

Original Research Article

Cost-effectiveness of the arthroscopic Bankart procedure versus open Latarjet in the treatment of anterior shoulder instability

Maximiliano Cruz Palacios*, Ramon Esperon Hernandez, Felipe Camara Arrigunaga,
Felipe Amador Martinez Escalante, Guillermo Bobadilla Lezcano

Hospital de Ortopedia Cruz Roja de Mérida, Mérida, Yucatán, Mexico

Received: 27 July 2026

Accepted: 23 September 2026

*Correspondence:

Dr. Maximiliano Cruz Palacios,

E-mail: dr.maximilianocruz@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: The objective of this study was to evaluate the cost-effectiveness of the Latarjet procedure compared to arthroscopic Bankart repair as first-line treatment for recurrent shoulder instability in patients with ISIS greater than 3. It was hypothesized that the Latarjet procedure is more cost-effective due to its lower recurrence rate in patients who participate in high-demanding shoulder activities. Mean age was 32.42 ± 12.11 years (15-40).

Methods: Retrospective, comparative cohort study including 33 patients (33 shoulders) with anterior shoulder instability treated with arthroscopic Bankart or Latarjet repair between 2018 and 2024. Patients aged 18 to 45 years with a minimum follow-up of 1 year, impact sports activity, and ISIS score >3 were included. Postoperative constant and Rowe scores were evaluated, and procedure costs were obtained from hospital administration. Cost-effectiveness analysis was performed using the ICER index.

Results: The sample population included 27 male patients (81.8%), 6 female patients (18.2%), with mean age of 24.62 (range from 18 to 45 years); a total of 33 shoulders. The study compared the costs of arthroscopic Bankart surgery (\$25,481) and open Latarjet surgery (\$19,019), showing a significant difference ($p < 0.001$). The cost of devices was higher for Bankart procedure (\$11,399 versus \$2,940 $p < 0.01$); two anchors were used in most Bankart cases, while two titanium screws were used in all Latarjet cases.

Conclusions: The Latarjet procedure, although less expensive than arthroscopic Bankart surgery, shows a clinically and statistically significant improvement in postoperative constant and Rowe scores. With no significant difference in hospitalization costs and a lower rate of recurrence of instability. Both procedures are effective in improving anterior shoulder instability.

Keywords: Anterior instability, Bankart, Cost-effectiveness, Latarjet, Shoulder surgery

INTRODUCTION

The glenohumeral joint is the joint with the highest incidence of dislocation. Although, they can be treated conservatively, the risk of recurrence of instability is particularly high, especially in young patients and contact athletes. The treatment of traumatic anterior glenohumeral instability has always been a subject of debate for the last few years in the global literature.¹

The two most common surgical options for the treatment of patients with shoulder instability are arthroscopic Bankart repair and bony reconstruction, such as the Latarjet technique. Arthroscopic Bankart repair is often considered the first line of treatment for recurrent shoulder instability, due to its anatomic approach and common performance, being generally less technically complex.²

Although Bankart arthroscopic intervention has a low risk of complications, it is associated with a relatively high rate of recurrence of instability, especially in the context of bone loss and in athletes involved in contact sports.²

On the other hand, the Latarjet procedure is a non-anatomic surgical intervention that consists of relocating the coracoid process to the anterior glenoid to achieve stability. This procedure is performed less frequently and is more technically demanding compared to the arthroscopic Bankart repair. The Latarjet procedure is effective in restoring glenohumeral stability, with lower recurrence rates than Bankart repair. It also maintains high subjective shoulder function values, reaching 90% at 20-year follow-up.³

However, it has a higher rate of overall complications (including a higher risk of nerve injury and problems with surgical material) compared to arthroscopic Bankart repair. This higher complication rate associated with the Latarjet procedure, along with the relative unfamiliarity with the technique, may make many surgeons reluctant to use it as a first-line treatment.³

Balg and Boileau developed the Instability Severity Index (ISIS), whose score is based on well-established risk factors for recurrent dislocation, to quantify the risk of recurrent instability. They report a 15% recurrence after performing a stabilization procedure in unselected patients, which underscores the importance of proper patient selection.⁴

Six reproducible risk factors for recurrent anterior shoulder instability have been identified: age less than 20 years at the time of surgery, participation in contact sports or overhead activities, sports practice at a competitive level, hyperlaxity, presence of Hill-Sachs lesion on an anteroposterior radiograph with the shoulder in external rotation, and loss of anteroinferior glenoid contour on an anteroposterior radiograph.⁵

