Return to Play After the Latarjet Procedure for Anterior Shoulder Instability

CME

A Systematic Review

Eoghan T. Hurley,*†‡ MB, BCh, Connor Montgomery,† MB, BCh, MSc, M. Shazil Jamal,†‡ MB, BCh, Yoshiharu Shimozono,§ MD, Zakariya Ali,†‡ Leo Pauzenberger,† MD, and Hannan Mullett,† MCh, FRCSI (Tr & Orth)
Investigation performed at the Sports Surgery Clinic, Dublin, Ireland

Background: Traumatic anterior shoulder instability is a common clinical problem among athletic populations. The Latarjet procedure is a widely used treatment option to address shoulder instability in high-demand athletes at high risk of recurrence. However, rates and timing of full return to sports have not been systematically analyzed.

Purpose: To systematically review the evidence in the literature to ascertain the rate and timing of return to play and the availability of specific criteria for safe return to play after the Latarjet procedure.

Study Design: Systematic review.

Methods: A systematic literature search was conducted based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, using the EMBASE, MEDLINE, and Cochrane Library databases. Eligible for inclusion were clinical studies reporting on return to play after the Latarjet procedure. Statistical analysis was performed by use of SPSS.

Results: Our review found 36 studies including 2134 cases meeting our inclusion criteria. The majority of patients were male (86.9%), with a mean age of 25.4 years (range, 15-59 years) and a mean follow-up of 83.5 months. The overall rate of return to play was 88.8%, with 72.6% returning to the same level of play. Among collision athletes, the overall rate of return to play was 88.2%, with 69.5% returning to the same level of play. In overhead athletes, the overall rate of return to play was 90.3%, with 80.6% returning to the same level of play. The mean time to return to play was 5.8 months (range, 3.2-8 months). Specific return to play criteria were reported in the majority of the studies (69.4%); time to return to sport was the most commonly reported item (66.7%).

Conclusion: The overall rate of return to play was reportedly high after the Latarjet procedure. However, almost a fifth of athletes returning to sports were not able to return at the same level. Further development of validated criteria for safe return to sports could potentially improve clinical outcomes and reduce recurrence rates.

Keywords: Latarjet; anterior shoulder instability; systematic review; return to play

Considerable debate exists regarding how to best treat anterior shoulder instability in athletes. The coracoid transfer, often referred to as the Latarjet procedure, is commonly used in these patients. The Latarjet procedure is especially indicated in the setting of significant glenoid bone loss, Hill-Sachs lesions, or collision sports, as studies have shown reduced recurrence rates compared with Bankart repairs as well as excellent long-term outcomes.[3,29] Recently, interest has increased in performing the Latarjet procedure arthroscopically for decreased stiffness and quicker rehabilitation, but concerns remain due to the complexity of this operation when performed arthroscopically.[30]

Warth et al[47] found that among athletes undergoing surgery for anterior shoulder instability, return to sports at previous levels was more important than anything else, including postoperative recurrence. The Latarjet

*Address correspondence to Eoghan T. Hurley, MB, BCh, Sports Surgery Clinic, Mornington House, Sandycove, Dublin, Ireland (email: eoghanhurley@rcsi.ie).
†Sports Surgery Clinic, Dublin, Ireland.
‡Royal College of Surgeons in Ireland, Department of Trauma & Orthopaedic Surgery, Dublin, Ireland.
§Hospital for Special Surgery, New York, New York, USA.

The authors declared that they have 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.

The American Journal of Sports Medicine
2019;47(12):3002–3008
DOI: 10.1177/0363546519831005

procedure has been shown to provide similar rates of return to play compared with arthroscopic or open soft tissue techniques, although few studies have directly compared the techniques.[8,9,16,27,28,32,44,53] However, no concise review of the literature is yet available regarding the rates and timing of return to play after the Latarjet procedure. Additionally, no validated criteria for safe return to play after the Latarjet procedure are available.

Therefore, the purpose of this study was to systematically review the evidence in the literature to ascertain the rate and timing of return to play and the availability of specific criteria for safe return to play after the Latarjet procedure. Our hypothesis was that the Latarjet procedure would result in high rates of return to play but that criteria for return to play would be scantly reported.

METHODS

Study Selection

The literature search was performed by 2 authors (C.M., M.S.J.), who used PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and reviewed the search results; a senior author (L.P.) arbitrated on any disagreement.[39] The titles and abstracts identified in the search were screened, and potentially eligible studies received a full-text review.

