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Recurrence and return to sport after surgery for shoulder instability: arthroscopic Bankart versus Latarjet procedure

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Background: Surgeons differ in their preferences concerning the best surgical technique for treating shoulder instability in sportspeople. The purpose was to evaluate the risk of recurrence and the likelihood of return to sport for the 2 principal shoulder stabilization techniques used to treat shoulder instability in sportspeople.

Methods: We screened sportspeople who had undergone shoulder stabilization for inclusion in this cohort study. For eligibility, patients had to have undergone surgery by one of the 2 techniques: Latarjet or arthroscopic Bankart between 2005 and 2011, and aged from 18 to 35 years. We excluded acromioclavicular dislocation, tendinous lesion, global or posterior instability, bone fracture or severe glenoid bone loss, neurological lesion, other surgical technique, and orthopedic treatment. Patients were contacted by telephone between 2009 and 2012 and asked to participate in follow-up after surgery. The primary endpoint was recurrence, evaluated by determining frequency and time to recurrence (or censoring) with Cox models. The secondary endpoint was the return to sport (training and competition).

Results: Follow-up telephone interviews were conducted with 120 sportspeople (response rate of 61.5%), one of whom was excluded due to the occurrence of a new contralateral dislocation before returning to sport after surgery (Latarjet $n = 80$, Bankart $n = 39$). The risk of recurrence was significantly higher ($P < .001$) for Bankart ($n = 7$, 17.9%) than for Latarjet ($n = 2$, 2.5%) interventions. Being under the age of 20 years was a significant risk factor for recurrence ($P = .007$). Return to sport was significantly more frequent among sportspeople undergoing Latarjet procedures, for both training ($P = .031$) and competition ($P = .038$), and was also significantly more rapid for training ($P = .034$) with a mean time to return to training of 5.1 months for Latarjet procedures, versus 6.4 months for Bankart procedures.

Conclusion: The Latarjet surgical technique results in fewer recurrences than the Bankart technique, with a higher rate of return to sport (training, competition) and a faster return to training for sportspeople practicing potentially risky sports in competition. Age was also identified as an additional risk factor for recurrence. It is important to take these factors into account when considering the indications for surgery.

Shoulder instability is a frequent condition, with an incidence in the general population of 1.7%, with most cases resulting from participation in sports.[9] Within the collegiate athlete population, glenohumeral instability has an incidence as high as 0.12 per 1000 athlete exposures. Its frequency is even higher in collision and contact sports, such as football and wrestling.[30]

It has been shown that 72% of French shoulder surgeons prefer open Latarjet bone block procedures for treating traumatic recurrent anterior shoulder instability, whereas a large international survey found that 90% of shoulder surgeons in other countries preferred arthroscopic Bankart repair.[32] These findings reveal major differences in viewpoint between French- and English-speaking countries. Published recurrence rates for these 2 techniques vary considerably, from 0% to 30% for arthroscopic Bankart repair,[13,22] and from 2% to 14% for the open Latarjet bone block procedure (with 2 screws and the block lying down),[2,10,12,15] but few comparative studies have considered recurrence rates.[4,6,20]

Some risk factors for recurrence (age, sex, type of sport, sporting level, joint mobility, and radiological criteria) have been described (ISI score[3]). They play a role in the risk of recurrence after Bankart surgery and some surgeons use them to determine the indications for surgery. There is considerable variation in the risk of recurrence,

This cohort study was conducted according to the WMA Declaration of Helsinki. The study was approved by an appropriate scientific ethics committee (IRB N. COS-RGDS-2019-10-002).

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as a function of sporting activity in particular. Very few cases series have been published for shoulder stabilization surgery in sportspeople, and only a few of those available have compared block-based techniques with Bankart interventions.[4,7,26,29] Our experience with sportspeople has shown that the most important aspect of surgical outcome is the capacity of these patients to resume their sporting activities (rate of return to sport, time to return to sport, and surgical efficacy, as assessed by the absence of recurrence). We, therefore, sought to identify the factors associated with recurrence, and those associated with a return to sport more precisely for these 2 surgical techniques. The researchers hypothesized that risk of recurrence is higher with Bankart than Latarjet, with a lower rapidity to return to sport.

