

# Bankart Lesion Cases with Bone or Soft Tissue Procedure as Various Method Available: A Systematic Review

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## Abstract

**Introduction:** Bankart lesions, often seen in individuals with recurrent anterior shoulder dislocations, involve a tear in the anteroinferior glenoid labrum, particularly in athletes. Treatment varies, with soft tissue repairs like arthroscopic Bankart repair offering minimally invasive options, while bony Bankart lesions may require more complex surgeries such as the Latarjet procedure. The choice of surgery depends on the extent of the injury, patient activity, and risk of recurrence, though debate continues regarding long-term outcomes for cases with significant bone loss. This review seeks to provide clarity on the effectiveness of different surgical interventions.

**Methods:** This review searched databases like PubMed and Google Scholar using specific keywords to identify studies on Bankart lesion treatments from 2019 to 2024. Papers meeting inclusion criteria, such as randomized trials and reviews on adult interventions, were screened and selected using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method, while excluding animal studies and those involving children or the elderly.

**Results:** Initially, 1,942 papers on Bankart lesions were identified, with 354 duplicates removed. After exclusions, only 6 papers met the study's criteria and were included in the systematic review. These studies, comprising systematic reviews, case studies, and retrospective cohorts, analyzed various Bankart lesion repair techniques, with recurrent instability being the most common complication across all procedures.

**Conclusion:** Surgical methods for Bankart lesions vary, and the choice should be tailored to each patient's condition, emphasizing the need for consensus on optimal interventions.

**Keywords:** Arthroscopy, Bankart Lesion, shoulder Dislocation, Latarjet Procedure

## Introduction

Bankart lesions, common in individuals with recurrent anterior shoulder dislocations—particularly athletes—involve a tear in the anteroinferior part of the glenoid labrum. These injuries typically result from trauma or repetitive shoulder instability.<sup>1</sup> The lesion is named after the British orthopedic surgeon Arthur Bankart, who first described this injury pattern in the 1920s. Bankart lesions can present either as isolated soft tissue injuries or in conjunction with bony defects, commonly referred to as bony Bankart lesions.<sup>2</sup> The presence of bone loss complicates the clinical scenario, influencing both the treatment approach and the prognosis.

Proper treatment selection is crucial, as it directly impacts patients' quality of life, influencing shoulder stability, pain levels, and functional recovery. Accurate diagnosis and appropriate intervention are key factors

in optimizing patient outcomes, emphasizing the need for a comprehensive evaluation of treatment options. Soft tissue procedures, such as arthroscopic Bankart repair, primarily focus on reattaching the torn labrum to the glenoid rim, thereby restoring stability to the shoulder joint. This approach has gained popularity due to its minimally invasive nature, quicker recovery times, and reduced postoperative complications compared to open surgical methods. In contrast, bony Bankart lesions, which involve a fracture or significant bone loss of the glenoid rim, necessitate more complex surgical interventions. Procedures such as the Latarjet procedure or glenoid bone grafting are often employed to restore the integrity of the bony structure and prevent recurrent dislocations. These bony procedures, while more invasive, are crucial in cases where bone loss exceeds a critical threshold, as they provide

additional stability to the shoulder joint.<sup>1,3</sup>

Despite the advancements in surgical techniques, the choice of procedure remains a subject of ongoing debate among orthopedic surgeons. Factors such as the extent of the lesion, patient activity level, and risk of recurrence all play a pivotal role in determining the most appropriate treatment strategy.<sup>4,5</sup> The decision-making process is further complicated by the lack of consensus on long-term outcomes, particularly concerning the optimal management of cases involving significant bone loss. This systematic review aims to critically evaluate the various surgical methods available for treating Bankart lesions, with a focus on comparing outcomes between soft tissue and bony procedures. By synthesizing the latest evidence, this review seeks to provide clarity on the effectiveness of different surgical interventions, ultimately guiding clinicians in selecting the most appropriate treatment for their patients.

