Management of (traumatic) anterior shoulder instability: current treatment and future perspectives The open Bankart procedure still state of the art in 2020

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Chapter 5

The open modified Bankart procedure: outcome at follow-up of 10 to 15 years

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Abstract

We report the outcome of a modified Bankart procedure using suture anchors in 31 patients (31 shoulders) with a mean follow-up of 11 years (10 to 15).

The mean age of the patients was 28 years (16 to 39). At follow-up, the mean Rowe score was 90 points (66 to 98) and the Constant score was 96 points (85 to 100). A total of 26 shoulders (84%) had a good or excellent result. The rate of recurrence varied between 6.7% and 9.7% and depended on how recurrence was defined. Two patients had a significant new injury at one and nine years, respectively after operation. The overall rate of instability (including subluxations) varied between 12.9% and 22.6%. All patients returned to work, with 29 (94%) resuming their pre-operative occupation and level of activity. Mild radiological osteoarthritis was seen in nine shoulders (29%) and severe osteoarthritis in one.

We conclude that the open modified Bankart procedure is a reliable surgical technique with good mid to long-term results.

Introduction

The common form of instability of the shoulder is traumatic anterior dislocation,[1] and operative treatment is classified as anatomical or non-anatomical. The former was first described by Bankart[2] in 1938 and involves reconstruction of the labrum and/or capsular structures. Non-anatomical techniques include the Bristow-Latarjet procedure,[3] the Eden-Hybinette procedure,[4] the Magnusson-Stack procedure,[5] the Putti-Platt procedure[6] and the Weber osteotomy procedure.[7] More recently, the Bankart procedure has been described in association with a capsular shift, and arthroscopic techniques have also been developed.[8,9] However, recent reports have described a higher rate of failure in arthroscopic stabilisation.[10–13]

Many orthopaedic surgeons favor the open Bankart procedure because it has good long-term results with few complications.[10–17] However, despite its popularity, no long-term results in terms of glenohumeral arthritis[18–20] have been described. Long-term studies are needed because this disorder usually occurs in young patients.

We aimed to analyze the long-term clinical and radiological results of the modified Bankart repair in terms of stability and the incidence of glenohumeral osteoarthritis.

Patients and methods

In a retrospective single-surgeon (RTS) study 34 patients who had undergone stabilization of the shoulder between November 1989 and December 1993 were reviewed at a mean follow-up of 11 years (10 to 15). None had multi-directional instability or previous operative procedures on the shoulder. Three patients were lost to follow-up, leaving 31 for evaluation.

There were 26 males and five females with a mean age at the time of operation of 28 years (16 to 39). No patient had a bilateral procedure. Their mean age at follow-up was 40 years (29 to 50). Nine of the operations were on the dominant side and there were no operative complications. A standardized patient questionnaire in combination with a standardized physical examination of the shoulder and additional radiological examination were carried out.

The outcome was scored using the Rowe score,[21] the score of Constant and Murley[22] and the Dutch simple shoulder test (DSST).[23] Pain was scored using a visual analogue scale.[24] Overall patient satisfaction was determined by a four-point ordinal scale (excellent, good, moderate and poor) and the patients were asked whether they would undergo the same procedure again. Radiological evaluation was performed using the classification of Samilson and Prieto.[25] True internal and external rotation views, as well as an axillary view, were taken of both shoulders. At the final follow-up all assessments were done by an independent investigator (TDB).

Operative technique

The patient is under general anesthesia in a beach-chair position. The subscapularis tendon is incised vertically, approximately 1.5 cm medial to its insertion, leaving the inferior part intact. The capsule is incised vertically on the lateral side. A T-shaped capsular opening is created, raising a superior and an inferior capsular flap. The cortical layer of the glenoid rim is roughened with an osteotome to expose parts of bleeding cancellous bone. Three to four holes for bone anchors are made on the edge of the glenoid. Mitek I and later Mitek II (DePuy Mitek, Raynham, Massachusetts) anchors were used. The labrum (or its remnants) and the medial capsular flap are then reattached to the glenoid and the rotator interval closed. The two capsular flaps are then shifted, the superior flap inferiorly and the inferior flap superiorly, until it is sufficiently tight. The arm is held in neutral rotation and in abduction of approximately 30° during this manoeuvre. Finally, two additional sutures are placed between the two capsular flaps to close the horizontal T incision of the repair. The subscapularis muscle is reattached anatomically to its insertion. Post-operatively, the arm is placed in a shoulder immobilizer for six weeks.