Search Strategy

The following search terms were used in MEDLINE, EMBASE, and the Cochrane Library databases in May 2018 as the search algorithm: (Latarjet OR open Latarjet OR arthroscopic Latarjet OR Latarjet procedure OR Bristow OR open Bristow OR Bristow procedure OR Bristow-Latarjet). No time limit was given to publication date.

Eligibility Criteria

The inclusion criteria were the following: (1) clinical study on the open Latarjet procedure, (2) report on return to play, (3) published in a peer-reviewed journal, and (4) published in English. The exclusion criteria were the following: (1) review studies, (2) cadaveric studies, (3) biomechanical studies, and (4) abstract only.

Data Extraction and Analysis

The relevant information regarding the study characteristics, including the study design, the level of evidence (LOE), the methodological quality of evidence (MQOE), the population, clinical outcome measures, and the follow-up time points, was collected by 2 blinded reviewers (C.M., M.S.J.) using a predetermined data sheet, with the results compared by a third independent reviewer (L.P.).

The LOE was evaluated based on the guidelines by the Oxford Centre for Evidence-Based Medicine. The MQOE was evaluated by use of a modified Coleman methodology score.[20] Studies were considered excellent quality if they scored 85-100, good quality if they scored 70-84, fair quality if they scored 55-69, and poor quality if they scored less than 55. The criteria for quality of return to play were based on the previously published criteria of Zaman et al.[52] These criteria consisted of return to play timeline, conditional criteria, measurement of conditional criteria, and rehabilitation protocol (timeline of immobilization postoperatively). A score of 4 indicated well-defined return to play criteria, a score of 1-3 indicated poorly defined criteria, and a score of 0 indicated no criteria.

Clinical outcomes extracted and analyzed were (1) overall rate of return to play and return to previous levels, including overall rate, rate among collision athletes, and rate among overhead athletes; (2) time of return to play; and (3) return to play criteria.

Statistics

Quantitative statistical analysis was performed by use of SPSS (IBM Corp).

RESULTS

Literature Search

The initial literature search resulted in 771 total studies. After removal of duplicates, the articles were screened for inclusion and exclusion criteria, and 516 unique studies were evaluated and full texts were assessed for eligibility. This review included 36 clinical studies[‖] (Figure 1).

Study Characteristics and Patient Demographics

Our review found 36 studies including 2134 cases that met our inclusion criteria.[‖] The mean MQOE of the studies was 62.4. The majority of patients were male (86.9%), with a mean age of 25.4 years (range, 14-69 years) and a mean follow-up of 83.5 months. The study characteristics and patient demographics are shown in Table 1.

Return to Play

The overall rate of return to play was 88.8%, with 72.6% of athletes returning to the same level of play. Among collision athletes, the overall rate of return to play was 88.2%, with 69.5% returning to the same level of play. In overhead athletes, the overall rate of return to play was 90.3%, with 80.6% returning to the same level of play. The mean time of return to play was 5.8 months (range, 3.2-8 months) (Table 2).

[‖]References 2, 4-11, 13-16, 19, 22-27, 32-36, 38, 40-43, 45, 46, 48-51, 53.

