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RECURRENCE OF INSTABILITY AFTER THE LATARJET PROCEDURE

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NAWRÓT NIESTABILNOŚCI PO OPERACJACH METODĄ LATARJET

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SUMMARY

Introduction

The coracoid transfer (Latarjet procedure) is one of the most common procedures to treat shoulder instability. It has been proven to show high success rates in treatment, especially for cases of bone loss. However, the procedure bares a high risk of complications. The recurrence of instability following the coracoid transfer has been reported to make up 8.7%.

Aim, material and methods

The present paper is based on a literature review and a retrospective presentation of clinical cases aimed to illustrate the proposed options of treatment of recurrent instability following a failed coracoid transfer.

Results and conclusions

No strong recommendations can be made based on the limited literature. Yet, in the case of the recurrence of instability following the Latarjet procedure several options are available. The decision should be made based on clinical picture of the patient (severity of instability, epilepsy) and imaging (bone defects). The options include non-operative treatment (rehabilitation), soft tissue repair and reposition of reparable coracoid transfer or bone-block glenoid reconstruction.

STRESZCZENIE

Wprowadzenie

Transfer wyrostka (procedura Latarjet) jest jedną z najczęstszych procedur w leczeniu niestabilności barku. Udowodniono jej wysoką skuteczność w leczeniu, zwłaszcza w przypadkach ubytków kostnych. Jednakże procedura ta pociąga za sobą wysokie ryzyko powikłań. Nawrót niestabilności po transferze kości kruczej odnotowano w 8,7% przypadkach leczenia.

Cel, materiał i metody

Niniejszy artykuł oparty jest na przeglądzie literatury i retrospektywnej prezentacji przypadków klinicznych. Jego celem jest przedstawienie różnych opcji leczenia w przypadku nawrotu niestabilności po nieskutecznym transferze.

Wyniki i wnioski

Nie ma jednoznacznej i najlepszej metody leczenia a rekomendacje literaturowe są bardzo ograniczone. Jednak w przypadku ponownego wystąpienia niestabilności po zastosowaniu procedury Latarjet, istnieje kilka możliwości postępowania. Decyzja powinna podejmowana na podstawie obrazu klinicznego pacjenta (nasilenia niestabilności, padaczka) oraz wyniku obrazowania (ubytki kostne). Dostępne metody obejmują leczenie nieoperacyjne (rehabilitacja), naprawę tkanek miękkich i repozycję wyrostka kruczego i ponowną stabilizację lub rekonstrukcję kostną panewki za pomocą bloku kostnego.

Keywords: shoulder instability, surgery, Latarjet procedure, recurrent shoulder instability

Słowa kluczowe: niestabilność barku, zabiegi chirurgiczne, metoda Latarjet, nawracająca niestabilność barku

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Introduction

The coracoid transfer is one of the most common procedures to treat the shoulder instability. It has been used for primary indications, but it is commonly agreed that the best indication is instability with significant bone defects, especially affecting the glenoid. The procedure has a long history of predictable good results. However, it is also notorious for an increased risk of complications and technical difficulties.

Historically, there have been two almost simultaneous reports of the coracoid transfer. The first one, provided by Latarjet in 1954 was followed by Bristow's (reported by Helfet in 1956) (Walch and Boileau 2000). The original Latarjet procedure was performed with osteotomized coracoid transferred flat on the glenoid under the subscapularis tendon and fixed with one screw. Bristow in his technique would suture the coracoid tip into the glenohumeral capsule through the split in the subscapularis tendon.

The coracoid transfer (commonly known as the Latarjet or Bristow-Latarjet procedure) and its stabilizing mechanism have been described by Patte. The concept of triple blocking includes bone block (the coracoid transfer flat on the scapular neck with two screws), conjoined the tendon acting as a sling through the preserved inferior part of the subscapularis and the capsular shift suturing to the remaining part of the coraco-acromial ligament.

