

High Rates of Return to Play and Low Recurrence Rate After Arthroscopic Latarjet Procedure for Anterior Shoulder Instability in Rugby Players



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Purpose: To analyze the rate of return to play, changes in athletic level, and recurrence rate and to report subjective outcomes in a series of rugby players with anterior shoulder instability who underwent an arthroscopic Latarjet procedure. **Methods:** A multicenter retrospective study done in 2 centers on rugby players who were operated on between January 2011 and December 2020 was performed. Rugby players who underwent arthroscopic Latarjet procedure for anterior shoulder stabilization with a minimum follow-up period of 2 years were included. Rugby players were grouped according to their competitive level in their country (recreational, regional, national, and international). Data collected included return to sport after surgery, time to return to rugby, athletic level before and after surgery, patient satisfaction, and subjective scores. Recurrence and apprehension rates were also evaluated. **Results:** A total of 73 subjects were included. Mean age at time of surgery was 23 ± 5 years. Mean duration of follow-up was 5 ± 2.6 years. Eighty-four percent of rugby players returned to rugby within a mean period of 6.6 months. Initial athletic level was a significant factor ($P = .012$) for not returning to sport, with 67% of patients who initially played at a recreational level not returning to rugby and 33% of patients who initially played at a regional league level not returning. All national and international players returned to play. Of the 12 non-returning rugby players, only 30% did not return because of their shoulder. Mean Subjective Shoulder Value was $90 \pm 9\%$. Recurrence rate was 7%. **Conclusions:** Arthroscopic Latarjet procedure proved its efficacy in managing recurrent anterior shoulder instability in rugby players. Return to play was achieved in almost all cases, with low recurrence rates. Despite high global return to the same level of sport, the higher the level of competition, the harder it is for rugby players to resume sport at the same level. **Level of Evidence:** Level IV, therapeutic case series.

Rugby players are at high risk of shoulder injury, as rugby is known as a collision sport that may expose the shoulder to various injuries.¹⁻³ Knee and shoulder injuries are the most common injuries in rugby players.⁴ Tackles are the most common cause of initial shoulder dislocation in rugby players.^{1,3-5}

Shoulder instability is disabling for young athletes involved in this competitive collision sport, with a high risk of recurrence. Among all injuries sustained by professional rugby players, shoulder injuries keep players off the field for the longest time.^{1,3} Stabilizing surgery is therefore often recommended to allow these players to resume rugby practice, regain their preinjury level, and have satisfactory performance of their shoulder. In rugby players, soft tissue procedures such as Bankart repair have resulted in recurrence rates between 13% and 34%.⁶⁻⁸ The Latarjet procedure has proven its efficacy in the treatment of anterior instability by restoring the articular arc, with the conjoint tendon acting as a sling in the abduction and external rotation of the shoulder.^{9,10} The purpose of our study was to analyze the rate of return to play, changes in athletic level, and recurrence rate and to report subjective outcomes in a series of rugby players with anterior shoulder instability who underwent an arthroscopic Latarjet procedure. We hypothesized that the arthroscopic Latarjet procedure would allow

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restoration of shoulder stability, with a high rate of return to preinjury rugby level and a low recurrence rate of instability.

Methods

Study Population

We conducted a retrospective multicenter study across 2 orthopedic centers involving patients who underwent surgery for anterior shoulder instability between January 2011 and December 2020. Rugby players who underwent arthroscopic Latarjet procedure for anterior shoulder instability and had a minimum 2-year follow-up were included. Patients who were not rugby players, had associated posterior instability, underwent an open Latarjet procedure, or underwent revision surgery were excluded. The arthroscopic Latarjet was performed by 2 senior surgeons (G.N. and P.M.) at their respective institutions who are experts in treating anterior shoulder instability. Seventy patients (95%) had an anterior labral lesion, 65 (89%) showed a Hill-Sachs lesion, and 47 (64%) showed varying degrees (range, 10%-28%) of anterior glenoid bone loss as measured by the best-fit circle method on computed tomography.