## Materials and Methods

### Search Method

In this review, we conducted a search for relevant papers using online database libraries, including PubMed, Cochrane, BMC, Medline, Elsevier, Google Scholar, and EBSCO. The search employed Boolean logic with the keywords “Bankart Lesion OR Soft Tissue Bankart Lesion OR Bony Bankart Lesion AND Open Bankart Repair OR Arthroscopic Bankart Repair OR Capsular Plication OR Labral Reconstruction OR Latarjet Procedure OR Glenoid Bone Grafting.” We filtered the search to include only papers published between 2019 and 2024.

### Selection Criteria

The inclusion criteria for this review encompassed randomized control trials, case controls, case series, prospective or retrospective control studies, literature reviews, systematic reviews, and meta-analyses. The study population was restricted to adults, both male and female. Interventions included open Bankart repair, arthroscopic Bankart repair, capsular plication, labral reconstruction, Latarjet procedure, or glenoid bone grafting. We limited our review to studies written in English and with a published status. Exclusion criteria included animal studies, descriptive studies, and studies involving children or the elderly. To minimize selection bias, author information and study affiliations were concealed.

## Data Extraction

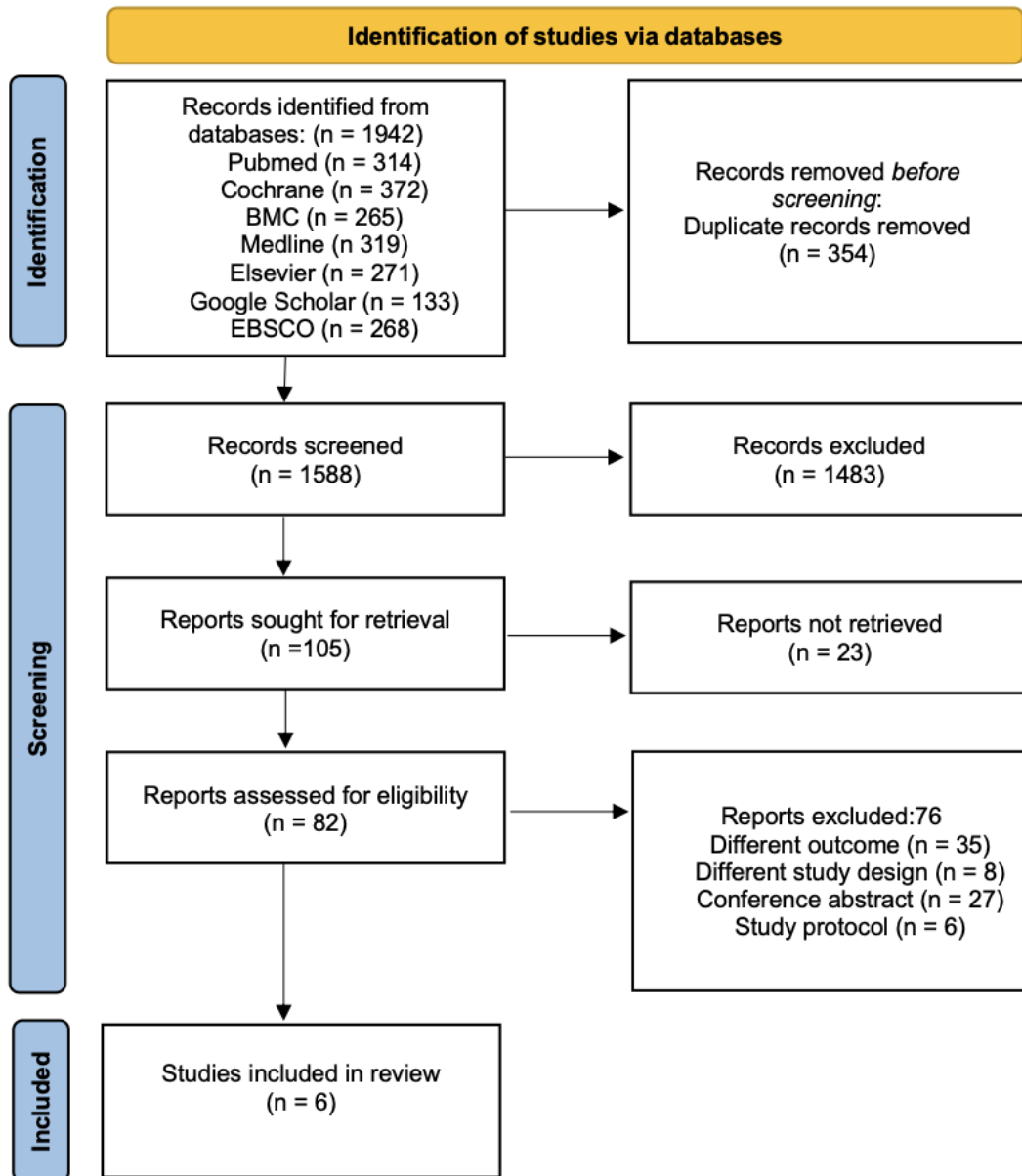
Two reviewers screened the papers based on the inclusion and exclusion criteria, eliminating studies that did not meet these criteria or were duplicates and assessing the quality of the paper by discussion until an agreement was reached. The selected papers were presented using the PRISMA method, and the studies were extracted based on predefined characteristics: author, year of publication, study design, and type of interventions.<sup>6</sup> The studies were then grouped by outcome evaluations, follow-ups, and complications.