The Bristow-Latarjet procedure has a long history of reports, proving its reliability and effectiveness; however, what often scares surgeons – especially young ones – is the risk of complications (Balestro *et al.* 2015; Butt and Charalambous 2012; Di Giacomo

et al. 2011; Gordins *et al.* 2015; Hovelius *et al.* 2001, 2011, 2012; Omidi-Kashani *et al.* 2008; Lafosse and Boyle 2010; Longo *et al.* 2014). A recent systematic review by Griesser *et al.* (2013) has collected 45 studies reporting on complications and reoperations after original or modified versions of Bristow or Latarjet shoulder stabilization surgeries. The data collected comprise 1712 open and 177 arthroscopic procedures. The rate of complications found was as high as 30%. The authors have also found that the set of complications was quite unique for the procedure. The risk of reoperation amounted to 6.9%. The complications were as follows: coracoids-related (14.1% – fracture, lysis, non-union, fibrous-union), hardware-related (2.4%), neurovascular (1.8% – musculocutaneous nerve, axillary nerve, brachial artery), infection (1.5%), haematoma (1%), osteoarthritis and subscapularis rupture (1%).

One of the most important was the risk of the recurrence of instability following the coracoid transfer, which reached a stunning 8.7%.

Aim, material and methods

A review is based on a literature analysis on the topic and a retrospective presentation of clinical cases aimed to illustrate the proposed options of treatment of recurrent instability following a failed coracoid transfer.

Results

Clinical cases

Case I. Non-operative treatment of failed Latarjet procedure

The first case is a 33-year-old male working as a heavy labourer. He has suffered from

recurrent instability for the last 8 years with over 500 subluxations. Clinical tests revealed a typical positive apprehension that also limited his active elevation. Despite the instability, he remained very active in multiple sports. CT scan confirmed a significant glenoid defect with partly eroded bony Bankart (Figure 1a). The Latarjet procedure was performed (Figure 1 a-c). However, the patient experienced one subluxation 6 months after the procedure, which resulted in his sensation of apprehension. The patient then got involved in a thorough rehabilitation program which decreased the apprehension and allowed him to the full activity. He remained symptom-free until the recent follow-up (4 years).

the right side (Figure 3a). Unfortunately, stability was not restored due to? malposition and partial resorption of the coracoid. Because of the large glenoid defect, the bone block reconstruction was performed (Figure 3b). Later, another Latarjet procedure was performed on the left side with no technical error. However, the patient experienced a seizure within 2 weeks following the operation, which resulted in displacement of the coracoid (Figure 4a). Finally, the left shoulder was revised with the iliac crest bone block (Figure 4 b-c). Shoulder function and stability were restored and so was the patient's satisfaction (Figure 5.)



Figure 1. Case I. A 33-year-old male (a) treated with the Latarjet procedure, (b,c – partial resorption of the coracoid).

Case II. Reposition of displaced coracoid transfer

A 20-year-old male had been treated with the coracoid transfer following a failed Bankart repair a few years before. Due to some doubt about the quality of the technique, an X-ray was performed during the early follow-up. Malposition of the screws was confirmed and the patient underwent an early revision (1 week from the first coracoid procedure) to correct the placement of the coracoid (Figure 2).

Case III. Bone block reconstruction of anterior glenoid

A 24-year-old male with bilateral shoulder instability due to epilepsy had been primarily treated with the Latarjet procedure on

Discussion

Apart from the Greisser study, another systematic review of compilations resulting from the coracoid transfer was performed by Butt and Charamalious (2012). The authors collected 30 papers, which included a total of 1658 described cases. They found a slightly lower risk of recurrence (6%) as the second most common complication. Redislocation affected 46 cases (2.8%) and resulted from a traumatic episode (17%), technical error (12%) or for no clear reason (17%). Subluxations affected 3.3% of all the coracoid transfers. The authors also found that the most instabilities occurred within the first year (73%) or within 2 years (87%) among young males and in the dominant shoulder.

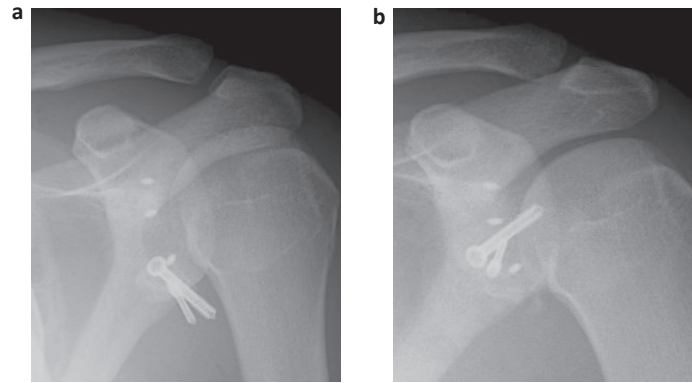


Figure 2. Case II. A 20-year-old male treated with the Latarjet procedure due to a previously failed Bankart repair. An early X-ray revealed malposition of the screws (a). The fixation was corrected (b).