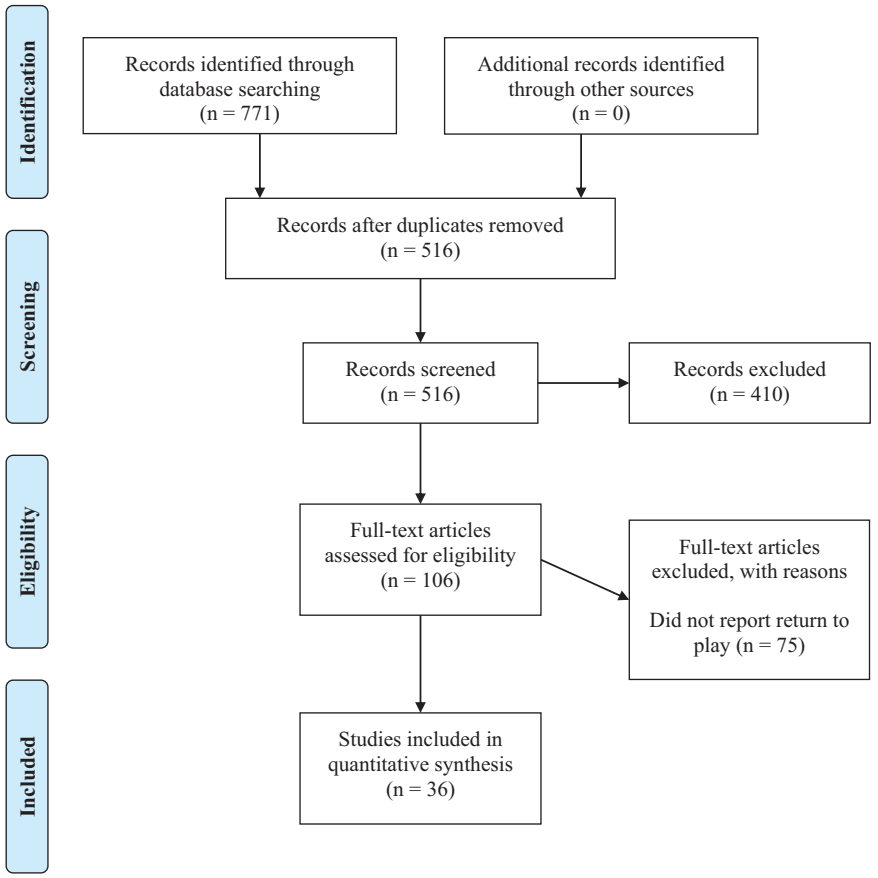

Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) study selection flow diagram.

Return to Play Criteria

The overall return to play criteria were reported in the majority of the studies (69.4%); time to return to sport was the most commonly reported item (66.7%). A wide discrepancy was found in reported time of return, ranging from 3 to 6 months, with 3 months being the most commonly used time point (35.4%). Other criteria, including computed tomography imaging to assess bone union (25%), clinical examination or decision (11.1%), strength (11.1%), pain (8.3%), and range of motion (5.6%), were less commonly reported. The mean score for quality of return to play criteria was 2.2 (range, 0-4) (Table 3).

DISCUSSION

The most important finding of the present study was that the Latarjet procedure for the treatment of anterior shoulder instability provided a high overall rate of return to play. Additionally, a high rate of return to sport was found among collision and overhead athletes. However, despite the high overall rate of return to sport, a considerable number of patients were not able to return to previous levels of play. Only scant criteria for safe return to play were identified in the literature. The most commonly reported criteria were based on timing, but several studies reported the use of computed tomography scans to evaluate bony union and allow for safe return with a potentially lower risk of recurrence.

The overall rate of return to play was high after the Latarjet procedure. The current study found an 89% rate of return to play. This is in contrast to the findings of other systematic reviews: Ialenti et al[31] reported a 73% rate of return to play among 353 patients in 6 studies, and Abdul-Rassoul et al[1] reported a rate of 81% among 205 patients in 5 studies. Thus, the rate of return to play may be higher than previously reported in systematic reviews in the literature. The difference in the search terms used may account for this, as the previous studies specify return to sports terms linked with shoulder stabilization terms, which may limit the search to studies with sports terms in the keywords, whereas we used a broad search strategy incorporating all studies on the Latarjet procedure. However, the rate of athletes returning to the same level of play was lower at 74%, meaning that of those athletes returning, approximately 20% were not able to achieve their preoperative level of play. The cause for this is likely multifactorial and harder to quantify: Besides the inability to return to sports at the desired level due to

TABLE 1
Study Characteristics and Patient Demographics[a]

