Bankart vs immobilization	≤30	Dislocation	16/15	75	Surgery: 19% Immobilization: 60%
Chapus et al[9] (2015)	Prospective, noncontrolled	Bankart	15-25	Dislocation, subluxation	20	116.4	Surgery: 35%
De Carli et al[12] (2019)	Nonrandomized	Bankart vs immobilization	15-25	Dislocation	60/70	82.3	Surgery: 13.3% Immobilization: 71.4%
Gigis et al[15] (2014)	Prospective, nonrandomized	Bankart vs immobilization	15-18	Dislocation, subluxation, apprehension	24/17	36	Surgery: 13.1% Immobilization: 70.3%
Current study	RCT	Bankart vs immobilization	18-25	Dislocation, subluxation	18/19	81.4	Surgery: 27.8% Immobilization: 89.5%

[a]ASD, anterior shoulder dislocation; RCT, randomized controlled trial.

Bankart repair, and 6 received a coracoid bone block (Latarjet procedure). De Carli et al[12] reported a similar 45.7% rate for patients in the nonoperative group who required surgical stabilization.

Table 3 summarizes the different studies with more than 2 years' follow-up that have compared arthroscopic capsulolabral reinsertion with immobilization after a first ASD.

We observed that 68% of recurrent dislocations occurred after the second year of follow-up, whereas in the literature, most occurred before this time, with 86% within 2 years according to Robinson et al.[31] We cannot explain this difference, but this suggests that a follow-up of more than 2 years is desirable for studies on this subject.

Other studies have shown better results with arthroscopic repair versus arthroscopic lavage. Robinson et al's[32] study of 88 patients younger than 35 years at 2-year follow-up showed an 82% reduction in the risk of recurrence and better functional scores. These patients were reassessed after a minimum of 10 years postoperatively, and the study demonstrated a long-term benefit in overall shoulder stability and WOSI scores for arthroscopic Bankart repair.[44] In Chahal et al's[8] meta-analysis, arthroscopic repair was superior to lavage and nonoperative treatment in 228 patients at 2-year follow-up.

At 2 years of follow-up in our previous study, surgical treatment seemed to make return to sport easier: 95% of patients in the surgical group had returned to sport; among them, 89% returned to their previous level or better, whereas only 53% did in the nonoperative group.

At 6 years, our results were maintained: the rate of return to sport at the same or higher level was 82% in the surgical group and 21% in the nonoperative group. These results are comparable with data in the literature; in a series of young athletes, Cordasco et al[11] reported a return-to-sport rate of 88% after Bankart repair. Patients were prospectively included, with no more than 3 episodes of an ASD, and the minimum follow-up was 2 years. In a systematic review, Kasik et al[23] found a return-to-sport rate of 81.5%. Gerometta et al[14] reported a rate of return to sport at the same or higher level of 23% in top-level rugby players treated nonsurgically, and the rate was 41% in De Carli et al's[12] study for the immobilization group versus 88.6% for the surgical group.

In our study, all functional scores were superior in the surgical group. These differences were statistically significant for the WOSI, Walch-Duplay, and QuickDASH scores. De Carli et al[12] and Yapp et al[44] also found significantly higher scores in the surgical group.

A recurrence rate of 27.8% (5/18) in the surgical group can be considered quite high. However, our study was carried out on young patients (mean age, 21.5 years), and the follow-up period was longer than average. The fact that 4 patients in the surgical group had a bony Bankart lesion may have contributed to this high rate. Although these lesions were small, 2 of these patients, who concomitantly had an engaging Hill-Sachs lesion, had recurrences. Despite this high recurrence rate, functional results were much better in the surgical group, but this leads one to consider adding Hill-Sachs remplissage to the procedure.

Given the number of patients, we were unable to demonstrate with statistical reliability which elements (type of sport, radiological lesions) might increase the risk of failure after surgery. A larger randomized study with the same type of patients, comparing arthroscopic Bankart repair versus arthroscopic Bankart repair and Hill-Sachs remplissage, could be useful in determining the best treatment option according to patient characteristics.