Statistical analysis

This was performed using SPSS version 12.0.1 for Windows (SPSS Inc., Chicago, Illinois). Simple (fourfold) cross-table analysis was used to quantify the relationship between discrete outcome variables, such as instability and osteoarthritis, and various discrete risk factors, including age, gender, number of subluxations, function etc. We used the chi-squared test or Fisher's exact test for the binary variables. In cases of paired binary data (outcome variables) we used the McNemar test and a paired *t*-test for mean differences. In the case of a statistically significant association ($p \leq 0.05$), we used logistic regression to model the probability/odds of an outcome.

Results

Stability

At the final follow-up three patients (9.7%), all male, had encountered a re-dislocation, two after further trauma. One had fallen at high speed whilst water-skiing nine years after the initial operation. A further four patients (12.9%) complained of episodes of subluxation or had pain. Two of these described a sensation of subluxation during the first two years post-operatively, which then disappeared. The rate of instability varied between 12.9% and 22.6% depending on the definition (Table 1). Further reference to the instability group later in the text, relates to patients still experiencing instability at final follow-up (group B).

Three patients (9.7%) had a positive apprehension test during follow-up. All belonged to the instability group (B) and one had a further dislocation.

When using the (binary) multivariable logistic regression model with instability as the dependent variable, no significant correlation/regression was found for the covariates present, i.e. age (regression coefficient –1.240, $p = 0.291$), gender (regression coefficient 0.686, $p = 0.699$), length of follow-up (regression coefficient 0.197, $p = 0.665$), number of dislocations pre-operatively (regression coefficient 0.627, $p = 0.674$), presence of osteoarthritis at the time of follow-up (regression coefficient 1.360, $p = 0.289$) and external rotation at the time of follow-up (regression coefficient 0.601, $p = 0.696$).

Table 1: Summary of rate of instability at final follow-up vs during follow-up

Instability group*	Instability rate (%) (number of patients with dislocation + subluxation + pain)	Recurrence rate (%) (number of patients with dislocation)	Number of patients with subluxation + pain
Group A (n = 7)	22.6 (7)	9.7 (3)	4
Group B (n = 5)	16.1 (5)	9.7 (3)	2†
Group C (n = 4)	12.9 (4)	6.4 (2)‡	2†

* A, all patients with any episode of post-operative instability during follow-up; B, all patients with instability symptoms at the time of final review; C, as group B with the one late trauma patient excluded at the time of final review.

† Minus the 2 patients with no complaints of subluxation at final follow-up.

‡ Minus 1 trauma patient at 108 months after surgery.

Rowe score, Constant score and Dutch simple shoulder test

The mean Rowe score at final follow-up was 90 (66 to 98) and the mean Constant score for the operated side was 96 (85 to 100) and for the non-operated side 99 (82.5 to 100). The mean DSST was 12 of 13 (9 to 13). The mean results for each of the instability groups are presented in Table 2.

Table 2: Summary of mean (range) Rowe, Constant and Dutch simple shoulder test (DSST) scores for the different instability groups

Instability group*	Rowe score	Constant score (affected shoulder)	Constant score (unaffected shoulder)	DSST (maximum 13)
Group A (n = 7)	90 (66 to 98)	96 (85 to 100)	99 (82,5 to 100)	12 (9 to 13)
Group B (n = 5)	76 (66 to 89)	90 (85 to 95)	97 (89 to 100)	11 (9 to 13)
Group C (n = 4)	72 (66 to 78)	90 (85 to 95)	96 (89 to 100)	11 (9 to 13)

* A, all patients with any episode of post-operative instability during follow-up; B, all patients with instability symptoms at the time of final review; C, as group B with the one late trauma patient excluded at the time of final review.

Overall patient satisfaction / confidence / visual analogue score – pain

At the time of follow-up, 26 (84%) of the patients had excellent or good results. Two (6%) had poor results. Both belonged to the instability group. A total of 28 (90%) had no limitations in function. The mean visual analogue pain score was 0.5 (0 to 3) for the operated side compared with 0.2 (0 to 6) for the non-operated side. A total of 27 patients (87%) stated that they would have the operation again.