Lead Author	Year	No. of Patients (Shoulders)	LOE	MQOE	RTPQ	Male, n	Age, y, mean (range)	Follow-up, mo, mean (range)
Allain[2]	1998	56 (58)	4	56	1	43	28 (15-58)	172 (120-276)
Aurich[4]	2015	6 (6)	4	58	1	5	27 (23-41)	36 (36)
Banas[5]	1993	71 (79)	4	71	1	63	22 (16-42)	103 (24-164)
Baverel[6]	2018	106 (110)	3	66	4	88	22 (16-30)	46 (25-86)
Beranger[7]	2016	47 (47)	4	67	2	46	28 (18-46)	46.8 (NR)
Bessière[8]	2014	90 (93)	3	68	2	89	26 (16-46)	72 (48-120)
Blonna[9]	2016	30 (30)	3	70	2	26	32 (19-45)	64 (24-108)
Bohu[10]	2016	46 (46)	3	56	0	41	25 (NR)	18.5 (12+)
Bonnevialle[11]	2013	11 (11)	4	56	2	9	31 (19-45)	40 (24-65)
Bouju[13]	2014	68 (70)	4	69	0	48	27 (NR)	156 (120-180)
Burkhart[14]	2007	47 (47)	4	71	4	46	27 (16-41)	59 (32-108)
Cerciello[15]	2012	26 (28)	4	58	4	26	21 (15-32)	85 (5-180)
Cho[16]	2016	35 (35)	3	57	2	32	28 (18-50)	30 (19-48)
Colegate-Stone[19]	2015	56 (56)	4	57	3	50	24 (16-42)	12 (NR)
Da Silva[22]	2015	51 (52)	4	62	1	42	31 (15-59)	22 (12-66)
Dauzère[23]	2016	68 (68)	4	67	2	67	26 (16-40)	21 (4-60)
De L'Escalopier[24]	2018	20 (20)	4	49	0	20	27 (NR)	196 (180-288)
Doursounian[25]	2009	34 (34)	4	62	1	31	32 (20-58)	24 (NR)
Edouard[26]	2010	20 (20)	4	59	3	20	27 (19-45)	21 (NR)
Hovelius[27]	2004	113 (118)	4	66	1	95	27 (15-57)	182 (172-250)
Jeon[32]	2018	31 (31)	3	63	2	26	27.4 (NR)	28.9 (24-73)
Kawasaki[33]	2018	152 (176)	4	71	4	NR	19 (18-19)	52 (47-56)
Kee[34]	2018	56 (58)	4	70	2	54	27 (18-43)	67 (24-113)
Khan[35]	2014	26 (28)	3	50	0	21	16 (NR)	116 (NR)
Lädermann[36]	2013	117 (117)	3	65	2	82	28 (16-55)	194 (120-266)
Mizuno[38]	2014	60 (68)	4	66	4	49	29 (16-58)	240 (216-264)
Mook[40]	2016	38 (38)	4	52	2	33	26 (16-43)	38 (24-95)
Neyton[41]	2012	34 (37)	4	59	4	34	23 (17-33)	144 (68-237)
Privitera[42]	2018	73 (73)	4	70	4	64	26 (15-54)	52 (24-120)
Ranalletta[43]	2018	65 (65)	4	80	3	63	27 (17-35)	44 (24-108)
Tasaki[45]	2015	38 (40)	4	62	4	37	21 (17-25)	31 (24-42)
Vadalà[46]	2017	24 (24)	4	49	0	22	27 (18-46)	24 (24)
Yamashita[48]	2002	126 (126)	4	61	2	100	25 (14-69)	41 (24-72)
Yang[49]	2016	52 (54)	3	58	4	41	22 (15-40)	42 (24-120)
Yoneda[50]	1999	83 (85)	4	58	4	70	21 (16-46)	70 (24-144)
Zimmermann[53]	2016	93 (93)	3	68	2	82	31 (NR)	119 (NR)

[a]LOE, level of evidence, MQOE, methodological quality of evidence; NR, not reported; RTPQ, quality of return to play criteria.

TABLE 2
Return to Play (RTP) Outcomes

Outcome	No. of Studies	Result, % (n/N)
Total RTP	32	88.8 (1463/1650)
RTP at same or higher level	31	72.6 (1122/1527)
Total RTP for collision athletes	12	88.2 (591/670)
RTP at same or higher level for collision athletes	11	69.5 (401/577)
Total RTP for overhead athletes	2	90.3 (28/31)
RTP at same or higher level for overhead athletes	2	80.6 (25/31)

physical limitations after shoulder dislocation and stabilization surgery, changes in lifestyle (eg, decision to end participation in nonprofessional collision sports or stepping down levels of competition) and fear of injury despite physical ability potentially influence reported rates of return to play. Future research should include analysis of the decisive factors for nonreturn to the preinjury level of sports when reporting on rates of return to play.

These results compare favorably with those of other systematic reviews evaluating other surgical treatment