To date, there is no consensus on the optimal management of a first episode of an ASD in a young patient. Although many studies comparing surgical treatment

and immobilization have shown the superiority of surgery, nonoperative treatment is commonly preferred. However, this is associated with a particularly high recurrence rate of 89.5%. Our results are in favor of surgical management after the first episode of an ASD in patients aged ≤25 years. Opponents of surgery after a first dislocation may argue that many patients would be operated on unnecessarily and that surgery can still be proposed after several recurrences. However, in our nonoperative group, while 47.4% underwent stabilization surgery, the negative effect of instability on quality of life was significant, with poorer functional scores and a lower level of return to sport for 79% of patients.

Some studies have shown that early repair of a labral lesion increases the chances of healing compared with repair of chronic lesions.[16,41] According to Marshall et al,[26] the risk of revision surgery after Bankart repair is 6 times higher if surgery is performed after several dislocations than if it is performed immediately (odds ratio, 6.01). Rugg et al[34] showed that patients operated on after several dislocations have a greater risk of glenoid bone loss or biceps tendon abnormalities (odds ratio, 6.27; $P < .013$).

Some authors have found a correlation between the number of dislocations and the development of glenohumeral osteoarthritis.[6] In a retrospective study at 13 years after arthroscopic Bankart repair, Aboalata et al[1] found better clinical results in patients operated on from the first dislocation and less radiological glenohumeral osteoarthritis in this group. In contrast, in Samilson and Prieto's[35] series of 74 arthritic shoulders in patients with ≥1 dislocations, the authors found no correlation between the number of dislocations and the severity of osteoarthritis. In the 10-year epidemiological study by Hovelius et al,[18] the authors reported an 11% rate of early glenohumeral osteoarthritis and a 9% rate of moderate to severe osteoarthritis in young patients with ≥1 episodes of an ASD. It would be interesting to continue to follow these patients to compare the risk of secondary osteoarthritis in each group.

CONCLUSION

Arthroscopic Bankart repair reduced the risk of recurrent instability and improved outcomes with better functional scores and return to sport versus nonoperative treatment at a mean follow-up of 81.4 months. Our results align with other studies suggesting that capsulolabral reinsertion after a first episode of a shoulder dislocation could be offered as a primary treatment option in a younger population. This study further validates what was found at 2 years' follow-up of the same patients.

ORCID iDs

Cécile Pougès https://orcid.org/0000-0002-2358-2774
Thomas Amouyel https://orcid.org/0000-0003-2038-6943