Materials and methods

Athletes experiencing shoulder injuries between 2005 and 2011 were screened for participation in this cohort study. We first entered data from the screened population into a computerized database including complete surgical, medical, and sports-related data, and informed the patients of the study. Patients were considered eligible for the study if they were aged from 18 to 35 years, and had undergone one of 2 types of surgical intervention for shoulder instability: Bankart or Latarjet interventions. Patients diagnosed with a condition other than glenohumeral instability or receiving another treatment were not included. All the surgical techniques were checked before inclusion. Latarjet procedures were defined by the presence of a coracoid bone block with open surgery, and Bankart procedures were defined by arthroscopic capsular repair without the use of a coracoid bone block. We excluded acromioclavicular dislocation, tendinous lesion, global or posterior instability, bone fracture or severe glenoid bone loss, neurological lesion, other surgical technique, orthopedic treatment, and dislocation of the contralateral shoulder since the surgery.

Rehabilitation was based first on postoperative recovery for articular mobility. In second time, progression of musculation rehabilitation exercises was introduced from 3 weeks to 3 months after surgery.[34] A brace was worn for 3 to 6 weeks, as decided by the surgeon. Cardiovascular activity on a bicycle, step machine, or rowing machine was introduced progressively. Swimming (crawl) was also introduced after this period. A return to running was introduced around the 6 or 8 weeks in function of evolution. Return to the original activity was subject to the surgeon's approval.

Eligible participants were sportspeople, and we analyzed sporting disciplines and grouped them together according to a classification (Table I) based on the level of risk,[18] and whether the sport involves arm rotation or physical contact. For patients playing in competition, sporting level was classified as regional, national, or international. Players not involved in competition were classified as recreational athletes, this category including sports teachers, coaches, and monitors, because they play in recreational time, not in level of competition.

Once the eligibility criteria had been checked, the patients included were contacted by telephone, between 2009 and 2012, by the same person. If no response was obtained at the first attempt, no further contact was made. Patients who did not answer the call were considered to be lost to follow-up. Data regarding repeat or contralateral ruptures, return to sport (training, competition), and the time to each of these events were recorded.

All those contacted gave consent for the use of data from their hospital records, established during their hospital stay. The study (ID RCB: 2019-A01968-49) was approved by an appropriate scientific ethics committee (Paris, IRB N. COS-RGDS-2019-10-002).

Statistical analyses

We performed an observational cohort study. All calculations were performed with SAS for Windows (v 9.4; SAS Institute Inc., Cary, NC, USA), considering values of $P < .05$ to be statistically significant. Descriptive data analysis was performed according to the nature of the criteria considered. For quantitative data, this analysis included the number of observed values (and of missing data, if any), the mean, standard deviation (SD), and range. For qualitative data, the analysis included the number of observed values (and of missing data, if any) and the number and percentage of patients per class. Depending on the nature of the endpoints considered, we used Cox models or analysis of covariance to identify risk or explanatory factors associated with the outcome of interest. We compared patient characteristics between groups defined on the basis of type of surgery (Bankart or Latarjet), in chi-squared or Fisher's exact tests for qualitative data, and Student's t tests for quantitative data, after verification of Gaussian distribution. The characteristics of the patients were taken into account in the multivariate analyses, after adjustment for age, sex, sport, and sporting level, for comparisons between groups, to obtain reliable statistics.