This index is scored from 1 to 10 points, and a score greater than 6 has been associated with a 70% recurrence risk in patients undergoing arthroscopic stabilization. Phadnis et al. concluded that a score of 4 or higher is useful in predicting stabilization failure, although they confirmed that in these patients with scores >4, the recurrence rate of instability on Bankart repair exceeds 70%.⁴

It has yet to be determined which procedure is best in its cost-benefit ratio as an initial treatment. In the current context of cost-focused healthcare, it is critical to establish which treatments are the most cost-effective. The cost-effectiveness of a procedure can be assessed by a cost-utility analysis, which examines the ability of the procedure to change the patient's quantity and quality of life.¹

The objective of this study was to determine the cost-effectiveness of the Latarjet procedure compared with an arthroscopic Bankart repair as the primary treatment for recurrent shoulder instability in patients without glenoid bone loss. We hypothesized that the Latarjet procedure is more cost-effective, given its lower recurrence rate in

those patients who perform high-demand activities for the shoulder.

Cost estimate

The cost for each procedure was obtained from our institution's records. The cost includes the cost of implants, anesthesia, and surgical fees. The costs of preoperative and postoperative visits; and the costs of physical therapies were not included because it is assumed that they were equivalent in both groups.

METHODS

This was a retrospective, comparative cohort study. A total of 37 eligible patients (37 shoulders) operated between September 2018 to January 2024 obtained from our hospital database were studied. Patients first presented to the emergency department of our institution with a diagnosis of traumatic anterior dislocation of the shoulder, who underwent reduction with Kocher maneuver and were subsequently sent to the outpatient clinic of the shoulder module with axial tomography and magnetic resonance imaging of the affected shoulder. The decision as to which procedure to perform on each patient, between the arthroscopic Bankart procedure or a Latarjet procedure, was made by the experienced shoulder surgeon in charge of the shoulder module depending on the ISIS score obtained and the clinical characteristics of the patient.

Patients aged 18 to 45 years with a diagnosis of anterior shoulder instability, postoperative Bankart repair via arthroscopy, postoperative Latarjet procedure, no previous surgeries on the affected shoulder, with a minimum follow-up of one year, patient with impact sports activities and patients with an ISIS score greater than 3 were included.

Two patients with anterior shoulder dislocation and a diagnosis of instability who were older than 45 years and two with a follow-up of less than one year were excluded; and 7 who had ISIS less than or equal to 3, resulting in a total of 33 patients.

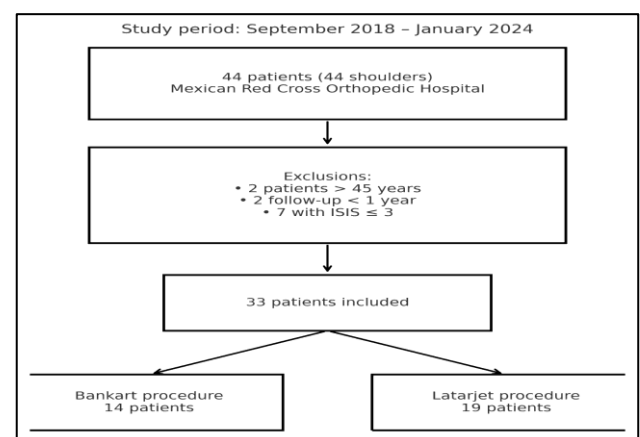


Figure 1: Patient selection flowchart.

The postoperative constant and Rowe scores were obtained prospectively, the costs of the procedures were obtained from the hospital administration area, in order to subsequently perform the cost-effectiveness analysis.

Statistical analysis

The data source was the patient database of the Hospital de Ortopedia de la Cruz Roja, Merida, Yucatan treated from 2017-2023. SPSS software was used for data analysis. Demographic and clinical variables were described using measures of central tendency and dispersion.⁶

RESULTS

The sample population included 27 male patients (81.8%), 6 female patients (18.2%), with mean age of 24.62 (range from 15 to 40 years); a total of 33 shoulders; 21 right shoulders (63.6%) and 12 left shoulders (36.4%), 19 patients were of high occupational and/or sporting demand, i.e., practicing sports with overhead activities (57.6%) and 14 patients were not (42.4%). Fourteen patients underwent Bankart procedures (42.4%) and 19 patients underwent Latarjet procedures (57.6%). The remaining demographic characteristics of both groups are shown in Table 1.

Table 1: Demographic characteristics of both groups.

	N	Mean	SD
Age in years	33	32.42	12.112
Age at first dislocation	33	26.82	12.038
Number preoperative dislocations	33	4.45	2.774
ISIS	33	4.12	1.269

ISIS- Instability severity index score.