Functional results

The mean external rotation (in 0° of abduction) was 47° (10° to 75°) for the operated side compared with 53° (30° to 80°) for the non-operated side. Four patients (13%) had a difference of more than 15° of external rotation (5° to 35°) in 0° of abduction in the operated arm compared with the non-operated arm at follow-up. The mean external rotation in 90° of abduction was 89° in each arm (80° to 90°). All patients had a full range of flexion and abduction on the operated side. One showed minor restrictions (160° of flexion and abduction) on the non-operated side. In this patient, however, at the time of follow-up, radiographs showed severe signs of osteoarthritis (Samilson-Prieto[25] class III) on the non-operated side. We found a mean difference of 6° of external rotation (0° to 35°) in 0° of abduction in favor of the non-operated side (paired *t*-test, $p = 0.001$). No patient had signs of diminished strength or atrophy of the shoulder musculature on the non-operated side.

Post-operative glenohumeral osteoarthritis

At the time of follow-up, 30 (97%) of the contralateral shoulders had no signs of osteoarthritis according to the Samilson-Prieto[25] classification. As described, the remaining patient had severe unilateral osteoarthritis (Samilson-Prieto[25]-III). On the operated side, 21 shoulders (68%) had no signs of osteoarthritis (Samilson-Prieto[25]-0), nine (29%) had mild (Samilson-Prieto[25]-I) and one (3%) severe osteoarthritis (Samilson-Prieto[25]-III). The shoulders with signs of severe osteoarthritis occurred in separate patients. The incidence of osteoarthritis (Samilson-Prieto[25] class I to III) on the operated side compared with that on the non-operated side was statistically significant (McNemartest, p = 0.012). No statistically significant covariates were found regarding glenohumeral osteoarthritis on the operated side as the dependent variable (e.g. gender ($p = 0.522$), age at time of operation ($p = 0.958$), time until operation ($p = 0.686$), patient satisfaction ($p = 0.313$), instability ($p = 0.147$), number of dislocations pre-operatively ($p = 0.109$), external rotation at time of follow-up ($p = 0.525$)).

Work participation

Of the 31 patients, 29 (94%) returned to their former work or reached the same level of activity. Two (6%) changed occupation. However, these changes were not shoulder-

related. Post-operative restrictions during work were scored on a five-point ordinal scale (no problems, occasional problems, and minor, moderate and severe problems). A total of 22 patients (71%) had no restrictions at all at the time of follow-up and six (19%) had occasional problems, mainly during overhead work activities. One of these patients continued to experience instability and two showed minor signs of osteoarthritis (Samilson-Prieto[25] class I) on the operated side. Two patients (6%) had minor problems during work activities, one of whom had instability symptoms. Another patient with instability reported moderate problems during work. None of our patients described their problems as severe. In the logistic regression model no significant covariates were found with resumption of work as the dependent variable (gender $p = 0.178$, age at time of operation $p = 0.563$, time until operation $p = 0.521$, patient satisfaction $p = 0.701$, instability $p = 0.178$, number of dislocations pre-operatively $p = 0.338$, external rotation at time of follow-up $p = 0.579$, respectively).

Sports participation

Regarding the restrictions in sport activities the same ordinal scale was used. Pre-operatively, 28 patients (90%) participated in some form of sports activity, of whom 15 did contact and 13 non-contact sports. At the final follow-up, 22 (71%) participated in some form of sports activities, of whom 18 (82%) regained their pre-operative level of activity and eight (36%) resumed contact sports. Comparison of these groups (sport *versus* no sport) showed no major differences in regard to the age and the Rowe, DSST and Constant scores (Table 3).

At follow-up, one patient had severe difficulties during overhead sport activities such as tennis. This patient had no functional restrictions (external rotation > 45°), no instability or a positive apprehension test and no signs of osteoarthritis. Eight patients (26%) mentioned minor or moderate difficulties during overhead sport activities, five (16%) of whom described symptoms of instability and of these, one (3%) had severe signs of osteoarthritis (Samilson-Prieto[25] III) and three (10%) minor signs on the operated side.

Table 3: Sport *vs* no-sport group

	Sport (n = 22)	**Non-sport (n = 9)**
Mean age at time of follow-up (range)	41 (31 to 52)	42 (34 to 57)
Number of patients with instability complaints at time of follow-up	5	2
Mean Rowe score (range)	90 (67 to 98)	89 (67 to 97)
Mean DSST* (range)	12.5 (10 to 13)	11.9 (9 to 13)
Mean Constant score (range)	96 (85 to 100)	95 (86 to 100)

* DSST, Dutch Simple Shoulder test.