Results

Patient characteristics

We screened a total of 615 athletes with shoulder injuries between 2005 and 2011 (Fig. 1), 420 of whom were not included in the study because they did not meet the inclusion criteria. Ultimately 195 patients were eligible for inclusion, and attempts were made to contact these individuals by telephone during the period 2009 to 2012. In total, 120 (61.5%) of these patients answered the telephone call, and all agreed to participate in the follow-up study and to answer the questions. There was no statistical difference between the population who have responded and not. One of these patients (0.8%) had experienced a dislocation of the contralateral shoulder since surgery. The data for this patient were therefore excluded from subsequent analyses ($N = 119$).

The questionnaire was completed by all the study subjects, a mean (±SD) of 25.8 ± 9.6 months (range: 12-56 months) after coracoid block interventions and 28.4 ± 10.0 months (14-48 months) after arthroscopic Bankart interventions by 16 different surgeons (Table II). This difference between groups in the time at which the questionnaires were completed was not significant. We therefore analyzed the responses obtained from 119 sportspeople concerning the 2 types of surgery: 67% ($N = 80$) for Latarjet, and 33% ($N = 39$) for Bankart (Table II), without difference in the time between the first luxation and the surgery. The mean age of the patients was 23.3 ± 3.8 years. The most common sport practiced was rugby ($n = 67$, 56.3%), followed by soccer, handball, judo, and skiing (Table II).

The male/female distribution and the distribution of types of sports (Table II) were similar for the 2 types of surgery. By contrast, significant differences were found between the 2 types of surgery in terms of patient age and sporting level. The patients who underwent Latarjet interventions were younger and had a higher sporting level, consistent with the reported preference of surgeons for this technique for young elite sportspeople (ISI score[3]). These different characteristics were taken into account in adjusted multivariate analyses, to compare the different groups.

Table I
Classification of dislocation risk level, by sport, according to Huget.[18]

Grade	Risk level	Classification	Sports
1	No risk	No risk	Rowing, archery
2	Risk of falls, collisions, without arm rotation	Contact/impact	Football, motorcycle racing, BMX racing, skiing, rugby, snowboarding, surfing, bodyboarding
3	Sport involves arm rotation with no risk of falls or impact	Sport involves arm rotation	Climbing, canoeing, swimming, pelote, tennis
4	Sport involves arm rotation + risk of falls or impact		Boxing, windsurfing, basketball, handball, ice hockey, judo, American football