The preoperative Rowe in the Bankart group was 1.79, in the Latarjet group it was 2.11. Postoperatively both groups obtained a mean of 76.07 for the Bankart group and 86.84 for the Latarjet group. The improvement in the Rowe and constant postoperatively with respect to the initial one, it was statistically significant ($p < 0.001$); translating that both procedures are effective in improving the Rowe score.

The preoperative constant in the Bankart group was 61.28, in the Latarjet group it was 62.57. Postoperatively, both

groups obtained a mean Constant of 85.36 for the Bankart group and 93.11 for the Latarjet group, which translates into a significant clinical and statistical improvement ($p < 0.001$); this means that both procedures were effective for clinical improvement.

The difference in constant points was 24.07 for the Bankart group and 30.52 for the Latarjet group; the difference between groups was 6.45 points, in favor of the Latarjet procedure, being clinically not significant.

The average cost of arthroscopic Bankart surgery was \$11,399, while the average cost of open Latarjet surgery was \$2,940 ($p < 0.001$) being statistically significant.

The most influential cost subcategories in the estimation were those related to operating room, surgical material and hospital stay. Cost per hospital stay for a Bankart procedure \$14,082 M. N. compared to Latarjet which was \$16,079 M. N. with no significant difference ($p = 0.08$).

As for the total cost for the arthroscopic Bankart procedure a mean of (\$25,481 M. N.) and for the Latarjet procedure it was with a mean of (19, 019 M. N.) with significant difference ($p < 0.01$).

significant difference ($p < 0.01$). For arthroscopic Bankart repair, 2 anchors 2.8 mm preloaded with a suture thread were used in 10 patients (71.42%), and 3 anchors in 4 patients (28.5%), this decision was taken transoperatively. In contrast, for a Latarjet procedure, 2 cannulated 4.0 mm titanium screws were used in 100% cases.

Table 2 presents mean costs by procedure. Hospitalization costs were comparable between groups (14,082 versus 16,079; $p = 0.084$). Material costs were substantially higher for Bankart than for Latarjet (11,399 versus 2,940; $p < 0.001$), yielding a higher total cost for Bankart (25,482 versus 19,020; $p = 0.006$).

Table 3 compares functional scales between procedures. Preoperative constant and Rowe scores did not differ (constant 61.29 versus 62.58; $p = 0.156$; Rowe 1.79 versus 2.11; $p = 0.360$). Postoperatively, constant scores were higher in the Latarjet group (93.11 versus 85.36; $p = 0.024$), whereas Rowe scores showed a non-significant difference (86.84 versus 76.07; $p = 0.080$).

Table 2: Average costs by procedure.

Costs	Mean		Mean differences		
	Bankart	Latarjet	t	df	P value
Cost of hospitalization	14,082.2800	16,079.3684	-1.414	31	0.084
Material cost	11,399.3700	2,940.2105	5.936	31	0.000*
Total cost	25,481.6500	19,019.5789	2.696	31	0.006*

Df- degrees of freedom. *Significant difference $p < 0.01$.

Table 3: Functional scales averages.

	Mean		Mean differences		
	Bankart	Latarjet	t	df	P value
Constant Preoperative	61.286	62.579	-1.028	31	0.156
Rowe Preoperative	1.79	2.11	-0.361	31	0.360
Constant Postoperative	85.36	93.11	-2.068	31	0.024*
Postoperative Rowe	76.07	86.84	-1.438	31	0.080

*Significant difference $p < 0.05$.

Table 4: Pre and postoperative differences in Bankart procedure.

	Mean		Mean differences		
	Preoperative	Postoperative	t	df	P value
Constant	61.286	85.36	-13.556	32	<0.001*
Rowe	1.79	76.07	-21.416	32	<0.001*

*Significant difference $p < 0.05$.

Table 5: Pre- and postoperative differences in Latarjet procedure.

	Mean		Mean differences		
	Preoperative	Postoperative	t	df	P value
Constant	62.579	93.11	-13.556	32	<0.001*
Rowe	2.11	86.84	-21.416	32	<0.001*

*Significant difference $p < 0.05$.

Table 4 shows within-group changes for the Bankart procedure. Both constant and Rowe scores improved markedly from preoperative to postoperative assessments (constant 61.29→85.36; $p < 0.001$; Rowe 1.79→76.07; $p < 0.001$).

Table 5 shows within-group changes for the Latarjet procedure. Both constant and Rowe scores improved markedly from preoperative to postoperative assessments (constant 62.58→93.11; $p < 0.001$; Rowe 2.11→86.84; $p < 0.001$).