Preoperative Evaluation

All included rugby players had multiple episodes (at least 2) of anterior shoulder dislocation that was reduced by trained medical personnel. Clinical examination was conducted, and anterior shoulder instability was confirmed by the orthopedic surgeon. For all patients, preoperative imaging was systematically obtained and showed signs of anterior instability after analysis.¹¹

Surgical Management

Arthroscopic Latarjet was performed on all patients according to the surgical technique described in 2010 by Lafosse and Boyle.¹² Two screws were used to fix the coracoid bone graft to the glenoid.

Postoperative Treatment

Patients received standardized postoperative physical therapy and followed a rehabilitation program. Patients' shoulders were immobilized in a sling and swathe. Rehabilitation was started 3 to 4 days postoperatively with passive mobility exercises, and shoulder external rotation was limited to 3 weeks postoperatively. Physical activity in the form of walking, running, and cycling was allowed at 2 months postoperatively. Patients were allowed to return to sports after regaining preoperative shoulder strength and pain-free range of motion. All patients underwent a low-dose computed tomography of their operated shoulder at 3 months postoperatively to check the

position of the coracoid graft and the position of the screws and to evaluate the consolidation of the coracoid to the glenoid as defined by a bony bridge between the coracoid and the glenoid.

Outcomes

Data were collected from patients' medical records by G.N. and M.M. during follow-up. Patients were contacted via phone between December 2022 and March 2023 and asked to answer a custom questionnaire to assess preoperative and postoperative involvement in sports. All those contacted gave informed consent for the use of data from their hospital records. The study was approved by an appropriate scientific ethics committee. The outcomes were return to sport after surgery, time to return to rugby practice, athletic level before and after surgery, patient satisfaction after surgery, recurrence, and apprehension rate.

Subjective assessments included the measurement of Subjective Shoulder Value (SSV). Additionally, patients were queried about the status of their shoulder's performance compared with its condition prior to the injury that caused instability, assessing whether it had worsened, remained the same, or improved. Recurrence and apprehension were distinguished based on our definitions. For us, recurrence pertained to an actual dislocation or sensation of anterior shoulder subluxation. By contrast, apprehension was characterized as lingering fear associated with certain shoulder movements without the involvement of dislocation or subluxation. We also studied the factors that could influence non-return to sport.

Statistical Analysis

The statistical analysis was carried out with Easy-MedStat version 3.17 (www.easymedstat.com). Qualitative variables were compared with a nonparametric Mann-Whitney test and the χ^2 test. Intra-group variations were tested using the Wilcoxon test. Quantitative data were expressed using mean and standard deviation. For all analyses, $P < .05$ indicated a statistically significant difference.

Results

Study Population

Among the 985 Latarjet procedures performed during the study period, 147 surgeries were performed on rugby players. Ten patients with associated posterior instability and 40 patients who underwent open Latarjet procedures (performed before the senior surgeons adopted the arthroscopic Latarjet technique) were excluded. Additionally, ten patients undergoing revision surgeries were also excluded. Eighty rugby players with 80 shoulders who underwent arthroscopic Latarjet for their shoulder anterior instability met our