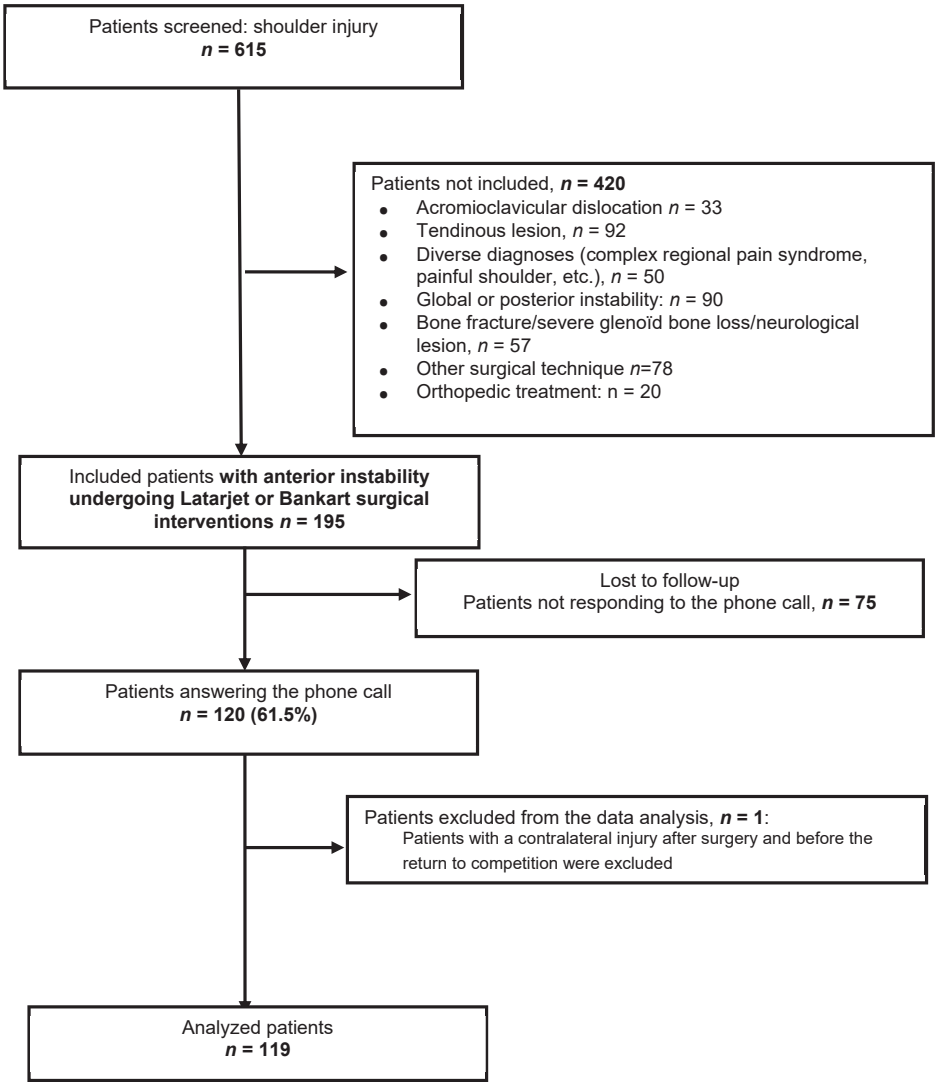

Figure 1 Flowchart summarizing the study design.

Influence of type of surgery on the recurrence and return to sport outcomes

Nine recurrences (7.6% of patients) were reported in the 2 groups: 2.5% ($N = 2$) for the Latarjet group, 17.9% ($N = 7$) for the Bankart group (Tables II and III). The mean time to recurrence was 12.5 months (±9.2) for the Latarjet group, and 14.4 months (±9.1) for the Bankart group (Table IV). Cox modeling showed the risk of recurrence to be significantly higher for the Bankart group than for the Latarjet group, after adjustment for age, sex, type and level of sport, with a corresponding adjusted hazard ratio (HR) of 12.404 (95% confidence interval [CI] = [2.7; 97.605], $P < 0,01$; Table V).

For age considered as a categorical variable (≤ 20 years and > 20 years), the adjusted HR was 14.259 (95% CI = [2.539; 112.529]), indicating a significant impact of age group on the likelihood of recurrence, with worse outcomes for individuals aged under 20 years ($P = .007$) after adjustment for other potentially relevant variables (Table V).

Sex, level, and type of sport were not significantly associated with recurrence after adjustment for other relevant variables (Table V).

Table II
Characteristics (sex, age, sport, sporting level, surgery) for the total population analyzed (80 sportspeople undergoing Latarjet interventions, and 39 undergoing Bankart interventions = 119), and for the population of patients presenting recurrences (9).