## Results

We initially identified 1,942 papers related to bony or soft tissue Bankart lesions. Using the PRISMA method, we removed 354 duplicate papers. Out of the remaining papers, 1,483 were excluded because they did not meet the study's criteria. Twenty-three of the 105 remaining papers could not be retrieved. After assessing the eligibility of the remaining 82 papers, we excluded 76 due to differing outcomes, study designs, conference abstracts, or study protocols (Figure 1). Ultimately, we included 6 papers in this systematic review for analysis.<sup>7-12</sup>

The details of each study on the predefined characteristics of the topic of Bankart lesion were presented in Table 1. Two of the studies were systematic reviews and literature review, while the remaining two studies were case studies and retrospective cohorts. All Bankart lesion repair procedures include arthroscopic Bankart repair, open Bankart repair, anterior Bankart repair with superior capsular plication, open Bankart repair with labral reconstruction, Latarjet procedure (open coracoid transfer), bone augmentation using allograft, salvage procedures, glenoid reconstruction techniques using bone grafts, and other unnamed repairs. The clinical outcomes, follow-up results or recommendation, and complications are summarized in Table 2. The follow-up results or recommendation were found to vary depending on the type of Bankart lesion repair applied in each study. Recurrent instability is found to be the most common complication in all types of procedures.

The studies reviewed various surgical techniques for shoulder stabilization, particularly for Bankart repair and glenoid reconstruction. Arthroscopic Bankart repair improves functional outcomes with minimal complications, primarily instability recurrence. Anterior



**Figure 1.** Flow Diagram of the Selection Process.

Bankart repair with superior capsular plication enhances shoulder stability without reported complications. Open Bankart repair with labral reconstruction is preferred for lesions involving both bone and soft tissue, with follow-up recommended at 2-3 years and no reported complications. Open stabilization procedures, such as open Bankart repair, are indicated for severe instability cases, though hematomas, graft reunion failure, and osteoarthritis are common complications. The Latarjet procedure effectively stabilizes the shoulder but may still result in residual instability due to soft tissue laxity, with follow-ups suggested at 6-7 years. Lastly, both coracoid transfers

and free bone grafting are viable options for anterior glenoid rim reconstruction, with free bone grafts offering greater flexibility; however, graft resorption and osteolysis are noted complications.