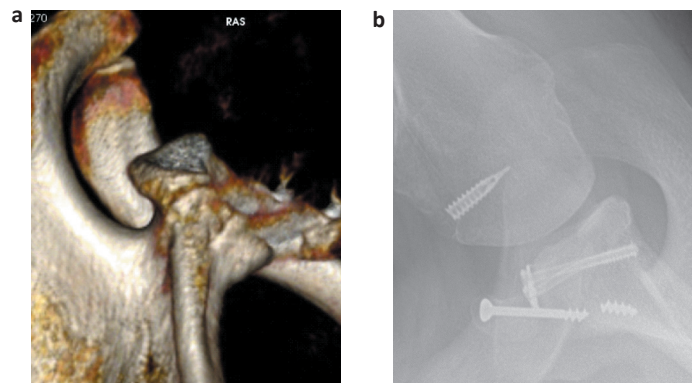


Figure 3. Case III. A 24-year-old male with bilateral shoulder instability due to epilepsy. The right shoulder treated with the Latarjet procedure that failed to stabilize the shoulder (a) and due to the large glenoid defect was revised with bone block reconstruction (b).

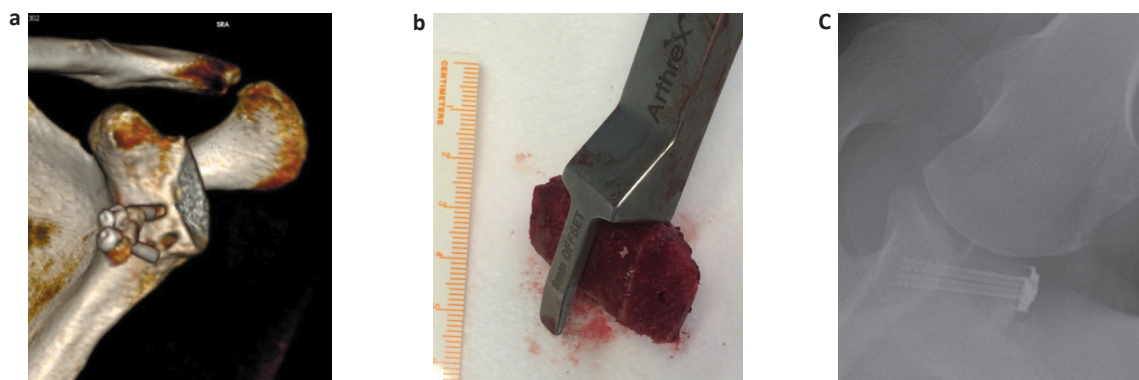


Figure 4. Case III. The same patient as presented in Figure 3 who was treated with Latarjet procedure on the left side with no technical error. The patient experienced a seizure within two weeks following the operation which resulted in displacement of the coracoid (a). The shoulder was revised with the iliac crest bone block (b-c).

How to deal with failed Latarjet?

A failed instability repair may either result from a significant trauma (high level of external force) or a minor trauma (Tauber *et al.* 2004). In the latter case one should question the quality of the original diagnosis or the adequate appreciation of the

lesions (humeral head, glenoid, soft tissues). No strong recommendations or evidence-based guidelines can be provided since there are only few studies available: 2 on Latarjet, 17 on revision instability and 1 systematic review.

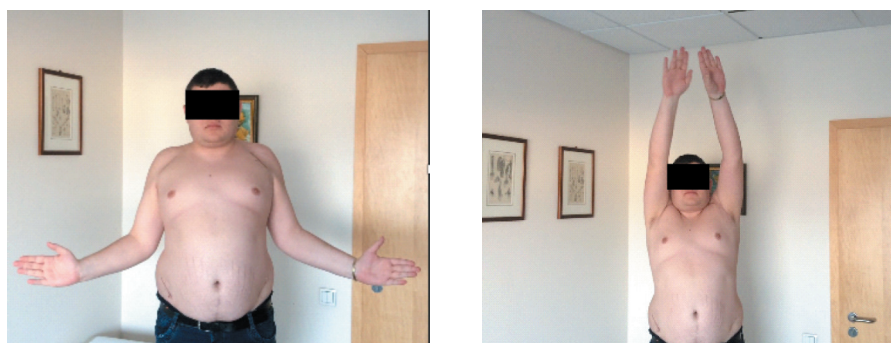


Figure 5. Clinical results of the patient (Case III) – shoulder function at follow-up in the patient having bilateral glenoid reconstruction with the iliac crest bone-graft.