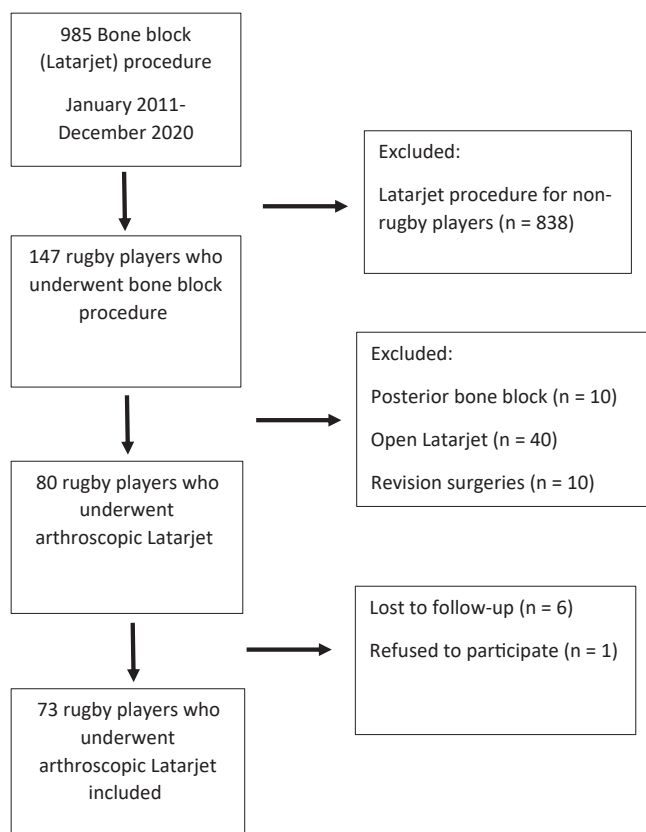


Fig 1. Patient selection process.

inclusion criteria. One patient refused to participate in the study and 6 were lost to follow-up. Seventy-three patients (71 males and 2 females) with a mean age of 21 ± 5 years were included (Fig 1).

Return to Sport

At the latest follow-up (mean, 5 ± 2.6 years), 84% (n = 61) of rugby players had returned to rugby within a mean period of 6.6 months (range, 3-18) post-operatively, whereas 16% did not resume rugby. Differences in athletic levels were noted in our population based on the category in which rugby players participated in their country: 31% (n = 22) participated at a recreational level and 38% (n = 28) participated at a regional level, whereas 27% (n = 20) met national standards and 4% (n = 3) met international standards, with a total of 69% of players involved in competitive rugby. Mean age at surgery was 23 ± 5 years, and the dominant shoulder was operated on in 59% of cases (Table 1).

Eighty-two percent (n = 60) of the initial injuries were related to rugby practice, with most of the initial injuries (60%) caused by a tackle during a rugby match (n = 36), 12% occurring during training (n = 7), 7% occurring following a direct fall (n = 4), 3% occurring following direct impact with an opponent (n = 2), and

Table 1. Patient Preoperative Characteristics

Number of shoulders	73
Sex	
Male	71
Female	2
Dominant shoulder involvement	43
Age at time of first episode of anterior instability	21 (15-44)
Age at surgery	23 (17-48)
Sport level	
Recreational	22
Regional	28
National	20
International	3
Total	73
Initial injury causing anterior instability	
Rugby	60
Tackle	36
Training	7
Direct fall	4
Direct impact with adversary	2
Other	13

15% attributable to other causes (n = 13). Mean age at the time of injury was 21.3 ± 5.2 years.

We separated competitive (international, national, and regional) and recreational players into 2 groups. We found that competitive players (n = 51, mean age at injury, 20.33 ± 4.1 years) had a tendency to become injured at a younger age compared with recreational players (n = 22, mean age at injury, 23.41 ± 6.87 years), with a P value of .053, which was not significant.

Among the 12 non-returning rugby players, only 33% (n = 4) did not return because of their shoulder. The remaining 67% (n = 8) did not return for other reasons, mainly fear of reinjury and social reasons (change of location, new posting, or family-related).

Regarding players' age at the time of surgery, among the 16% (n = 12) who had not resumed rugby practice, there was no statistical difference in age to resume their rugby activities (19.25 ± 2.9 years) who did not return versus 21.66 ± 5.52 years who did return (P = .171). When comparing postoperative return to rugby practice based on preoperative athletic level, there was a significant difference (P = .012) between patients whose level was recreational and those with higher athletic levels, as 67% (n = 8) of patients who did not return to rugby played at a recreational level and 33% played at a regional level. All national and international rugby players returned to the sport (Table 2).