Variable	Total	Patients with recurrences	Latarjet	Bankart	*P* value (Latarjet vs. Bankart)
Number					
n (difference of means)	119	9	80	39	
Sex					
M	108 (90.8%)	9 (100.0%)	73 (91.3%)	35 (89.7%)	.7487
F	11 (9.2%)		7 (8.8%)	4 (10.3%)	
Age at time of surgery (years)					
Mean (standard deviation)	23.3 (3.8)	21.0 (3.9)	22.9 (3.6)	24.3 (4.0)	.0488
Min; Max	18; 35	18; 29	18; 35	18; 33	
Age as a categorical variable (years)					
> 20	89 (74.8%)	3 (33.3%)	56 (70.0%)	33 (84.6%)	
≤ 20	30 (25.2%)	6 (66.7%)	24 (30.0%)	6 (15.4%)	
Time from surgery to completion of the questionnaire (months)					
Mean (standard deviation)	26.7 (9.8)	24.3 (7.2)	25.8 (9.6)	28.4 (10.0)	.37
Min; Max	12; 56	16; 36	12; 56	14; 48	
Time between the first luxation and surgery (months)					
Mean (standard deviation)	13.8 (12.9)		13.8 (13.3)	13.7(12)	.78
Min; Max	0.2; 57.7		0.2; 57.7	0.4; 52	
Sporting level					
n (difference of means)	118 (1)	9	79 (1)	39	
National	57 (48.3%)	5 (55.6%)	48 (60.8%)	9 (23.1%)	.0007
Regional	45 (38.1%)	4 (44.4%)	22 (27.8%)	23 (59.0%)	
Recreational sportsperson	11 (9.3%)		6 (7.6%)	5 (12.8%)	
International	5 (4.2%)		3 (3.8%)	2 (5.1%)	
Sport					
n (difference of means)	118 (1)	9			
Rowing	1 (0.8%)		1 (1.3%)		
Basketball	1 (0.8%)		1 (1.3%)		
Bmx Racing	1 (0.8%)		1 (1.3%)		
Bodyboarding	1 (0.8%)		1 (1.3%)		
Boxing	1 (0.8%)			1 (2.6%)	
Canöening	5 (4.2%)	1 (11.1%)	5 (6.3%)		
Climbing	3 (2.5%)		1 (1.3%)	2 (5.3%)	
Soccer	9 (7.5%)		5 (6.3%)	4 (10.5%)	
Football (American)	2 (1.7%)		2 (2.5%)		
Handball	3 (2.5%)		3 (3.8%)	3 (7.9%)	
Ice Hockey	2 (1.7%)		2 (2.5%)		
Judo	4 (3.4%)		4 (5.0%)		
Motorcycle racing	1 (0.8%)			1 (2.6%)	
Swimming	1 (0.8%)		1 (1.3%)		
Pelote	2 (1.7%)		2 (2.5%)		
Rugby league	1 (0.8%)		1 (1.3%)		
Rugby union	67 (56.8%)	8 (88.9%)	44 (55.0%)	23 (60.5%)	
Skiing	2 (1.7%)		2 (2.5%)	2 (5.3%)	
Snowboarding	1 (0.8%)		1 (1.3%)		
Surfing	1 (0.8%)		1 (1.3%)		
Tennis	2 (1.7%)		2 (2.5%)		
Archery	1 (0.8%)			1 (2.6%)	
Sailing	1 (0.8%)			1 (2.6%)	
Type of sport					
n (difference of means)	118 (1)	9	80	38 (1)	
With contact	87 (73.7%)	8 (88.9%)	57 (71.3%)	30 (78.9%)	.4267
Pivot	29 (24.6%)	1 (11.1%)	22 (27.5%)	7 (18.4%)	
Without risk	2 (1.7%)		1 (1.3%)	1 (2.6%)	.

p = *P* value for a Fisher's exact test for qualitative variables.
p = *P* value of a Student's *t* test for quantitative variables.

The frequency of return to training was significantly lower for the Bankart group (88.2%) than for the Latarjet group (97.3%) ([HR] = 0.597, 95% CI = [0.369; 0.944], *P* = .031) (Tables III and VI). The time to return to training was, on average, significantly shorter for the Laterjet group, at 5.1 months, versus 6.4 months for the Bankart group (Tables IV and VII, *P* = .034). There was a nonsignificant trend towards a faster return to training for the "national" and "international" levels (5.5 months) than for the "regional" level (6.4 months, *P* = .050).

The return to competition was significantly less frequent for the Bankart group (85.3%) than for the Latarjet group (95.8%; [HR] = 0.600, 95% CI = [0.365; 0.961], *P* = .038; Tables III and VI). A nonsignificant trend was observed for time to return to competition, with a faster return (6.2 months) for the Latarjet group than for the Bankart group (7.3 months; Tables IV and VII; *P* = .057).