Discussion

Our study has shown that the rate of recurrent dislocation was 9.7%, all occurring after further trauma. The total rate of instability (dislocations and subluxations) was 22.6% at any stage post-operatively but by the time final review had reduced to 16.7% with inclusion of all patients.

There is always debate concerning recurrent dislocation after significant trauma regardless of timespan. Whether a dislocation after severe trauma without any foregoing shoulder complaints occurring years after stabilization should be classed as a failure is questionable. In two of the three patients with recurrence, this resulted from a new significant traumatic event and was probably not related to the stabilization procedure. One patient had a full functional shoulder without any complaints before the new injury nine years later. We believe that this patient should be classed as a recurrence, but not a failure of the operative technique.

If the rate of recurrence alone was used as an outcome of shoulder stabilization, then the success of the procedure is likely to be overestimated. Subluxation, pain and apprehension are also symptoms of instability and Kirkley et al.[26] have suggested that disease-specific measurement of quality of life should also be used. During follow-up, two patients reported feelings of instability during the first two years post-operatively, but these subsequently resolved. If we use the stringent definition of any form of post-operative instability then the outcome of the open Bankart procedure after ten years was good (12.9% (excluding high speed traumatic redislocation) to 22.6% instability), but if we use only recurrence, then the long-term results of the open Bankart procedure are excellent (6.7% (excluding high speed traumatic redislocation) to 9.7%).

Until now only short-term results of arthroscopic stabilization have been available.[27] Relatively high rates of instability (14% to 38%) are reported for arthroscopic Bankart repair with follow-up of more than five years compared with our ten-year results.[26,28]

The influence of shoulder surgery on the development of osteoarthritis is not well understood or well described in the literature.[20,25,29–34] It is unclear whether chondral injuries sustained during the episodes of instability contribute to the osteoarthritis or whether they are primarily caused by the stabilization procedure itself.[29] Generally, it is assumed that overtightening of the capsule and subscapularis lead to loss of external rotation and subsequent loss of cartilage. Stabilization techniques with a high risk of secondary glenohumeral osteoarthritis include the Putti-Platt, the Latarjet and the open Bankart procedures.[20,25,30–34] In 2004, Buscayret et al.[35] suggested that surgery did not influence the risk factors for arthritis. However, they did show a correlation between decreased external rotation after operation and glenohumeral arthritis. In their study, decreased external rotation correlated with arthritis, but this may have been secondary to glenohumeral osteoarthritis rather than a cause of it.

Our study showed that the incidence of radiological glenohumeral osteoarthritis after an open modified Bankart operation for traumatic unidirectional instability was 32% (10) for the operated side. However, nine shoulders showed mild (Samilson-Prieto[25]-I) and one severe signs of glenohumeral osteoarthritis (Samilson-Prieto[25]-III). The prevalence of osteoarthritis on the operated side after dislocation of the shoulder compared with that on the contralateral, was significantly different (10 *vs* 1, respectively, McNemar-test, $p = 0.012$). However, long-term follow-up (> 20 years) is needed to establish the degree of this mild osteoarthritis.

Van der Zwaag et al.[36] showed an increased rate of glenohumeral osteoarthritis after the Putti-Platt procedure and a positive correlation with the length of time after surgery. The number of dislocations before operation correlated with the severity of osteoarthritis but not with its incidence.[36] Our findings suggest that episodes of glenohumeral instability contribute to osteoarthritis, although the mechanism is unclear.

In our study, patients fully regained their work activities between three and six months after surgery. The general tendency is that most people can resume their pre-operative occupation and level of activity relatively quickly post-operatively.[37]

In one of the first reports concerning return to sports activities after a Bankart operation, Kjeldsen, Tordrup and Hvidt[38] found no differences in the range of movement, degree of disability or stability of the operated shoulders in two groups of patients who returned or did not return to sports activities. Of the reasons for not resuming sport, 71% gave sociopsychological causes such as anxiety or lack of time.