We also tracked postoperative changes in athletic level. Among patients who returned to rugby post-operatively, 82% (n = 50) enjoyed the same or better athletic level postoperatively, and there was a significant difference between preoperative and postoperative athletic level for patients who returned to sport (P < .001). Of the patients who returned to rugby

Table 2. Return to Sports Postoperatively According to Athletic Level

	Preoperative athletic level			
	Recreational	Regional	National	International
Return to rugby (n= 61)	14 (64)	24 (86)	20 (100)	3 (100)
Non-return to rugby (n= 12)	8 (36)	4 (14)	0 (0)	0 (0)

practice, 93% playing at a recreational level returned to rugby at the same level, and 83% of those playing at a regional level returned to the same level. Only 1 of 3 patients playing at an international level resumed rugby at the same level, whereas 70% of patients playing at a national level continued to play at the same level. We also observed that 18% (n = 11) of players who resumed rugby had a decrease in their level postoperatively, and only 3% (n = 2) improved their athletic level in the postoperative period (Table 3).

Recurrence of Instability

Recurrence of instability was noted in 5 patients (7%) with a mean follow-up period of 3.3 ± 2.1 years after surgery. Three of these patients had a recurrence following a new major trauma to the shoulder and underwent surgery with an iliac crest bone block. Among the rugby players who returned to sports, 10% (n = 7) had persistent apprehension without any noted episode of instability.

With respect to athletic level and patient-reported shoulder performance postoperatively, 68% (n = 47) of patients felt that their shoulder performance was the same as before the injury, 25% (n = 17) felt that their shoulder performance had decreased after surgery, and 7% (n = 5) felt an improvement in their shoulder performance postoperatively. The average SSV score was $90 \pm 9\%$. Ninety-nine percent (n = 72) of patients were satisfied with the surgery and would do it again if given the choice.

Complications

Five players had recurrence of instability. All of these patients had a revision surgery with an iliac crest bone block that was fixed with 2 screws. Five rugby players had another surgery for screw removal because of persistent unexplained shoulder pain for at least 1 year after the surgery. Four patients had no visible bone bridge between the coracoid and the glenoid but were completely asymptomatic, and no other action was

taken. No major complications or neurovascular injuries were noted in our series.

Discussion

Our study showed that rugby players who underwent arthroscopic Latarjet procedure for anterior instability achieved excellent results, with 84% returning to play a mean period of 6.6 months after the procedure. The recurrence rate was 7%. Neyton et al.^{10,13} found that among a respective 79 and 34 rugby players who underwent an open modified Latarjet procedure, 65% and 68% returned to rugby and 7% experienced a recurrence of instability. In 2008, Bonneville et al.⁶ reported that among 21 rugby players who underwent an open Neer capsuloplasty, 97% returned to play, but they also documented a 17% recurrence of instability. In 2006, Larrain et al.⁸ reported an 84% return to sports and a 13.4% recurrence rate in 197 rugby players, among whom 160 underwent arthroscopic Bankart surgery and 37 underwent open Latarjet. In 2018, Ranalletta et al.¹⁴ reported a 93.7% return to rugby in 48 players after an open Latarjet procedure without capsulolabral repair. No recurrence of instability was noted in their series, but the Latarjet procedure was performed as revision surgery in two-thirds of cases. Finally, in a study on 88 rugby players who underwent an arthroscopic Bankart repair, Pasqualini et al.⁷ reported 73.8% return to sports at a mean of 6.8 months and a recurrence rate of 32.3%, which is considered very high. They also suggested that the position in the field should be an important factor in predicting the return to play. Table 4 compares findings obtained by several studies regarding different surgical techniques for the treatment of anterior shoulder instability in rugby players.