TABLE 3
Return to Play Criteria

Criteria	n (%)
Overall	25 (69.4)
Time	24 (66.7)
Time, collision athletes and noncollision athletes	5 (13.9)
Imaging	9 (25.0)
Clinical examination and decision	4 (11.1)
Strength	4 (11.1)
Pain	3 (8.3)
Full range of motion	2 (5.6)

options for anterior shoulder instability. In a recent systematic review, Memon et al[37] found that 81% of athletes returned to play after arthroscopic Bankart repair, with 66% returning to previous levels of play. Few studies have directly compared Bankart and Latarjet procedures; those studies conducting such comparisons have not found a significant difference between these techniques, although the overall pooled rate of return to play is slightly higher with the open Latarjet procedure (83.5% vs 70.3%).[8,9,32,53] Similarly, randomized controlled trials have found similar rates of return for open and arthroscopic Bankart repairs.[12,18] Additionally, the timing of return was approximately 5 months, which could be slightly advantageous over soft tissue repairs, as the time taken for bone healing may be faster than that for soft tissue healing. Memon et al[37] found a mean time of return to play of approximately 8 months after arthroscopic Bankart repairs, which may support this theory. However, the injuries and rationale for treatment with each surgical option may differ between those treated with Bankart repairs and the Latarjet procedure, which makes comparison difficult.[53]

A high rate of return to sport was found among collision and overhead athletes. Multiple studies have evaluated the outcomes of the Latarjet procedure in collision athletes and found high rates of return with low recurrence rates.[¶] These findings indicate that the Latarjet procedure is a reliable procedure in collision athletes.[¶] In contrast, only a few studies exist reporting on outcomes of overhead athletes, which might represent a concern in performing a nonanatomic procedure that may limit range of motion or have negative implications for throwing mechanics in this population.[9] Nonetheless, the available studies show that the Latarjet procedure presents a reliable treatment option in overhead athletes with high rates of return to play at all levels.

Despite the generally high rate of return to sports, the review of the literature revealed that not everybody can return at the preinjury level. This is an often overlooked but very important point when counseling patients, and often their parents, especially for high-demand populations such as collision or overhead athletes, where up to 30% of patients are expected to not return to their preinjury level of sport.

[¶]References 2, 14, 21, 26, 27, 41-43, 45, 48, 50.

The majority of included studies reported rather generic criteria for return to play, with the majority being time-based criteria, most commonly 3 months. Validated return to play criteria could potentially help reduce the rate of recurrence after return to play. The use of imaging modalities such as computed tomography to assess bony union might be an interesting indicator for return to play but might not be feasible in every clinical setting and can only work in conjunction with clinical criteria. Ciccotti et al[17] previously identified criteria for return to play after the surgical management of traumatic anterior shoulder instability, although their study focused primarily on soft tissue injuries and repairs. Development of a validated checklist for safe return to play after the Latarjet procedure would be of great interest, with the potential to significantly improve patient outcomes.

Further study is needed regarding return to play outcomes after the Latarjet procedure, particularly comparing the outcomes with other methods of shoulder stabilization. No study has compared the timing of return to play between the Latarjet and Bankart procedures. Additionally, prospective literature is lacking comparing the Latarjet or Bankart procedures with the various bone block procedures available today. The Latarjet procedure is most commonly performed via an open approach; however, interest in performing the Latarjet arthroscopically is increasing.[30] Although studies have shown an improved pain recovery time for arthroscopic Latarjet, due to the minimally invasive approach, no data are available regarding how this translates to return to play time or how the 2 techniques compare in that regard. To our knowledge, no study has evaluated the rate or timing of return to play after the arthroscopic Latarjet procedure.

Limitations

This study has potential limitations and sources of biases, including the limitations of the included studies themselves. The majority of studies provided uncontrolled level 4 evidence, which may introduce potential selection bias. Due to reporting limitations in the included studies, we were not able to analyze demographic factors as potential risk factors for inability to return to play. Finally, the term *Latarjet procedure* is typically colloquially used in place of *coracoid transfer*, the latter of which may be more correct. Similarly, variations in the Latarjet technique and its eponymous use may affect the outcome.[21]

CONCLUSION

The overall rate of return to play was reportedly high after the Latarjet procedure. However, almost a fifth of athletes returning to sports were not able to return at the same level. Further development of validated criteria for safe return to sports could potentially improve clinical outcomes and reduce recurrence rates.