Discussion

In this study, the most important result is that we founded 2.5% recurrence for Latarjet and 17.9% for Bankart. Indeed, in the literature noncomparative series have shown the risk of recurrence to be low for Latarjet procedures: 3.8% according to Torg,[33] 10% according to Louaste,[24] 7% in rugby players according to Neyton[28] and 4.4% for a follow-up period of 15 years according to Hovelius.[19] Recurrence rates are higher for Bankart interventions, with

Table III
Frequencies of recurrence, return to training, and return to competition.

Variable	Total	Latarjet	Bankart
Recurrence			
n	119	80	39
No	110 (92.4%)	78 (97.5%)	32 (82.1%)
Yes	9 (7.6%)	2 (2.5%)	7 (17.9%)
Return to training			
n	108	74	34
No	6 (5.6%)	2 (2.7%)	4 (11.8%)
Yes	102 (94.4%)	72 (97.3%)	30 (88.2%)
Return to competition			
N	106	72	34
No	8 (7.5%)	3 (4.2%)	5 (14.7%)
Yes	98 (92.5%)	69 (95.8%)	29 (85.3%)

The two patients practicing sports considered to be without risk were not considered in this analysis. We also excluded sportspeople not participating in competition from this analysis.

Table IV
Description of time to recurrence and time to return to sport.

Variable	Both types of surgery	Latarjet	Bankart
Time to recurrence (month)			
n	9	2	7
Mean (standard deviation)	14.0 (8.6)	12.5 (9.2)	14.4 (9.1)
Median (Q1; Q3)	12 (7; 19)	13 (6; 19)	12 (7; 24)
Min; Max	6; 30	6; 19	6; 30
Time to return to training (months)			
n	109	76	33
Mean (standard deviation)	5.5 (2.4)	5.1 (2.4)	6.4 (2.3)
Median (Q1; Q3)	5 (4; 7)	5 (4; 6)	6 (5; 8)
Min; Max	2; 12	2; 12	3; 12
Time to return to competition (months)			
N	104	74	30
Mean (standard deviation)	6.5 (2.5)	6.2 (2.5)	7.3 (2.5)
Median (Q1; Q3)	6 (5; 9)	6 (5; 8)	7 (5; 9)
Min; Max	3; 12	3; 12	3; 12

Table V
Multivariate analysis of the factors potentially associated with recurrence: Cox model.

Variable	Comparison	Hazard ratio (HR) ($N = 115$)	95% CI of the HR	*P* value
Surgery				<.001
	Bankart vs. Latarjet	12.404	[2.7, 97.605]	
Age group				.007
	$\leq$ 20 vs. >20 years	14.259	[2.539, 112.529]	
Type of sport				.985
Sporting level				1.000
Sex				1.000

The 2 patients practicing a sport considered to be without risk were not considered in this analysis. We also excluded those not engaged in competition from this analysis.

Table VI
Multivariate model for the frequencies of return to training and return to competition: Cox model.

Variable	Comparison	*P* value	Training multivariable HR 95% CI ($N = 106$)	*P* value	Competition multivariable OR 95% CI ($N = 105$)
Surgery	Bankart vs. Latarjet	.031*	0.597 [0.369, 0.944]	.038*	0.600 [0.365, 0.961]
Age group	Age > 20 vs. age $\leq$ 20 years	.734		.217	
Sporting level		.171		.493	
Sex	F vs. M	.840		.254	
Type of sport		.893		.117	

* Significant ($P < .05$).

reported rates of 14% for Calvo,[11] 15% for Balg,[3] and 20.8% for Khiami.[21] Similarly, in comparative series, Hovelius[20] found, after 17 years of follow-up, that the recurrence rate was lower for block-based procedures ($P = .017$), and Bliven[6] obtained similar results in a meta-analysis, in which the recurrence rates were 11.6% for Latarjet procedures and 21.1% for Bankart procedures. In our study, we showed a significant difference with an adjusted HR of 12.404, (95% CI = [2.7; 97.605], $P < .001$. These differences may be accounted for by the greater solidity of the block assembly than of the Bankart intervention. Indeed, Clavert[14] showed in a cadaver

Table VII
Adjusted multivariate analysis of the time to return to training, and time to return to competition: analysis of variance.