Table 6: Number of recurrences.

Procedure	Number	%
Bankart	4	28
Latarjet	1	5.2
Total	5	15

The number of recurrent patients was 5 patients (Table 6) of which 4 patients underwent Bankart and 1 patient underwent Latarjet. Of the patients who recurred, the earliest time to recurrence was 18.8 months after the procedure. The patient who relapsed the fastest was 12 months after surgery and it was a Bankart procedure.

DISCUSSION

These findings align with recent systematic reviews and comparative studies, including analyses of subgroups with subcritical bone loss and athletic cohorts.¹¹⁻²⁰

Arthroscopic Bankart repair and Latarjet reconstruction are the two most commonly used procedures to treat anterior shoulder instability. Although the Bankart technique is less invasive and has a lower risk of complications, it has higher recurrence rates, especially in cases with bone loss. In contrast, the Latarjet procedure, although more complex and associated with higher risks of complications, offers better results in terms of long-term stability.

Min et al in a prospective analysis, found that both procedures have a similar or equally effective utility score.²

Maman and colleagues in a study of 242 patients who underwent surgery for anterior shoulder instability; 27 patients underwent Latarjet and 215 underwent arthroscopic Bankart. The Latarjet group showed a significant advantage in the ASES score (91.2 versus 86.0); in this study there were no significant differences. Both procedures achieved good functional scores.¹⁵

In a study by Pugliese et al, they did a study comparing the Bankart and Latarjet procedure with an ISIS between 4 and 6; they found that the base cost of an arthroscopic Bankart procedure was 1245.57 euros (1220.48-1270.65 euros) and 1,623 euros (1580.82-1665.39 euros) for the open Latarjet. Here they showed that the treatment of anterior shoulder instability with a Latarjet procedure is more expensive compared to an arthroscopic Bankart, contrary to this study where the treatment with Latarjet was shown to be less costly.¹

However, in this same study, it was concluded that the Latarjet procedure was more cost effective in preventing recurrent dislocations and their treatment, similar to this study.¹

In this study a good result in terms of recurrences is highlighted, five patients recurred, which gives us 15% of all patients (Table 6); in the Bankart group 4 patients recurred (28%), and in the Latarjet group 1 patient recurred (5.2%). This coincides with the recurrence rate reported for these two techniques in the literature, which varies from 0 to 30% for Bankart and from 2 to 14% for Latarjet.^{11,12}

Bessière and collaborators in a retrospective study comparing both techniques found a 22% recurrence rate in the Bankart group and in the Latarjet group they found 10%. Similar values were found in this study.¹²

Bliven and collaborators in a systematic review in which 795 patients were included (Latarjet =379 and Bankart =416). Four studies report a recurrence rate of 21.1% for the Bankart procedure, which is lower than this study, and 11.6% for the Latarjet group, which was higher than what we found.¹³ Hossein Zadeh and colleagues in a systematic review analyzed the recurrence rate in the two procedures and found that patients operated with Bankart procedure have an increased risk of recurrence, like this study.¹⁴

This study had several limitations. First, the study was retrospective and not randomized. Second, the decision making at the time of indicating which surgery would be performed on each of the patients was made based on clinical criteria. Third, it was a retrospective study that can be improved in future studies by using a control group

CONCLUSION

In conclusion, although the Latarjet procedure has a significantly lower cost compared to arthroscopic Bankart surgery, both procedures show a clinically and statistically significant improvement in postoperative constant and Rowe scores. While the difference in constant scores between the two procedures is greater in favor of Latarjet, it is not statistically significant. In terms of total costs, Latarjet is more economical with no significant difference in hospitalization costs. Both treatments are effective for the clinical improvement of patients with anterior shoulder instability, with Latarjet being safer in terms of recurrence.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Pugliese M, Loppini M, Vanni E, Longo UG, Castagna A. Cost-effectiveness analysis of arthroscopic Bankart repair versus open Latarjet