REFERENCES

1. Abdul-Rassoul H, Galvin JW, Curry EJ, Simon J, Li X. Return to sport after surgical treatment for anterior shoulder instability: a systematic review [published online June 1, 2018]. *Am J Sports Med*. doi:10.1177/0363546518780934
2. Allain J, Goutallier D, Glorion C. Long-term results of the Latarjet procedure for the treatment of anterior instability of the shoulder. *J Bone Joint Surg Am*. 1998;80(6):841-852.
3. An VVG, Sivakumar BS, Phan K, Trantalis J. A systematic review and meta-analysis of clinical and patient-reported outcomes following two procedures for recurrent traumatic anterior instability of the shoulder: Latarjet procedure vs. Bankart repair. *J Shoulder Elbow Surg*. 2016;25(5):853-863.
4. Aurich M, Hofmann GO, Gras F. Reconstruction of the coracoacromial ligament during a modified Latarjet procedure: a case series. *BMC Musculoskelet Disord*. 2015;16:238.
5. Banas MP, Dalldorf PG, Sebastianelli WJ, DeHaven KE. Long-term followup of the modified Bristow procedure. *Am J Sports Med*. 1993;21(5):666-671.
6. Baverel L, Colle PE, Saffarini M, Anthony Odri G, Barth J. Open Latarjet procedures produce better outcomes in competitive athletes compared with recreational athletes: a clinical comparative study of 106 athletes aged under 30 years. *Am J Sports Med*. 2018;46(6):1408-1415.
7. Beranger JS, Klouche S, Bauer T, Demoures T, Hardy P. Anterior shoulder stabilization by Bristow-Latarjet procedure in athletes: return-to-sport and functional outcomes at minimum 2-year follow-up. *Eur J Orthop Surg Traumatol*. 2016;26(3):277-282.
8. Bessière C, Trojani C, Carles M, Mehta SS, Boileau P. The open Latarjet procedure is more reliable in terms of shoulder stability than arthroscopic Bankart repair. *Clin Orthop Relat Res*. 2014;472(8):2345-2351.
9. Blonna D, Bellato E, Caranzano F, Assom M, Rossi R, Castoldi F. Arthroscopic Bankart repair versus open Bristow-Latarjet for shoulder instability: a matched-pair multicenter study focused on return to sport. *Am J Sports Med*. 2016;44(12):3198-3205.
10. Bohu Y, Klouche S, Gerometta A, Herman S, Lefevre N. Outpatient Latarjet surgery for gleno-humeral instability: prospective comparative assessment of feasibility and safety. *Orthop Traumatol Surg Res*. 2016;102(4):507-512.
11. Bonnevialle N, Ibnoulkhatib A, Mansat P, Rongières M, Mansat M, Bonnevialle P. Outcomes of two surgical revision techniques for recurrent anterior shoulder instability following selective capsular repair. *Orthop Traumatol Surg Res*. 2013;99(4):455-463.
12. Bottoni CR, Smith EL, Berkowitz MJ, Towle RB, Moore JH. Arthroscopic versus open shoulder stabilization for recurrent anterior instability: a prospective randomized clinical trial. *Am J Sports Med*. 2006;34(11):1730-1737.
13. Bouju Y, Gadéa F, Stanovici J, Moubarak H, Favard L. Shoulder stabilization by modified Latarjet-Patte procedure: results at a minimum 10 years' follow-up, and role in the prevention of osteoarthritis. *Orthop Traumatol Surg Res*. 2014;100(suppl 4):S213-S218.
14. Burkhart SS, De Beer JF, Barth JRH, Criswell T, Roberts C, Richards DP. Results of modified Latarjet reconstruction in patients with anteroinferior instability and significant bone loss. *Arthroscopy*. 2007;23(10):1033-1041.
15. Cerciello S, Edwards TB, Walch G. Chronic anterior glenohumeral instability in soccer players: results for a series of 28 shoulders treated with the Latarjet procedure. *J Orthop Traumatol*. 2012;13:197-202.