The findings indicate a significant variation in treatment efficacy based on surgical approaches. Arthroscopic Bankart repair demonstrated superior results in younger patients and athletes, while open Bankart repair provided greater stability in cases with significant bone loss. Additionally, patients who underwent Latarjet procedures showed a reduced rate of recurrence but required a longer rehabilitation period.

**Table 1.** Details of Literatures on Bankart Lesion

Author	Study design	Type of interventions
Yon et al., 2020 <sup>7</sup>	Systematic Review	Patient with bony or soft tissue Bankart lesion that have gone: <ul style="list-style-type: none"> <li>• Arthroscopic Bankart repair or</li> <li>• Open Bankart repair or</li> <li>• Others unnamed repair</li> </ul>
Williams et al., 2023 <sup>8</sup>	Case Study	12 patients with Anterior Bankart lesion undergo anterior Bankart repair with superior capsular plication
Schliemann et al., 2021 <sup>9</sup>	Retrospective Cohort	110 patients with bony or soft tissue Bankart lesion that have gone: <ul style="list-style-type: none"> <li>• Open Bankart repair with labral reconstruction or</li> <li>• Classic open Bankart repair</li> </ul>
Fares et al., 2023 <sup>10</sup>	Literature Review	Patient with bony or soft tissue Bankart lesion that have gone: <ul style="list-style-type: none"> <li>• Open Bankart repair or</li> <li>• Latarjet procedure (Open coracoid transfer) or</li> <li>• Bone augmentation using allograft or</li> <li>• Salvage procedures</li> </ul>
Alkhelaifi et al., 2023 <sup>11</sup>	Literature Review	Patient with shoulder instability that has undergo Latarjet procedure
Zhang et al., 2022 <sup>12</sup>	Systematic Review	Patient with bony or soft tissue Bankart lesion that have gone glenoid reconstruction techniques using: <ul style="list-style-type: none"> <li>• Coracoid transfer or</li> <li>• Iliac crest bone graft or</li> <li>• Distal tibia allograft or</li> <li>• Clavicle bone graft or</li> <li>• Acromion bone graft or</li> <li>• Femoral condyle bone graft or</li> <li>• Proxy glenoid bone graft</li> </ul>

**Table 2.** Clinical Outcomes, Follow-ups and Complication on Bankart Lesion

Author	Outcome	Follow-up	Complication
Yon et al., 2020 <sup>7</sup>	Arthroscopic revision Bankart repair can lead to an improvement in functional outcomes and reasonable patient satisfaction with proper patient selection.	Most follow-up recommendations for arthroscopic Bankart revision are suggested at 36 - 37 months.	There was minimal complication in arthroscopic Bankart repair. The complication itself includes instability recurrence, revision procedure and other complications in order from most common complications.
Williams et al., 2023 <sup>8</sup>	Anterior Bankart repair with superior capsular plication results in an increased mean tension of the PIGHL (posterior inferior glenohumeral ligament) that contributes to shoulder stability.	No follow-up recommendations were reported in this study.	No complications were found in this study.
Schliemann et al., 2021 <sup>9</sup>	Open Bankart repair with labral reconstruction is more recommended than classic Bankart repair due to the involvement of bony and soft tissue found in the majority of Bankart lesions.	Follow-up recommendations for good functional results and stable shoulder in open Bankart repair with labral reconstruction are suggested at 2 - 3 years.	No complications were found in this study.
Fares et al., 2023 <sup>10</sup>	Open stabilization procedures including open Bankart repair are indicated for patients with	Most follow-up done in open stabilization procedures are at 14 - 15 months.	Hematomas, graft reunion failure and osteoarthritis are the most common