Variable	Comparison	Training				Competition			
		P value	Adjusted mean (standard error)	Adjusted difference of means (standard error)	Two-tailed 95% CI	*P* value	Adjusted mean (standard error)	Adjusted difference of means (standard error)	Two-tailed 95% CI
Surgery	Latarjet Bankart	.034*	5.339 (0.506) 6.499 (0.585)	1.16 (0.54)	[0.088; 2.233]	.057	6.347 (0.526) 7.445 (0.612)	1.097 (0.57)	[−0.035; 2.229]
Age group	Age ≤ 20 age >20 years	.644	5.796 (0.619) 6.041 (0.455)	0.245 (0.527)	[−0.802; 1.291]	.416	6.671 (0.644) 7.121 (0.475)	0.45 (0.551)	[−0.644; 1.544]
Sex	M F	.513	5.611 (0.352) 6.227 (0.876)	0.616 (0.938)	[−1.247; 2.48]	.692	6.7 (0.381) 7.092 (0.912)	0.392 (0.988)	[−1.57; 2.355]
Sporting level	International or national Regional	.05	5.416 (0.502) 6.421 (0.573)	1.005 (0.507)	[−0.002; 2.011]	.431	6.685 (0.523) 7.107 (0.599)	<0.423 (0.534)	[−0.639; 1.484]
Type of sport	With contact Pivot	.753	6.014(0.545) 5.824(0.579)	−0.19 (0.601)	[−1.384; 1.004]	.787	6.807 (0.572) 6.985 (0.614)	0.177 (0.656)	[−1.126; 1.48]

* Significant ($P < .05$).

study that 3 types of resistance had to be overcome, in a stepwise manner, to cause a dislocation after bone block surgery: first, the capsule had to be ruptured, then the bone block, and finally the tendon joined to the front. He demonstrated differences in resistance between groups: the peak force required for rupture was 486 Nm for the "intact" group, 263 Nm for the Bankart group, and 606 Nm for the Latarjet group. These results confirm the solidity of the Latarjet intervention. In France, the Instability Severity Index Score (ISI score[3]) was developed for the prediction of recurrence risk for Bankart procedures as a function of age (over or under 20 years), participation or nonparticipation in competition, type of sport, joint mobility, and radiological lesions. The maximum total score is 10 points. For scores greater than 6, the risk of recurrence is 70%. Thomazeau[32] recommend a "barrier score" of 4 or less for Bankart procedures, with a recurrence rate of 3.2% after 18 months. Bessière[5] proposed Latarjet surgery after dislocation for "barrier scores" of 3 or more. Hardy[17] more recently recommended a "barrier score" of 2, confirming the importance of taking age, sporting level, and type of sport into account when deciding on the most appropriate surgical technique.

However, assessment of surgical quality also requires the consideration of aspects other than recurrence rates in our study. The proponents of the Bankart technique often vaunt the lower rates of postoperative complications than for bone block techniques. For example, the meta-analysis performed by Bliven[6] reported re-intervention rates of 5% for block-based techniques, versus only 3.1% for Bankart interventions. Similarly, Bokshan[8] found, for 2864 cases, a rate of complications 30 days after surgery of 5.5% for open block-based interventions, 1% for open Bankart interventions, and 0.6% for arthroscopic Bankart interventions. However, the clinical differences are small, and the nature of the complications recorded (eg, hematoma, pain) may be subjective, and, even in cases of re-intervention, they do not seem to compromise the final result, which seems to be better for Latarjet procedures, in terms of the rates of return to work, activities and sport.[6] Another point that must be considered when assessing the efficacy of surgery is the possibility of successful re-intervention after stabilization failure, as in cases of recurrence after returning to sport. For Latarjet interventions, an iliac block can be proposed, and this approach yields satisfactory results,[27] despite the complexity of the surgical intervention required. In cases of Bankart intervention, a block can be proposed, for which the clinical results (pain and Walch-Duplay score) seem to be slightly poorer than those achieved in patients undergoing block-based procedures without prior Bankart intervention.[17] Finally, in the long term, the risk of arthropathy after Latarjet procedures seems to be similar to that in the general population, over a period of more than 33 years.[16]

