Failed Latarjet surgery: why, how, and what next?

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**Article info**

**Keywords:**
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**Level of evidence:** Level IV; Case Series; Treatment Study

**Background:** The Latarjet procedure is an established and popular procedure for recurrent anterior shoulder instability; however, to our knowledge, few studies have reported on the outcomes of revision for failed Latarjet surgery. We reviewed the causes and management of recurrent instability after previous Latarjet stabilization surgery. The outcomes of revision surgery were also evaluated.

**Methods:** A retrospective analysis of prospective data in patients undergoing revision surgery after failed Latarjet stabilization was conducted. Data were collected over a 5-year period and included patient demographics, clinical presentation, cause of recurrent instability, indications for revision surgery, intraoperative analysis, outcomes of revision surgery, and return to sport.

**Results:** We identified 16 patients (12 male and 4 female patients) who underwent revision surgery for recurrent instability after Latarjet stabilization. Of these patients, 11 were athletes: 9 professional and 2 amateur athletes. The mean age at revision was 29.9 ± 8.9 years (range, 17-50 years). The indications for revision were anterior instability in 11 patients, posterior instability in 4, and both anterior and posterior instability in 1. Of the anterior instability cases, 54.5% were due to coracoid nonunion and 36.4% were due to capsular failure (retrac). All posterior instability cases had posterior capsulolabral injuries, and the mean Beighton score in this group was 6 or higher. One patient had a failed Latarjet procedure with coracoid nonunion and a posterior labral tear.

**Conclusion:** Coracoid nonunion was the most common cause of recurrence after Latarjet stabilization, requiring an Eden-Hybinette procedure. The patients who returned with posterior instability had a high incidence of hypermobility and could be treated successfully by arthroscopic techniques.

Shoulder instability, particularly anterior instability, affects 24 per 100,000 persons in the population annually, with increased incidences recorded in men, contact athletes, and military personnel—particularly in the second and third decades of life.1,2,3 The principles of the current Latarjet procedure were described in 1954 by André Latarjet in Lyon, France.4 It is predominantly used when recurrent anterior shoulder instability is associated with osseous glenoid defects.5 The effectiveness of this procedure is largely attributed to a triad of (1) the conjoint tendon acting as a sling on the inferior subscapularis and capsule, (2) increased anteroposterior glenoid diameter, and (3) the effect of repairing the capsule to the stump of the conjoint tendon.6 Over the past few decades, this procedure has been modified several times.7

Many studies have established the effectiveness of the Latarjet procedure for recurrent anterior shoulder instability.1,2,3,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32 Although the success rates of the Latarjet procedure are high, recurrent instability can occur. Earlier studies demonstrated recurrence and reoperation rates of 10% and 14%, respectively.20 More recently, these findings have improved, with redislocation and subluxation rates of 2.9% and 5.8%, respectively.11 We published our results of primary Latarjet procedures, showing a 5% complication rate overall.12 Subsequent revision surgery is compromised by the presence of scar tissue obscuring normal tissue planes and fragile anatomic bone and soft tissue structures.13 Young and Rockwood9 stated that revision surgical procedures have a low success rate and should not be performed. Furthermore, the use of screws close to the glenohumeral joint (GHJ) has been associated with damage to the...
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Materials and methods

We present a case series of data prospectively collected over a
5-year period. A total of 16 patients who had undergone revision
surgery after failed Latarjet stabilization were identified. Revision
surgery was defined as the index procedure after the failed Latarjet
operation. The senior author performed 8 of the primary Latarjet
procedures, whereas the other 8 came from other institutions. The
senior author performed all revision procedures.

Demographic data included age, sex, sport, and occupation. Data
on the indication for revision, type of revision surgery, intra-
operative findings at revision surgery, outcomes of revision, and
return to sport were recorded. Intraoperative examination of the
GHJ included analysis of capsular laxity, osteoarthritis, and tissue
quality. Poor tissue quality was defined as any documented evi-
dence of substantial scarring; hyperproliferation; or atrophy of the
capsule, synovium, muscle and/or soft tissue, and bone (excluding
osteoarthritides). Data were also analyzed in those patients who un-
derwent a second revision after a failed first revision procedure.