The results of the modified Bankart technique are rarely described in the literature,[19] but seem to show better results compared with the original Bankart or arthroscopic techniques (5% to 9% rate of recurrence, follow-up time two to five years). We found only three studies with a minimum follow-up period of ten years and these were reports of the original open Bankart procedure[12,20,39] in which the rate of recurrent dislocation varied between 0% and 10%. Our study has shown that the rate of recurrence varied between 6.7% and 9.7%, depending on how recurrence was defined.

We are aware of the limitations of the study. It is a retrospective study of a small series and there is no control group. However, we believe that our findings have shown that the modified open Bankart procedure for traumatic anterior glenohumeral dislocations is safe and effective with good objective and subjective long-term results and a high degree of patient satisfaction. As with the original procedure,[19] the modified open Bankart operation did not seem to prevent the onset of mild, asymptomatic radiological glenohumeral osteoarthritis.

References

1. Rockwood CA Jr, Matsen FA III, eds. The shoulder. Vol 1. Philadelphia: WB Saunders, 1990.
2. Bankart ASB. The pathology and treatment of recurrent dislocation of the shoulder joint. British Journal of Surgery 1938;26:23–9.
3. Latarjet M. A propos du traitement des luxations recidivantes de lápaule. Lyon Chir 1954;49:994–7.
4. Eden R. Zur operation der habutuellen schulterluxation unter mitteilung eines neuen verfahrens bei abriss am inneren pfannenrande. Dtsche Ztschr Chir 1918;144:269–80.
5. Magnuson PB, Stack JK, Peltier LF. Recurrent dislocation of the shoulder. Clin Orthop 1991;269:4–8.
6. Osmond-Clarke H. Habitual dislocation of the shoulder: The Putti-Platt operation. J Bone Joint Surg [Br] 1948;30-B:19–25. Abstract,
7. Weber BG, Simpson LA, Hardegger F. Rotational humeral osteotomy for recurrent anterior dislocation of the shoulder associated with a large Hill-Sachs lesion. J Bone Joint Surg [Am] 1984;66-A:1443–50.
8. Altcheck DW, Warren RF, Skyhar MJ, Ortiz G. T-plasty modification of the Bankart procedure for multidirectional instability of the anterior and inferior types. J Bone Joint Surg [Am] 1991;73-A:105–12.
9. Neer CS 2nd, Foster CR. Inferior capsular shift for involuntary inferior and multidirectional instability of the shoulder: a preliminary report. J Bone Joint Surg [Am] 1980;62-A:897–908.
10. Freedman KB, Smith AP, Romeo AA, Cole BJ, Bach BR Jr. Open Bankart repair versus arthroscopic repair with transglenoid sutures or bioabsorbable tacks for recurrent anterior instability of the shoulder: a meta-analysis. Am J Sports Med 2004;32:1520–7.
11. Mohtadi NG, Bitar IJ, Sasyniuk TM, Hollinshead RM, Harper WP. Arthroscopic versus open repair for traumatic anterior shoulder instability: a meta-analysis. Arthroscopy 2005;21:652–8.
12. Tingart M, Bathis H, Bouillon B, Neugebauer E, Tiling T. Surgical therapy of traumatic shoulder dislocation: are there evidence-based indications for arthroscopic Bankart operation? Unfallchirurg 2001;104:894–901 (in German).
13. Lenters TR, Franta AK, Wolf FM, Leopold SS, Matsen FA 3rd. Arthroscopic compared wih open repairs for recurrent anterior shoulder instability: a systematic review and meta-analysis of the literature. J Bone Joint Surg [Am] 2007;89-A:244–54.
14. Gill TJ, Zarins B. Open repairs for the treatment of anterior shoulder instability. Am J Sports Med 2003;31:142–53.
15. Pagnani MJ, Dome DC. Surgical treatment of traumatic anterior shoulder instability in american football players. J Bone Joint Surg [Am] 2002;84-A:711–15.
16. Rokito AS, Namkoong S, Zuckerman JD, Gallagher MA. Open surgical treatment of anterior glenohumeral instability: an historical perspective and review of the literature. Part I. Am J Orthop 1998;27:723–5.
17. Rokito AS, Namkoong S, Zuckerman JD, Gallagher MA. Open surgical treatment of anterior glenohumeral instability: an historical perspective and review of the literature. Part II. Am J Orthop 1998;27:784–90.
18. Hovelius LK, Sandstrom BC, Rosmark DL, et al. Long-term results with the Bankart and Bristow-Latarjet procedures: recurrent shoulder instability and arthropathy. J Shoulder Elbow Surg 2001;10:445–52.
19. Pelet S, Jolles BM, Farron A. Bankart repair for recurrent anterior glenohumeral instability: results at twenty-nine years' follow-up. J Shoulder Elbow Surg 2006;15:203–7.