The aforementioned studies showed high recurrence rates of instability after arthroscopic and open Bankart procedures.⁶⁻⁸ Furthermore, Castagna et al.¹⁵ showed that among teenagers involved in overhead and contact sports who received arthroscopic capsulolabral

Table 3. Sport Level Preoperatively and Postoperatively

Athletic level preoperatively		Athletic level postoperatively			
		Recreational	Regional	National	International
	Recreational	93 (n = 13)	0	7 (n = 1)	0
	Regional	13 (n = 3)	83 (n = 20)	4 (n = 1)	0
	National	10 (n = 2)	20 (n = 4)	70 (n = 14)	0
	International	0	0	67 (n = 2)	33 (n = 1)

Table 4. Comparison Between Previous Studies Regarding Anterior Stabilization Procedure in Rugby Players

First Author; Journal	Year	Level of incidence	Surgery type	Athletes number	Mean age at surgery	Mean follow-up in month	Return to sports	Complications
Neyton et al; <i>J Shoulder Elbow Surg</i>	2012	4	Open Latarjet-Patte procedure	34	23.4 (17-33)	144	65%	Persistent apprehension 14%
Neyton et al; <i>Journal de traumatologie du sport</i>	2007	4	Open modified Latarjet procedure	85	22.2	75	68%	Recurrence = 7%
Bonneville; <i>RCOT</i>	2008	4	Neer capsuloplasty	21	21 (16-34)	82	97%	Recurrence = 17%
Larraine; <i>Arthroscopy</i>	2006	4	Arthroscopic Bankart = 160 Open Latarjet = 37	97	-	71	84%	Recurrence = 13.4%
Ranalletta; <i>Am J Sports Med</i>	2018	4	Open Latarjet without capsulolabral repair	48	22.8 (17-35)	48	93.7%	Reoperation for screw removal 1% No recurrence of instability
Pasqualini; <i>Shoulder Elbow 0</i>	2022	4	Arthroscopic Bankart repair	88	21.1	59.5	73.8%	Recurrence = 32.3%
Our study	2023	4	Arthroscopic Latarjet	73	23 (17-48)	60	84%	Recurrence = 7%

surgery, the recurrence rate of those playing rugby was 33.3%. In most cases, rugby is a competitive collision sport that is practiced mostly by a young population, and these players' shoulders are exposed to various instability injuries, which results in high recurrence of instability.¹⁶ In this population, a high risk of failure of the Bankart procedure can be expected because most of these rugby players have a high Instability Severity Index Score.¹⁷ Apprehension with external rotation with the arm in 90° of abduction without recurrence of instability after surgery can be problematic for professional rugby players because it affects their shoulder performance.¹⁸ Apprehension after open and arthroscopic Latarjet is well described in the literature, and the rate of 10% found in our study is similar to that observed in multiple studies.¹⁹⁻²¹ A prospective multicenter study by Metais et al.²¹ on the results of arthroscopic and open Latarjet showed persistence of apprehension in 11% of cases regardless of surgical technique with or without reinsertion of the capsule.

Other important findings of our study included the fact that rugby was the initial cause of anterior shoulder instability in 82% of cases and tackle during a rugby match was the most common cause of injury in 60% of cases. Several studies have reported that tackle is the leading cause of shoulder injury in rugby.^{1-3,22} Even though we did not find a significant statistical difference between the groups, we noted that competitive players were more likely to sustain a shoulder injury at a younger age (20.3 vs 23.4 years, $P = .053$). One possible explanation is that competitive rugby players practice for longer periods of time and at higher levels with more physical engagement to achieve their full potential, which predisposes them to injury at a younger age. Another significant finding in our study was that 67% of rugby players who did not resume rugby were recreational players and 33% were regional league players, whereas all national and international players resumed competitive rugby. This can be explained by the fact that recreational athletes may discard rugby practice with less reluctance than competitive players, as rugby is not their main area of focus. Therefore, fear of reinjury may lead them to discontinue rugby or shift to another sport. This point should be taken into consideration when patients are asked why they stopped or chose another sport. Of the players who did not resume rugby practice, only 33% (n = 4) of those questioned in our series did not return to rugby because of their shoulder injury; they abandoned the sport because of psychological or social factors, which included new postings, change of address, and fear of reinjury. Other series have had similar results. For example, Neyton et al.¹⁰ reported a 68% return to rugby following surgery, with just 1 patient unable to return because of shoulder

difficulties, the remainder unable to return because of other factors.