	recurrent instability, severe glenoid bone loss, concomitant shoulder pathologies, and high risk for failure with arthroscopic management.		complications found in open stabilization procedures.
Alkhelaifi et al., 2023 <sup>11</sup>	Latarjet procedure effectively stabilizes the shoulder joint by reattaching the labrum and the anterior capsule with the glenoid rim and the stump of the coracoacromial ligament, residual instability can still occur because of factors such as soft-tissue laxity and extensive damage to the capsule and labrum.	Six to seven years after the Latarjet procedure are the best time to re-evaluate patient satisfaction and risk for complications or failed procedures.	Recurrent instability is the most common complication in Latarjet procedure.
Zhang et al., 2022 <sup>12</sup>	Both coracoid transfers and free bone grafting procedures are options for reconstructing large bony defects of the anterior glenoid rim and have had similar clinical outcomes. Free bone grafts may offer greater flexibility in graft shaping and choice of graft size depending on the bone stock chosen.	Forty-five months are the best time to evaluate bone healing and risk of recurrent instability.	Graft resorption and osteolysis are the only complications found in glenoid reconstruction using bone graft.

## Discussion

Arthroscopic Bankart repair is often preferred for treating both bony and soft tissue Bankart lesions due to its potential for improved functional outcomes and higher patient satisfaction. This preference is supported by Hu et al., who demonstrated that arthroscopic Bankart repair outperforms conservative management in reducing recurrence rates and the need for subsequent surgeries for instability during follow-up. Immediate arthroscopic stabilization can help delay the development of chronic instability, whereas conservative treatment tends to lead to unresolved symptoms and a higher rate of subsequent instability surgeries.<sup>13</sup> Although the follow-up period in the study was relatively short, it fell within the range of previous studies, which was around 66 months. Hurley et al. noted that longer follow-up periods are associated with an increased risk of arthritis and recurrence.<sup>14</sup> Despite its benefits, arthroscopic Bankart repair carries some risks, such as instability recurrence and the need for revision surgery, along with other complications like frozen shoulder and persistent pain, though these are rare, as noted by Rodriguez et al.<sup>15</sup>

When combined with capsular plication, Bankart repair can enhance shoulder stability, as capsular plication alone may not provide sufficient stability and

can lead to recurrence. Adding capsular plication to either arthroscopic or open Bankart repair reduces capsular volume, leading to a more stable shoulder. The direction of the plication varies based on the direction of instability and the surgeon's preference, but anterior plication is commonly used to address anterior shoulder instability, as per Aydin et al.<sup>16</sup> Terra et al. added that the number of anchors and the degree of capsular plication should be tailored to the individual patient's arthroscopic findings.<sup>17</sup> Correctly determining the number of anchors and the plication direction can reduce complication rates, as capsular plication distributes loads across surrounding soft tissues, resulting in excellent outcomes and minimal complications, according to Nair et al.<sup>18</sup>

For cases involving both bony and soft tissue lesions, open Bankart repair with labral reconstruction is generally recommended. However, Latif et al. pointed out that this procedure can cause more severe postoperative pain compared to classic open Bankart repair, with the pain's severity also influenced by the location of the labral lesion.<sup>19</sup> Despite this, labral reconstruction is preferred when labral involvement is present, as Johnson et al. reported that it does not increase the severity of postoperative pain and yields similar rates of reoperation and recurrent instability,

regardless of whether knot-tying or knotless repair techniques are used.<sup>20</sup> Knotless suture anchors may improve cost-effectiveness by reducing surgical time without compromising outcomes. Lee and Shin warned that open Bankart repair might fail if labral lesions are involved and labral reconstruction is not performed, leading to poorer patient prognosis.<sup>21</sup> In such cases, labral reconstruction with knot-tying anchors is necessary, though it may reduce cost-effectiveness.

Open Bankart repair is the most common procedure for treating Bankart lesions, particularly in patients with recurrent instability, significant glenoid bone loss, additional shoulder pathologies, or a high risk of failure with arthroscopic management. According to Bitar et al., there is no significant difference in functional outcomes and range of motion between open and arthroscopic Bankart repairs.<sup>22</sup> Arthroscopic repair is often chosen for its smaller surgical wound, which maintains the skin's aesthetic appearance, but it has a higher recurrence rate, potentially due to the size of the bone defect or bone loss, as suggested by Bottoni et al.<sup>23</sup> Despite variability in measuring bony defects, significant glenoid and humeral head bone loss are major risk factors for the failure of arthroscopic Bankart procedures. Therefore, open Bankart repair is recommended for patients with multiple dislocations or significant bone loss in the glenoid or humeral head, as emphasized by Levy et al., who highlighted the importance of evaluating bone loss in patients with glenohumeral instability before surgery.<sup>24</sup> Greater bone loss indicates the need for open Bankart repair.