Results

We identified a total of 16 patients who underwent at least 1
revision procedure after failed Latarjet stabilization, comprising 12
male and 4 female patients. The mean age at initial Latarjet stabi-
lation was 27.4 ± 6.7 years (range, 16-41 years). The mean age at
revision surgery was 29.9 ± 8.9 years (range, 17-50 years). There
were 9 right and 7 left shoulders. Arm dominance was reported in 7
patients, with the dominant arm affected in 4. Of the patients, 11
were athletes: 9 professional and 2 amateur athletes. The profes-
sional athletes comprised 6 rugby players, 2 soccer players, and 1
downhill mountain biker. One amateur athlete played a combina-
tion of cricket and rugby; the second was an equestrian.

In 11 cases, the initial Latarjet procedure was performed via an
open approach (Cape Town technique in 10 and French technique in
1), and in 1 case, an arthroscopic approach was used. In 4 cases, the

| Table I |
| --- |
| Postoperative rehabilitation protocol |

| Day 1 to 3 wk: level 1 exercises |
| --- |
| Sling for 3 wk (athletes can wean off sooner under guidance of club therapist) |
| Teach axillary hygiene |
| Teach postural awareness and scapular setting |
| Core stability exercises (as appropriate) |
| Proprioceptive exercises (minimal weight bearing < 90°) |
| Active-assisted flexion as comfortable (in “safe zone”) |
| Active-assisted external rotation as comfortable (in safe zone) |

| 3-6 wk: level 2-3 exercises |
| --- |
| Mean off sling |
| Progress from active-assisted to active ROM as comfortable |
| Do not force or stretch |
| No combined abduction and external rotation |

| 6-12 wk: progress level 3+ exercises |
| --- |
| Regain scapular and glenohumeral stability working for shoulder joint control |
| Gradually increase ROM |
| Strengthen |
| Increase proprioception through open and closed chain exercise |
| Progress core stability exercises |
| Ensure and treat posterior tightness, if required |
| Incorporate sports-specific rehabilitation |
| Plyometrics and perturbation training |

ROM, range of movement.

Complications

Postoperative complications developed in a total of 4 patients
(mean age, 39 years; age range, 32-48 years) after primary revision
surgery. Of these complications, 2 occurred after Eden-Hybinette
revision, 1 occurred secondary to arthroscopic stabilization, and 1
occurred secondary to an arthroscopic remplissage procedure.

In the case of failure secondary to arthroscopic stabilization, a
persistently painful and stiff shoulder developed. The patient
underwent arthroscopy, during which he was found to have a
low-grade infection. He was treated with arthroscopic washout,
debridement, and antibiotic therapy. Biopsy findings confirmed
Cutibacterium acnes infection. We previously published a detailed
study highlighting the diagnostic techniques used in identifying
low-grade organisms. 

In 1 of the 2 cases of Eden-Hybinette revision, recurrent insta-

group (54.5%, n = 6), followed by capsular failure with a well-
healed coracoid graft (36.4%, n = 4) (Table II). All cases of poste-
or instability had posterior labral and/or capsular injury, as well
as generalized hypermobility. The revision procedures performed
are summarized in Table II. The mean time to revision surgery was
61 ± 50 weeks (range, 15-185 weeks). The Eden-Hybinette pro-
cedure (tricortical iliac crest bone graft) was the most common
revision procedure for recurrent anterior instability. Arthroscopic
stabilization was the most common procedure for posterior
stability.

At revision surgery, the GHJ was assessed for capsular laxity.
Capsular laxity was a common finding intraoperatively (73.3%,
n = 11). All patients with posterior instability demonstrated pos-
terior labral tears and capsule laxity at revision surgery. In addi-
tion, all these patients had a Beighton score of 6 or higher.

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| In 1 of the 2 cases of Eden-Hybinette revision, recurrent insta- |
| (2 large fragmented screws, with lengths of 48 mm and 50 |
| mm) and a temporary ilioinguinal nerve injury developed. The graft |
| was well healed on computed tomography scan. No clinical sub- |
| scapularis insufficiency was noted, and electrodiagnostic studies |
| were not performed. Management was performed with specialist |
| shoulder rehabilitation that involved a sports-specific program for |
| this patient, and he improved. The nerve recovered also. |
In the other case of a failed Eden-Hybinette procedure, an infected graft fracture and screw failure (2 large fragmented screws, each with a length of 50 mm) developed. The patient underwent open removal of metalwork, debridement, washout, and antibiotic therapy. He had no pain or instability, and all options were discussed. The bone graft was left in situ, and we later inserted bone marrow aspirate concentrate under computed tomography guidance as first-line treatment because of the risks of revision surgery in patients with no symptoms. This patient went on to heal and return to play international-level rugby.