REFERENCES

1. Aboalata M, Plath JE, Seppel G, Juretzko J, Vogt S, Imhoff AB. Results of arthroscopic Bankart repair for anterior-inferior shoulder instability at 13-year follow-up. *Am J Sports Med*. 2017;45(4):782-787.
2. Ahmed I, Ashton F, Robinson CM. Arthroscopic Bankart repair and capsular shift for recurrent anterior shoulder instability. *J Bone Joint Surg Am*. 2012;94(14):1308-1315.
3. Arciero RA, Wheeler JH, Ryan JB, McBride JT. Arthroscopic Bankart repair versus nonoperative treatment for acute, initial anterior shoulder dislocations. *Am J Sports Med*. 1994;22(5):589-594.
4. Boileau P, Villalba M, Héry J-Y, Balg F, Ahrens P, Neyton L. Risk factors for recurrence of shoulder instability after arthroscopic Bankart repair. *J Bone Joint Surg Am*. 2006;88(8):1755-1763.
5. Bottoni CR, Wilckens JH, DeBerardino TM, et al. A prospective, randomized evaluation of arthroscopic stabilization versus nonoperative treatment in patients with acute, traumatic, first-time shoulder dislocations. *Am J Sports Med*. 2002;30(4):576-580.
6. Brophy RH, Marx RG. Osteoarthritis following shoulder instability. *Clin Sports Med*. 2005;24(1):47-56.
7. Burkhart SS, De Beer JF. Traumatic glenohumeral bone defects and their relationship to failure of arthroscopic Bankart repairs. *Arthroscopy*. 2000;16(7):677-694.
8. Chahal J, Marks PH, Macdonald PB, et al. Anatomic Bankart repair compared with nonoperative treatment and/or arthroscopic lavage for first-time traumatic shoulder dislocation. *Arthroscopy*. 2012;28(4):565-575.
9. Chapus V, Rochcongar G, Pineau V, Salle de Chou É, Hulet C. Ten-year follow-up of acute arthroscopic Bankart repair for initial anterior shoulder dislocation in young patients. *Orthop Traumatol Surg Res*. 2015;101(8):889-893.
10. Cho SH, Cho NS, Rhee YG. Preoperative analysis of the Hill-Sachs lesion in anterior shoulder instability: how to predict engagement of the lesion. *Am J Sports Med*. 2011;39(11):2389-2395.
11. Cordasco FA, Lin B, Heller M, Asaro LA, Ling D, Calcei JG. Arthroscopic shoulder stabilization in the young athlete: return to sport and revision stabilization rates. *J Shoulder Elbow Surg*. 2020;29(5):946-953.
12. De Carli A, Vadalà AP, Lanzetti R, et al. Early surgical treatment of first-time anterior glenohumeral dislocation in a young, active population is superior to conservative management at long-term follow-up. *Int Orthop*. 2019;43(12):2799-2805.
13. Di Giacomo G, Itoi E, Burkhart SS. Evolving concept of bipolar bone loss and the Hill-Sachs lesion: from ''engaging/non-engaging'' lesion to ''on-track/off-track'' lesion. *Arthroscopy*. 2014;30(1):90-98.
14. Gerometta A, Klouche S, Herman S, Lefevre N, Bohu Y. Faut-il stabiliser chirurgicalement l'épaule du sportif dès le premier épisode d'instabilité? Étude comparée versus traitement conservateur chez 138 joueurs de rugby. *Rev Chir Orthop Traumatol*. 2016;102(8):S283-S284.
15. Gigis I, Heikenfeld R, Kapinas A, Listringhaus R, Godolias G. Arthroscopic versus conservative treatment of first anterior dislocation of the shoulder in adolescents. *J Pediatr Orthop*. 2014;34(4):421-425.
16. Gutierrez V, Monckeberg JE, Pinedo M, Radice F. Arthroscopically determined degree of injury after shoulder dislocation relates to recurrence rate. *Clin Orthop Relat Res*. 2012;470(4):961-964.
17. Henry JH, Genung JA. Natural history of glenohumeral dislocation: revisited. *Am J Sports Med*. 1982;10(3):135-137.
18. Hovelius L, Augustini BG, Fredin H, Johansson O, Norlin R, Thorling J. Primary anterior dislocation of the shoulder in young patients: a ten-year prospective study. *J Bone Joint Surg Am*. 1996;78(11):1677-1684.
19. Hovelius L, Olofsson A, Sandström B, et al. Nonoperative treatment of primary anterior shoulder dislocation in patients forty years of age and younger: a prospective twenty-five-year follow-up. *J Bone Joint Surg Am*. 2008;90(5):945-952.
20. Hovelius L, Rahme H. Primary anterior dislocation of the shoulder: long-term prognosis at the age of 40 years or younger. *Knee Surg Sports Traumatol Arthrosc*. 2016;24(2):330-342.