For achieving a more stable shoulder joint, the Latarjet procedure is advisable. Van Gerven et al. stated that the Latarjet procedure is particularly indicated for patients with recurrent glenohumeral dislocations, large Hill-Sachs deformities (>25%), off-track localization, or anterior glenoid bone loss.<sup>25</sup> This procedure provides excellent functional outcomes and low recurrence rates for recurrent shoulder instability, with success depending on the precise placement and secure fixation of the coracoid bone graft. Anjum et al. noted that the Latarjet procedure aims to reconstruct the vulnerable anteroinferior glenoid, which is often eroded or fractured in these patients.<sup>26</sup> Schrouff and Verlaan recommended the Latarjet procedure more for the first instance of a Bankart lesion than for recurrent cases, as complications such as non-union and hardware failure-related pain are more common in recurrent events.<sup>27</sup>

Bone grafting procedures are also an option for reconstructing large bony defects in both bony and soft tissue Bankart lesions. These procedures result in satisfactory clinical outcomes, good postoperative range of motion, and low rates of recurrence and complications, according to Wu et al.<sup>28</sup> When combined with Bankart repair, bone grafting effectively prevents recurrent instability in cases of joint hyperlaxity and redislocation. The grafts typically heal well and provide good stability. The extent of glenoid bone loss is closely related to clinical outcomes and recurrence rates. Currently, glenoid bone loss of 20-25% is considered an indication for bone graft reconstruction surgery, as noted by Zhou et al.<sup>29</sup> However, Lu et al. warned of potential risks, including damage to important structures attached to the coracoid process during bone harvesting, leading to shoulder dysfunction. The transfer of the coracoid process, which damages the coracoacromial ligament, can significantly impact shoulder joint stability. The complication rate after coracoid transfer is as high as 30%, with issues such as recurrent dislocations, subluxations, and revision surgeries.<sup>30</sup> To mitigate these risks, combining bone grafting with bone allograft pins is recommended, as these pins have good histocompatibility and promote graft fusion with the glenoid cavity.

The choice of surgical intervention has profound effects on patient outcomes. Arthroscopic Bankart repair is generally preferred for younger, active individuals due to its minimally invasive nature and quicker recovery time. In contrast, open Bankart repair may be more suitable for cases with extensive bone loss, as it provides enhanced joint stability. The Latarjet procedure, though associated with longer rehabilitation, offers a reliable solution for recurrent dislocations, particularly in high-risk patients.

While this review provides valuable insights, certain limitations should be acknowledged. Variability in patient demographics, surgical techniques, and follow-up durations may influence the comparability of results. Additionally, the lack of randomized controlled trials on newer surgical approaches limits definitive conclusions on long-term efficacy. Addressing these gaps in future research will help refine treatment strategies. Further research should focus on long-term comparative studies between different surgical interventions to establish standardized treatment protocols. Additionally, advancements in minimally

invasive techniques and post-operative rehabilitation strategies warrant exploration to optimize recovery and functional outcomes for patients undergoing shoulder stabilization procedures.

## Conclusion

There are various surgical methods available for managing bony or soft tissue Bankart lesions in adult patients. Each surgical option has its advantages, disadvantages, and risks of complications. The choice of surgical method should be tailored to the patient's specific condition and needs. Thus, establishing a consensus on the surgical intervention for bony or soft tissue Bankart lesions is crucial. Future studies should aim to enhance our understanding of long-term outcomes and refine surgical techniques to further improve patient care.

## Conflict of Interest

The authors declare no conflicts of interest.

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