Can revision of failed stability operation be successful?

De Giorgi *et al.* (2014) analyzed a group of 22 patients with an arthroscopic revision of a failed previous labral repair. They reported the recurrence rate of 21% (36% if the persistent positive apprehension is included). At 13.6% it would result from a serious trauma and at 13.6% with no trauma at all. The authors concluded that the arthroscopic revision in a failed soft tissue procedure has a low value as a treatment option.

Friedman *et al.* (2014) preformed a systematic review on recurrent instability after a revision of anterior shoulder stabilization based on 17 studies and 388 shoulder procedures. Interestingly, the authors found no difference in recurrence when the revision was performed with the use of the arthroscopic Bankart re-repair (14.7%), the Bristow-Latarjet procedure (14.3%) or the open Bankart revision-repair (5.5%). Any other procedure would have much larger risk (42.7%). The results, however, were very variable and multiple different procedures were used. The authors suggested that the choice of the right procedure comes down to the proper patient selection. Similar results would confirm that in a selected group of patients arthroscopic revision may yield satisfactory results (Boileau *et al.* 2009). The outcome of the revision procedure is less predictable in patients with multiple previous surgeries (Meehan and Petersen 2005).

Is non-operative treatment an option?

Marquardt *et al.* (2007) presented the result of a failed traumatic anterior shoulder instability repair with and without surgical revision. Out of 24 patients with the failed primary Bankart repair, eight remained without re-operation and 16 underwent the stabilization revision (6 had another repeated stabilization). A satisfying functional outcome was achieved when either no surgery was performed or the first attempt of revision was successful (no difference in Constant and ASES scores). The results of repeated revisions were inferior to those in non-operated patients.

Is soft tissue an option for failed coracoid transfer?

Castagna *et al.* (2010) presented the results of 18 arthroscopic revisions of a failed open Latarjet procedures. All patients in the series received arthroscopic capsuloplasty. Instability persisted or recurred in 16.7% of the patients (3 cases). One case was related to modest trauma, and the remaining 2 had persistent subluxations. The authors concluded that satisfactory results could be achieved with minimal surgical invasion in selected cases.

Addressing the soft tissue may play a role in limiting the risk of recurrence following the primary Latarjet procedure. Hovelius *et al.* (2012) has shown improvement in Latarjet efficacy from 18% to only 4% risk of relapse when a capsular shift was added to the procedure. A similar concept has

been recently introduced by Boileau in his arthroscopic Bankart-Bristow-Latarjet procedure (Boileau *et al.* 2010). The coracoid tip is fixed with the endobutton system and labral repair is performed to recreate the anterior bumper also protecting the humeral head from contact with the coracoid graft. Preservation of the capsule may also play a role in improving proprioception. Another arthroscopic option could be combined bone graft from the iliac crest with capsule-labral coverage (Figure 6). However, these procedures should be reserved for advanced arthroscopists due to a high level of difficulty.

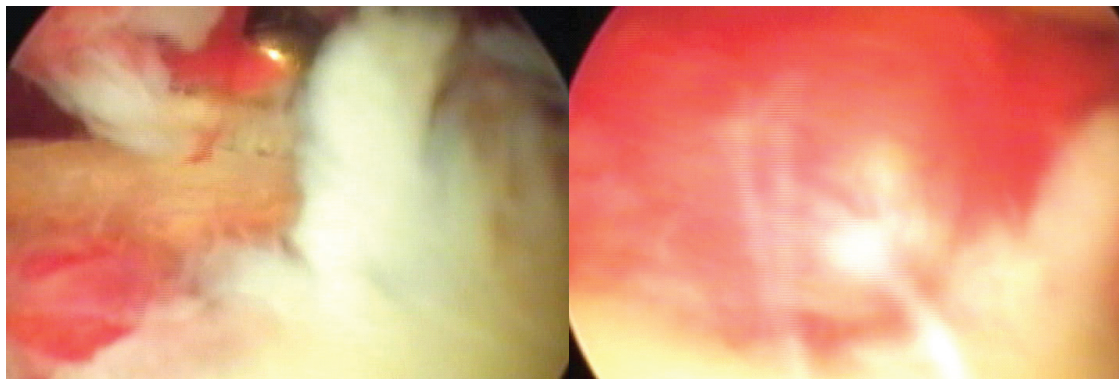


Figure 6. Pictures of arthroscopic glenoid reconstruction with the iliac crest bone graft.