16. Cho NS, Yoo JH, Rhee YG. Management of an engaging Hill–Sachs lesion: arthroscopic emplissage with Bankart repair versus Latarjet procedure. *Knee Surg Sports Traumatol Arthrosc*. 2016;24(12):3793-3800.
17. Ciccotti MC, Syed U, Hoffman R, Abboud JA, Ciccotti MG, Freedman KB. Return to play criteria following surgical stabilization for traumatic anterior shoulder instability: a systematic review. *Arthroscopy*. 2018;34(3):903-913.
18. Cole BJ, L'Insalata J, Irrgang J, Warner JJ. Comparison of arthroscopic and open anterior shoulder stabilization: a two to six-year follow-up study. *J Bone Joint Surg Am*. 2000;82(8):1108-1114.
19. Colegate-Stone TJ, Van der Watt C, de Beer JF. Evaluation of functional outcomes and complications following modified Latarjet reconstruction in athletes with anterior shoulder instability. *Shoulder Elbow*. 2015;7(3):168-173.
20. Coleman BD, Khan KM, Maffulli N, Cook JL, Wark JD. Studies of surgical outcome after patellar tendinopathy: clinical significance of methodological deficiencies and guidelines for future studies. Victorian Institute of Sport Tendon Study Group. *Scand J Med Sci Sports*. 2000;10(1):2-11.
21. Cowling PD, Akhtar MA, Liow RY. What is a Bristow-Latarjet procedure? A review of the described operative techniques and outcomes. *Bone Joint J*. 2016;98(9):1208-1214.
22. Da Silva LA, Da Costa Lima AG, Kautsky RM, Santos PD, Do Val Sella G, Checchia SL. Evaluation of the results and complications of the Latarjet procedure for recurrent anterior dislocation of the shoulder. *Rev Bras Ortop*. 2015;50(6):652-659.
23. Dauzère F, Faraud A, Lebon J, Faruch M, Mansat P, Bonnevialle N. Is the Latarjet procedure risky? Analysis of complications and learning curve. *Knee Surg Sports Traumatol Arthrosc*. 2016;24(2):557-563.
24. De L'Escalopier N, Barbier O, Demoures T, Ollat D, Versier G. Long-term results of a monocentric series of soldiers after Latarjet procedure for anterior shoulder instability: implications for the assessment of soldiers' medical ability. *Mil Med*. 2018;183(1-2):e134-e137.
25. Doursounian L, Debet-Mejean A, Chetboun A, Nourissat G. Bristow-Latarjet procedure with specific instrumentation: study of 34 cases. *Int Orthop*. 2009;33(4):1031-1036.
26. Edouard P, Beguin L, Fayolle-Minon I, Degache F, Farizon F, Calmels P. Relationship between strength and functional indexes (Rowe and Walch-Duplay scores) after shoulder surgical stabilization by the Latarjet technique. *Ann Phys Rehabil Med*. 2010;53(8):499-510.
27. Hovelius L, Sandstrom B, Sundgren K, Saebo M. One hundred eighteen Bristow-Latarjet repairs for recurrent anterior dislocation of the shoulder prospectively followed for fifteen years: study I—clinical results. *J Shoulder Elbow Surg*. 2004;13(5):509-516.
28. Hovelius L, Vikerfors O, Olofsson A, Svensson O, Rahme H. Bristow-Latarjet and Bankart: a comparative study of shoulder stabilization in 185 shoulders during a seventeen-year follow-up. *J Shoulder Elbow Surg*. 2011;20(7):1095-1101.
29. Hurley ET, Jamal MS, Ali ZS, Montgomery C, Pauzenberger L, Mullett H. Long-term outcomes of the Latarjet procedure for anterior shoulder instability—a systematic review of studies at 10-year follow-up. *J Shoulder Elbow Surg*. 2019;28(2):e33-e39.
30. Hurley ET, Lim Fat D, Farrington SK, Mullett H. Open versus arthroscopic Latarjet procedure for anterior shoulder instability:

a systematic review and meta-analysis [published online March 1, 2018]. *Am J Sports Med*. doi:10.1177/0363546518759540
31. Ialenti MN, Mulvhill JD, Feinstein M, Zhang AL, Feeley BT. Return to play following shoulder stabilization: a systematic review and meta-analysis. *Orthop J Sports Med*. 2017;5(9):2325967117726055.
32. Jeon YS, Jeong HY, Lee DK, Rhee YG. Borderline glenoid bone defect in anterior shoulder instability: Latarjet procedure versus Bankart repair. *Am J Sports Med*. 2018;46(9):2170-2176.
33. Kawasaki T, Hasegaway Y, Kaketay T, et al. Midterm clinical results in rugby players treated with the Bristow procedure. *Am J Sports Med*. 2018;46(3):656-662.
34. Kee YM, Kim JY, Kim HJ, Lim CT, Rhee YG. Return to sports after the Latarjet procedure: high return level of noncollision athletes. *Knee Surg Sports Traumatol Arthrosc*. 2018;26(3):919-925.
35. Khan A, Samba A, Pereira B, Canavese F. Anterior dislocation of the shoulder in skeletally immature patients: comparison between non-operative treatment versus open Latarjet's procedure. *Bone Joint J*. 2014;96(3):354-359.
36. Lädermann A, Lubbeke A, Stern R, Cunningham G, Bellotti V, Gazielly DF. Risk factors for dislocation arthropathy after Latarjet procedure: a long-term study. *Int Orthop*. 2013;37(6):1093-1098.
37. Memon M, Kay J, Cadet ER, Shahsavar S, Simunovic N, Ayeni OR. Return to sport following arthroscopic Bankart repair: a systematic review. *J Shoulder Elbow Surg*. 2018;27(7):1342-1347.
38. Mizuno N, Denard PJ, Raiss P, Melis B, Walch G. Long-term results of the Latarjet procedure for anterior instability of the shoulder. *J Shoulder Elbow Surg*. 2014;23(11):1691-1699.
39. Moher D, Liberati A, Tetzlaff J, Mulrow C, Altman DG; PRISMA Group. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *Int J Surg*. 2010;44:336-341.
40. Mook WR, Petri M, Greenspoon JA, Horan MP, Dornan GJ, Millett PJ. Clinical and anatomic predictors of outcomes after the Latarjet procedure for the treatment of anterior glenohumeral instability with combined glenoid and humeral bone defects. *Am J Sports Med*. 2016;44(6):1407-1416.
41. Neyton L, Young A, Dawidziak B, et al. Surgical treatment of anterior instability in rugby union players: clinical and radiographic results of the Latarjet-Patte procedure with minimum 5-year follow-up. *J Shoulder Elbow Surg*. 2012;21(12):1721-1727.
42. Privitera DM, Sinz NJ, Miller LR, et al. Clinical outcomes following the Latarjet procedure in contact and collision athletes. *J Bone Joint Surg Am*. 2018;100(6):459-465.
43. Ranalletta M, Rossiy LA, Bertona A, et al. Modified Latarjet without capsulolabral repair in rugby players with recurrent anterior glenohumeral instability and significant glenoid bone loss. *Am J Sports Med*. 2018;46(4):795-800.
44. Russo R, Rotonda GD, Cautiero F, et al. Arthroscopic Bankart repair associated with subscapularis augmentation (ASA) versus open Latarjet to treat recurrent anterior shoulder instability with moderate glenoid bone loss: clinical comparison of two series. *Musculoskelet Surg*. 2017;101(1):75-83.
45. Tasaki A, Morita W, Yamakawa A, et al. Combined arthroscopic Bankart repair and coracoid process transfer to anterior glenoid for shoulder dislocation in rugby players: evaluation based on ability to perform sport-specific movements effectively. *Arthroscopy*. 2015;31(9):1693-1701.
46. Vadalà A, Lanzetti RM, De Carli A, et al. Latarjet procedure: evolution of the bone block and correspondent clinical relevance—a clinical and radiological study. *Musculoskelet Surg*. 2017;101(suppl 2):113-120.
47. Warth RJ, Briggs KK, Dornan GJ, Horan MP, Millett PJ. Patient expectations before arthroscopic shoulder surgery: correlation with patients' reasons for seeking treatment. *J Shoulder Elbow Surg*. 2013;22(12):1676-1681.
48. Yamashita T, Okamura K, Hotta T, Wada T, Aoki M, Ishii S. Good clinical outcome of combined Bankart-Bristow procedure for recurrent shoulder instability: 126 patients followed for 2-6 years. *Acta Orthop Scand*. 2002;73(5):553-557.
49. Yang JS, Mazzocca AD, Cote MP, Edgar CM, Arciero RA. Recurrent anterior shoulder instability with combined bone loss. *Am J Sports Med*. 2016;44(4):922-932.
50. Yoneda M, Hayashida K, Wakitani S, Nakagawa S, Fukushima S. Bankart procedure augmented by coracoid transfer for contact athletes with traumatic anterior shoulder instability. *Am J Sports Med*. 1999;27(1):21-26.
51. Zaffagnini S, Marcheggiani Muccioli GM, Giordano G, et al. Long-term outcomes after repair of recurrent post-traumatic anterior shoulder instability: comparison of arthroscopic transglenoid suture and open Bankart reconstruction. *Knee Surg Sports Traumatol Arthrosc*. 2012;20(5):816-821.
52. Zaman S, White A, Shi WJ, Freedman KB, Dodson CC. Return-to-play guidelines after medial patellofemoral ligament surgery for recurrent patellar instability: a systematic review. *Am J Sports Med*. 2018;46(10):2530-2539.
53. Zimmermann SM, Scheyerer MJ, Farshad M, Catanzaro S, Rahm S, Gerber C. Long-term restoration of anterior shoulder stability: a retrospective analysis of arthroscopic Bankart repair versus open Latarjet procedure. *J Bone Joint Surg Am*. 2016;98(23):1954-1961.