Our results for sporting practice are generally similar to published findings, reporting rates of return to sport of 66% to 93%.[4,7,26] The time to return to sport ranges from 5 to 7 months, depending on the series considered.[4,7,26] However, the key finding of our study concerns the comparison of the 2 principal surgical techniques, integrating the factors likely to influence the statistical results (adjusted analysis). We found that the rate of return to training was higher ($P = .031$) for Latarjet procedures (97.3%) than for Bankart procedures (88.2%). The rate of return to competition was also higher ($P = .038$) for Latarjet (95.8%) than for Bankart (85.3%) procedures. We also found that the return to training was faster ($P = .034$) for Latarjet (5.1 months) than for Bankart (6.4 months) procedures. This "return to training" parameter has rarely been analyzed, but is important for planning the return to sport. The results for return to sport are in favor of the Latarjet procedure, as in most studies,[6] although a few recent studies[1,23] have focused particularly on the high rates of return to sport linked to surgical procedures performed by arthroscopy, as opposed to open surgery, whether by the Latarjet or Bankart approach.

In terms of methodology, this study is subject to certain biases including selection bias in particular, as in all observational cohort studies. Nevertheless, the associated bias was limited, as we included all patients answering the first call in the study. Despite the absence of randomization at inclusion, the large population, with comparable baseline characteristics, and the performance of adjusted analyses reduced potential biases. Furthermore, the statistical analysis was adjusted for factors potentially associated with a given event of interest. The adjusted comparisons take confounding factors into account and are, thus, interpretable.

For this study, a telephone questionnaire was performed a mean of more 2 years after surgery. This time lag is shorter than in other studies,[19] but our methodology was otherwise very similar to that of Wright.[35] Our response rate of 61.5% for the questionnaire is typical of the rates classically reported in other studies.[31,35]

The choice between Latarjet and Bankart procedures for young sportspeople engaged in competition seems to favor Latarjet interventions, despite the slightly higher reported rates of complications, but a number of unanswered questions remain. First, there will probably be a need, in the future, to define more precisely the place of arthroscopy in Latarjet interventions, because arthroscopic procedures seem to result in fewer complications than open surgery[8,25] and very high rates of return to sport.[1,23] Second, the use of new fixation systems, such as endobuttons, should be explored, as a

possible improvement over single or double screws. In any case, although the choice of surgical technique remains the prerogative of surgeons, they should take into account factors potentially influencing the results, such as age and sport practiced (competition, sport at risk of shoulder injury, sporting level). Indeed, in young sportspeople, the time away from sport may determine whether it is possible to pursue a sporting career. The sporting aspects, particularly in young sportspeople, must therefore be taken into account, despite the slightly higher risk of complications reported in previous studies for Latarjet procedures.

Conclusion

The risk of recurrence is significantly higher ($P < .001$) for Bankart procedures than for Latarjet procedures. Being 20 years old or younger is a significant risk factor for recurrence. Return to sport is significantly more frequent for Latarjet procedures, in terms of both training ($P = .031$) and competition ($P = .038$), and is significantly faster for training ($P = .034$), at a mean of 5.1 months, as opposed to 6.4 months for Bankart procedures. In the future, it will be important to take these factors into account in the choice of surgical technique for young patients engaged in competitive sport and practicing sports at risk of shoulder injury, to maximize the chances of these individuals being able to continue to practice their sports.

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