How to reconstruct the bone after failed coracoid transfer?

One of the options is to reposition the coracoid graft again and fix it back to the place. However, that option might be difficult and risky because of possible adhesions and scars in the proximity of the brachial plexus and the brachial artery. Another option is to ignore the previous procedure and reconstruct the bone with the bone block. Lunn *et al.* (2008) presented a series of 34 cases (available from 46 operated) with a modified Eden-Hybinette operation after a failed Latarjet procedure. Good and excellent results could be achieved in 79% of the patients based on shoulder scores and in 90% of the patients based on subjective evaluation. Osteoarthritis increased from 18% preoperatively to 29% postoperatively. The recurrence rate was 12%, however,

38% of the patients remained apprehensive. 68% returned to the pre-dislocation level of sport.

Calvo (2014) has suggested a simple algorithm in case of the failed Latarjet procedure. I have made a slight modification by adding the conservative treatment option (Figure 7).

Conclusions

No strong recommendations could be made based on the limited literature on the topic. Yet, in case of the recurrence of instability following the Latarjet procedure several options are available. The decision should

be made based on clinical picture (severity of instability, epilepsy) and imaging (bone defects). For minor instability with no hardware impingement, non-operative treatment could be the option. For a more disabling instability, revision surgery could be considered, whereas in rare cases of good bone stock, a soft tissue procedure might be attempted (possibly in arthroscopic approach). In case of bone defect and still reparable previous transfer, reposition of the coracoid with stable fixation can be performed. Non-reparable coracoid should however be ignored, and the glenoid should be reconstructed with the iliac crest bone graft. One has to remember that revision surgeries are more difficult to perform and their outcomes are inferior to primary successful shoulder stabilization.

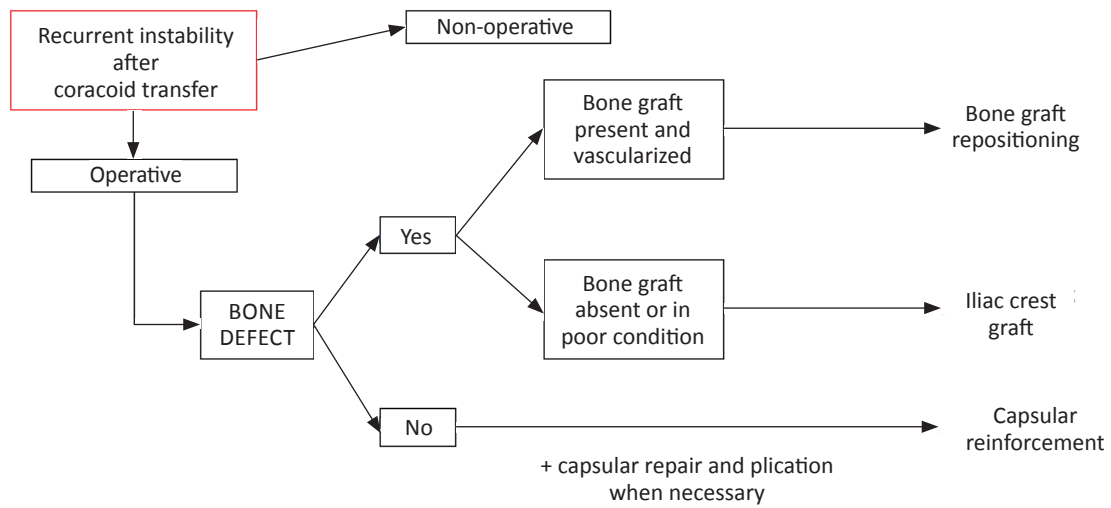


Figure 7. Algorithm of treatment options for recurrence of instability following coracoid transfer – modified from Calvo (2014).

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