21. Huysmans PE, Haen PS, Kidd M, Dhert WJ, Willems JW. The shape of the inferior part of the glenoid: a cadaveric study. *J Shoulder Elbow Surg*. 2006;15(6):759-763.
22. Itoi E, Hatakeyama Y, Sato T, et al. Immobilization in external rotation after shoulder dislocation reduces the risk of recurrence: a randomized controlled trial. *J Bone Joint Surg Am*. 2007;89(10):2124-2131.
23. Kasik CS, Rosen MR, Saper MG, Zondervan RL. High rate of return to sport in adolescent athletes following anterior shoulder stabilisation: a systematic review. *J ISAKOS*. 2019;4(1):33-40.
24. Kirkley A, Werstine R, Ratjek A, Griffin S. Prospective randomized clinical trial comparing the effectiveness of immediate arthroscopic stabilization versus immobilization and rehabilitation in first traumatic anterior dislocations of the shoulder: long-term evaluation. *Arthroscopy*. 2005;21(1):55-63.
25. Lill H, Verheyden P, Korner J, Hepp P, Josten C. Conservative treatment after first traumatic shoulder dislocation. *Chirurg*. 1998;69(11):1230-1237.
26. Marshall T, Vega J, Siqueira M, Cagle R, Gelber JD, Saluan P. Outcomes after arthroscopic Bankart repair: patients with first-time versus recurrent dislocations. *Am J Sports Med*. 2017;45(8):1776-1782.
27. Owens BD, DeBerardino TM, Nelson BJ, et al. Long-term follow-up of acute arthroscopic Bankart repair for initial anterior shoulder dislocations in young athletes. *Am J Sports Med*. 2009;37(4):669-673.
28. Owens BD, Duffey ML, Nelson BJ, DeBerardino TM, Taylor DC, Mountcastle SB. The incidence and characteristics of shoulder instability at the United States Military Academy. *Am J Sports Med*. 2007;35(7):1168-1173.
29. Petrera M, Patella V, Patella S, Theodoropoulos J. A meta-analysis of open versus arthroscopic Bankart repair using suture anchors. *Knee Surg Sports Traumatol Arthrosc*. 2010;18(12):1742-1747.
30. Pougès C, Hardy A, Vervoort T, et al. Arthroscopic Bankart repair versus immobilization for first episode of anterior shoulder dislocation before the age of 25: a randomized controlled trial. *Am J Sports Med*. 2021;49(5):1166-1174.
31. Robinson CM, Howes J, Murdoch H, Will E, Graham C. Functional outcome and risk of recurrent instability after primary traumatic anterior shoulder dislocation in young patients. *J Bone Joint Surg Am*. 2006;88(11):2326-2336.
32. Robinson CM, Jenkins PJ, White TO, Ker A, Will E. Primary arthroscopic stabilization for a first-time anterior dislocation of the shoulder: a randomized, double-blind trial. *J Bone Joint Surg Am*. 2008;90(4):708-721.
33. Rowe CR, Sakellarides HT. Factors related to recurrences of anterior dislocations of the shoulder. *Clin Orthop*. 1961;20:40-48.
34. Rugg CM, Hettrich CM, Ortiz S, et al. Surgical stabilization for first-time shoulder dislocators: a multicenter analysis. *J Shoulder Elbow Surg*. 2018;27(4):674-685.
35. Samilson RL, Prieto V. Dislocation arthropathy of the shoulder. *J Bone Joint Surg Am*. 1983;65(4):456-460.
36. Saragaglia D, Picard F, Le Bredonchel T, Moncenis C, Sardo M, Tourne Y. Acute anterior instability of the shoulder: short- and mid-term outcome after conservative treatment. *Rev Chir Orthop Reparatrice Appar Mot*. 2001;87(3):215-220.
37. Shields DW, Jefferies JG, Brooksbank AJ, Millar N, Jenkins PJ. Epidemiology of glenohumeral dislocation and subsequent instability in an urban population. *J Shoulder Elbow Surg*. 2018;27(2):189-195.
38. Simonet WT, Cofield RH. Prognosis in anterior shoulder dislocation. *Am J Sports Med*. 1984;12(1):19-24.
39. Taylor DC, Arciero RA. Pathologic changes associated with shoulder dislocations: arthroscopic and physical examination findings in first-time, traumatic anterior dislocations. *Am J Sports Med*. 1997;25(3):306-311.
40. te Slaa RL, Brand R, Marti RK. A prospective arthroscopic study of acute first-time anterior shoulder dislocation in the young: a five-year follow-up study. *J Shoulder Elbow Surg*. 2003;12(6):529-534.
41. Uhring J, Rey P-B, Rochet S, Obert L. Interest of emergency arthroscopic stabilization in primary shoulder dislocation in young athletes. *Orthop Traumatol Surg Res*. 2014;100(8 Suppl):S401-S408.
42. Wheeler JH, Ryan JB, Arciero RA, Molinari RN. Arthroscopic versus nonoperative treatment of acute shoulder dislocations in young athletes. *Arthroscopy*. 1989;5(3):213-217.
43. Whelan DB, Kletke SN, Schemitsch G, Chahal J. Immobilization in external rotation versus internal rotation after primary anterior shoulder dislocation: a meta-analysis of randomized controlled trials. *Am J Sports Med*. 2016;44(2):521-532.
44. Yapp LZ, Nicholson JA, Robinson CM. Primary arthroscopic stabilization for a first-time anterior dislocation of the shoulder: long-term follow-up of a randomized, double-blinded trial. *J Bone Joint Surg*. 2020;102(6):460-467.