The patient with arthroscopic remplissage had a missed coracoid nonunion and subsequently underwent an Eden-Hybinette procedure. He was able to return to play international-level rugby.

Return to sport

Of the 11 athletes, 7 returned to the same level of sport. Both amateurs (100%) returned to sport compared with 5 professional athletes (55.6%).

Discussion

The Latarjet procedure has become an increasingly popular procedure for anterior shoulder instability, particularly in contact athletes. As the popularity of the procedure grows, so does the frequency of complications. Our case series is important as it is the first case series detailing coracoid nonunion as the leading cause of recurrent anterior instability after failed Latarjet stabilization, as well as detailing the risk of posterior instability after the Latarjet procedure in patients with hypermobility.

To our knowledge, only 1 previous study has reported on the outcomes of the Eden-Hybinette procedure for failed Latarjet stabilization surgery: Lunn et al assessed the outcomes of 34 patients after revision using a modified Eden-Hybinette technique. In their study, they highlighted that patients may still experience apprehension after revision, but this did not appear to be clinically significant. In addition, 68% of patients returned to the pre-dislocation level of sport. An important finding in our cohort was an 83.3% success rate at revision using the Eden-Hybinette technique, with only 1 patient requiring a further revision procedure.

Our study showed a 77.8% success rate (7 of 9 patients) when using an arthroscopic approach for revision surgery after failed Latarjet stabilization in selected patients in whom a soft tissue failure had occurred in the presence of a well-healed coracoid graft. This finding is similar to the results of Castagna et al, who showed a return to sports in 61% of their 17 cases. Our rate of athletes returning to the same level of sport was 64%.

In our study, we demonstrated a 100% success rate using arthroscopic posterior stabilization of posterior instability after a primary Latarjet procedure. This finding is in line with recently reported success rates of approximately 90% using arthroscopic techniques for primary posterior instability. It is important to note that these cases were recurrent traumatic sports injuries after a primary Latarjet procedure, all occurring rugby players, and not cases of missed posterior instability at the primary surgical procedure. All these patients had hypermobility with Beighton scores of 6 or higher. Our study highlights the risk of posterior injury in hypermobile contact athletes after the primary Latarjet procedure. We believe this is a result of the alteration in the balance of joint laxity after the Latarjet procedure, making the posterior stabilizing structures at higher risk of injury.

Our study has some limitations. First, it was a retrospective analysis of prospectively collected data from a single institution. Patient-reported outcome scores would have provided additional objective information, but these were not routinely collected during the study period. A single surgeon undertook all revision procedures to reduce inter-surgeon variability when performing intraoperative analysis of the shoulder joint. In addition, our study lacks sample multiplicity beyond N = 16. We hope the findings of this study highlight the importance of encouraging further work to be undertaken.

Conclusion

Coracoid nonunion was the most common cause of recurrent anterior instability after Latarjet stabilization. These patients are successfully treated by an Eden-Hybinette procedure with iliac crest bone graft, with a good return to sports. In selected cases in which there is only soft tissue failure with a healed coracoid graft, arthroscopic stabilization is a suitable revision technique. Hypermobile patients returning to contact sports are potentially at an increased risk of posterior instability following reinjury after primary Latarjet stabilization.

Disclaimer

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Table II

Mechanism of Latarjet failure and revision procedure performed

| Mechanism of failure | n (%) | Revision procedure |
|----------------------|------|--------------------|
| Anterior instability | 11 (69) | E-H |
| Coracoid nonunion    | 6 (38) | E-H |
| Screw failure        | 3 (19) | E-H |
| No screw failure     | 1 (6) | E-H |
| Screw failure and infection | 1 (6) | E-H |
| Capsular failure     | 4 (25) | AS in 3 and E-H in 1 |
| Hill-Sachs lesion    | 1 (6) | AR |
| Posterior instability| 4 (13) | E-H |
| Posterior labral tear and posterior capsular laxity | 3 (19) | AS |
| Capsular laxity      | 1 (6) | AS |
| Combined anterior and posterior instability | 1 (6) | E-H and AS |

E-H, Eden-Hybinette procedure; AS, arthroscopic stabilization; AR, arthroscopic remplissage.