20. Rosenberg BN, Richmond JC, Levine WN. Long-term follow up of Bankart reconstruction: incidence of late degenerative glenohumeral arthrosis. Am J Sports Med 1995;23:538–44.
21. Rowe CR, Patel D, Southmayd WW. The Bankart procedure: a long-term end-result study. J Bone Joint Surg [Am] 1978;60-A:1–16.
22. Constant CR, Murley AH. A clinical method of functional assessment of the shoulder. Clin Orthop 1987;214:160–4.
23. Lippitt S, Matsen F. Mechanisms of glenohumeral joint stability. Clin Orthop 1993;291:20–8.
24. Langley GB, Sheppeard H. The visual analogue scale: its use in pain measurement. Rheumatol Int 1985;5:145–8.
25. Samilson RL, Prieto V. Dislocation arthropathy of the shoulder. J Bone Joint Surg [Am] 1983;65-A:456–60. Crossref.
26. Kirkley A, Werstine R, Ratjek A, Griffin S. Prospective randomized clinical trial comparing the effectiveness of immediate arthroscopic stabilization versus immobilization and rehabilitation in first traumatic anterior dislocations of the shoulder: long-term evaluation. Arthroscopy 2005;21:55–63.
27. Calvo E, Granzio JJ, Fernández-Yruegas D. Criteria for arthroscopic treatment of anterior instability of the shoulder: a prospective study. J Bone Joint Surg [Br] 2005; 87-B:677–83. Abstract,
28. Kartus J, Kartus C, Matis N, Forstner R, Herbert H. Long term independent evaluation after arthroscopic extra-articular Bankart repair, with absorbable tacks: a clinical and radiological study with a seven to ten-year follow-up. J Bone Joint Surg [Am] 2007;89-A:1442–8.
29. Cameron ML, Kocher MS, Briggs KK, Horan MP, Hawkins RJ. The prevalence of glenohumeral osteoarthrosis in unstable shoulders. Am J Sports Med 2003;31:53–5.
30. Hawkins RJ, Angelo RL. Glenohumeral osteoarthrosis: a late complication of the Putti-Platt repair. J Bone Joint Surg [Am] 1990;72-A:1193–7.
31. Morrey BF, Janes JM. Recurrent anterior dislocation of the shoulder: long-term follow-up of the Putti-Platt and Bankart procedures. J Bone Joint Surg [Am] 1976;58-A:252–6.
32. O'Driscoll SW, Evans DC. Long-term results of staple capsulorrhaphy for anterior instability of the shoulder. J Bone Joint Surg [Am] 1993;75-A:249–58.
33. Trevlyn DW, Richardson MW, Fanelli GC. Degenerative joint disease following extracapsular anterior shoulder reconstruction. Contemp Orthop 1992;25:151–6.
34. Zuckerman JD, Matsen FA 3rd. Complications about the glenohumeral joint related to the use of screws and staples. J Bone Joint Surg [Am] 1984;66-A:175–80.
35. Buscayret F, Edwards TB, Szabo I, et al. Glenohumeral arthrosis in anterior instability before and after surgical treatment: incidence and contributing factors. Am J Sports Med 2004;32:1165–72.
36. van der Zwaag HM, Brand R, Obermann WR, Rozing PM. Glenohumeral osteoarthrosis after Putti-Platt repair. J Shoulder Elbow Surg 1999;8:252–8.
37. Gill TJ, Micheli LJ, Gebhard F, Binder C. Bankart repair for anterior instability of the shoulder: long-term outcome. J Bone Joint Surg [Am] 1997;79-A:850–7.
38. Kjeldsen SR, Tordrup PJ, Hvidt EP. Return to sport after a Bankart operation of the shoulder using the Mitek anchor system. Scand J Med Sci Sports 1996;6:346–51.
39. Chapnikoff D, Besson A, Chantelot C, et al. Bankart procedure: clinical and radiological long-term outcome. Rev Chir Orthop Reparatrice Appar Mot 2000;86:558–65 (in French).