In instability surgery, return to sports is extremely important; however, although functional instability scores such as the Walch-Duplay and Western Ontario Shoulder Instability Index scores have criteria for return to sports and shoulder satisfaction, they do not mention causes of non-return to sports. Our findings suggest that non-return to sports in rugby players is most often not attributable to shoulder function. Therefore, other scores should be used to assess the psychosocial factors of these players and their readiness to get back to the game. A meta-analysis conducted in 2013 by Ardern et al.²³ reviewed 11 studies that evaluated psychosocial factors and their impact on return to sports after injury. Other scores and models, in our opinion, should be used to examine aspects other than shoulder status for resuming sports. Creighton et al.²⁴ proposed a model for return to sports that takes into account medical factors, participation factors, and choice modifiers (e.g., family, financial reasons, and timing). Gerometta et al.²⁵ validated a score more related to the shoulder—the Shoulder Instability-Return to Sport After Injury score—and also included psychological readiness of players to resume sports but did not take into consideration external factors other than shoulder status.

In our study, 82% (n = 50) of rugby players who returned to sports returned to the same or higher level of sport postoperatively. The higher the athletic level of the rugby player, the higher the odds they would drop a level after shoulder surgery ($P < .001$), as 93% of patients playing at a recreational level returned to the same level and 83% of patients playing at a regional level returned to the same level; however, only 1 of 3 patients playing at an international level resumed rugby at the same level, whereas 70% of patients playing at a national level continued to play at the same level. Gowd et al.²⁶ found in a retrospective study on 60 athletes that only 60% returned to the same or higher level of sport postoperatively. On studying the results of the Latarjet procedure in contact and collision athletes, Privitera et al.²⁷ found that only 49% resumed their same level of sport, with an 8% recurrence rate overall. A recent meta-analysis done in 2017 by Ialenti et al.²⁸ found a 73% return to preinjury sport level after a Latarjet procedure. Return to the same level of sport following arthroscopic Bankart repair was also reported in the literature, with rates ranging from 60% to 65%.^{7,29,30} Five patients received additional surgery for screw removal after 1 year of unexplained shoulder pain and discomfort, with good results.³¹ Screw removal after a Latarjet procedure has been proven for pain relief, as the screws can cause impingement of the subscapularis muscle anteriorly.

Limitations

Our study has various limitations, including the fact that it was a multicenter retrospective analysis of a single surgical method with no comparison group with additional procedures. Moreover, we did not evaluate functional scores in the postoperative period, as this was not the purpose of the study. Additionally, only 2 females were included in the study, limiting the generalizability of our findings to female populations. Furthermore, we did not collect patient-reported outcome measures, which could have provided additional insights into patients' subjective experiences and functional outcomes postsurgery. Another limitation is that we collected data at only a single time point, which may not fully capture the longitudinal changes and outcomes over time. Finally, there is the potential for recall bias, as data were collected retrospectively, which could have influenced the accuracy and reliability of the information obtained.

Conclusions

Our study confirmed the efficacy of the arthroscopic Latarjet procedure in managing recurrent anterior instability in rugby players, leading to patient satisfaction. Return to play was achieved in almost all cases, with low recurrence rates. Despite high global return to the same level of sport, the higher the level of competition, the harder it is for rugby players to resume sport at the same level.

Disclosures

The authors report the following potential conflicts of interest or sources of funding: P.M. reports royalties from Mitek. This study received institutional review board approval (COS-RGDS-2023-03-002-NOURISSAT-G). The manuscript underwent professional English language editing through COS Ramsay Santé. Full ICMJE author disclosure forms are available for this article online, as [supplementary material](#).

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