- reconstruction in anterior shoulder instability. Int Orthop. 2023;47(7):1771-7.
2. Min K, Fedorka C, Solberg MJ, Shaha SH, Higgins LD. The cost-effectiveness of the arthroscopic Bankart versus open Latarjet in the treatment of primary shoulder instability. J Shoulder Elbow Surg. 2018;27(6):S2-9.
3. 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-B(9):1208-14.
4. Phadnis J, Arnold C, Elmorsy A, Flannery M. Utility of the instability severity index score in predicting failure after arthroscopic anterior stabilization of the shoulder. Am J Sports Med. 2015;43(8):1983-8.
5. Balg F, Boileau P. The Instability Severity Index Score: a simple pre-operative score to select patients for arthroscopic or open shoulder stabilisation. J Bone Joint Surg Br. 2007;89(11):1470-7.
6. IBM Corp. IBM SPSS Statistics for Windows, Version 26.0. Armonk (NY): IBM Corp.; 2019. Available in: <https://www.ibm.com/products/spss-statistics>. Accessed on 1 September 2025.
7. Maman E, Dolkart O, Krespi R, Kadar A, Mozes G, Safran O, et al. A multicenter retrospective study with a minimum 5-year follow-up comparing arthroscopic Bankart repair and the Latarjet procedure. Orthop J Sports Med. 2020;8(8):2325967120941366.
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):2345-51.
9. Bliven KCH, Parr GP. Outcomes of the Latarjet procedure compared with Bankart repair for recurrent traumatic anterior shoulder instability. J Athl Train. 2018;53(2):181-3.
10. Hossein Zadeh R, Daliri M, Sadeghi M, Sahebi M, Moradi A, Samei M, et al. Arthroscopic Bankart repair versus Latarjet procedure for recurrent shoulder instability: a meta-analysis of clinical outcomes and complication rates in general and athletic populations. J Shoulder Elbow Surg. 2024;33(12):e652-74.
11. Lho T, Lee J, Oh KS, Chung SW. Latarjet procedure for failed Bankart repair provides better stability and return to sports but worse postoperative pain and external rotation limitations with more complications compared to revision Bankart repair: a systematic review and meta-analysis. Knee Surg Sports Traumatol Arthrosc. 2023;31(8):3541-58.
12. Billaud A, Baverel L, Metais P, ReSurg, SoFEC. Arthroscopic Latarjet yields better union and prevention of instability compared to arthroscopic bony Bankart repair: a systematic review. Knee Surg Sports Traumatol Arthrosc. 2023;31(12):5994-6005.
13. Schrouff CLJH, Verlaan L. Bankart repair with remplissage versus Latarjet procedure on recurrence, postoperative pain scores, external rotation, and Rowe score in patients with a Hill-Sachs lesion: a

- systematic review. *JSES Rev Rep Tech*. 2023;3(4):461-8.
14. Delgado C, Martínez-Rodríguez JM, Candura D, Valencia M, Martínez-Catalán N, Luengo-Alonso G, et al. Arthroscopic Bankart repair versus arthroscopic Latarjet for anterior shoulder instability: a matched-pair long-term follow-up study. *Orthop J Sports Med*. 2025;13(3):23259671241313474.
15. Khan M, Bedi A, Degen R, Warner J, Bhandari M; STABLE Investigators. Multicentre randomised controlled trial comparing Bankart repair with remplissage and Latarjet procedure in shoulder instability with subcritical bone loss (STABLE): study protocol. *BMJ Open*. 2024;14(11):e089831.
16. Imam MA, Shehata MSA, Martin A, Attia H, Sinokrot M, Bahbah EI, et al. Bankart repair versus Latarjet procedure for recurrent anterior shoulder instability: a systematic review and meta-analysis of 3275 shoulders. *Am J Sports Med*. 2021;49(7):1945-53.
17. Cognetti DJ, DeFoor MT, Hartzler RU, Sheean AJ. Glenoid augmentation for subcritical bone loss: a narrative review. *Ann J*. 2024;9:15.
18. Wang L, Li Y, Fu M, Wang T, Tan H. Efficacy and safety of the Latarjet procedure for the treatment of athletes with glenoid bone defects $\geq 20\%$: a single-arm meta-analysis. *J Orthop Surg Res*. 2024;19(1):159.
19. Çağlar C, Akçaalan S, Akbulut B, Kengil MC, Uğurlu M, Doğan M. Open Latarjet reduces residual apprehension compared with arthroscopic Bankart repair for anterior glenohumeral instability. *JSES Int*. 2024;8(5).
20. Deshpande V, Barnett I, Valk J, Mathur A, Simpson E, Saunders P, et al. Similar outcomes, but significantly lower complication rate with arthroscopic Bankart repair with remplissage versus open or arthroscopic Latarjet for shoulder instability across a wide range of glenoid bone loss: a systematic review and meta-analysis. *JSES Rev Rep Tech*. 2025;5(4):778-89.

Cite this article as: Palacios MC, Hernandez RE, Arrigunaga FC, Escalante FAM, Lezcano GB. Cost-effectiveness of the arthroscopic Bankart procedure versus open Latarjet in the treatment of anterior shoulder instability. *Int J Res Orthop* 2026;12:1607-12.