International Journal of Research and Review
[Indexed, Peer-Reviewed Journal]
Volume 12; Issue: 12; December 2025
Website: www.ijrrjournal.com
Review Paper *E-ISSN: 2349-9788; P-ISSN: 2454-2237*

Anterior Shoulder Instability: Review of the Literature

Nugrah Ramadhan*, I Gusti Ngurah Wien Aryana**

*Resident of Orthopaedic and Traumatology, Prof Ngoerah General Hospital, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia
**Consultant of Orthopaedic and Traumatology, Prof Ngoerah General Hospital, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia

Corresponding Author: Nugrah Ramadhan

DOI: https://doi.org/10.52403/ijrr.20251229

ABSTRACT

Anterior glenohumeral instability is a common orthopedic condition characterized by abnormal translation of the humeral head relative to the glenoid, leading to recurrent shoulder dislocations. It primarily affects young, active individuals, especially males aged 16 to 20, and athletes participating in high-impact sports such as football and rugby. Traumatic events often trigger the condition, causing damage to stabilizing structures like the labrum, capsule, and rotator cuff. This instability is frequently associated with specific injuries, including Bankart lesions and Hill-Sachs lesions, which increase the risk of recurrence. Clinical evaluation, supported by imaging techniques such as X-rays, MRI, and MRA, is essential for accurate diagnosis.

Non-operative treatment, including physical therapy and immobilization, is effective in low-risk cases, aiming to restore stability and preserve range of motion (ROM). However, surgical intervention is indicated for patients with recurrent instability, significant bone loss, or structural lesions. Common surgical options include arthroscopic Bankart repair, remplissage for Hill-Sachs defects, and the Latarjet procedure for significant glenoid bone loss. The choice of management is guided by factors such as patient age, activity level, and the presence of structural abnormalities.

Early diagnosis and appropriate management are crucial to prevent long-term joint dysfunction and restore shoulder stability, especially for individuals engaged in high-demand activities. Personalized treatment plans, combining conservative and surgical approaches, offer the best outcomes for patients suffering from anterior glenohumeral instability.

Keywords: Anterior Glenohumeral Instability, Shoulder Dislocation, Bankart Lesion, Latarjet Procedure, Recurrent Instability.

INTRODUCTION

Anterior glenohumeral instability is a condition characterized by the abnormal translation of the humeral head relative to the glenoid, often resulting in dislocations of the shoulder joint. This instability typically arises from traumatic events, such as high-impact forces in contact sports or accidents. It is most common in young, active individuals, particularly males aged 16 to 20, and athletes involved in sports like football and rugby. Recurrent instability can occur when the shoulder's stabilizing structures, including the labrum, capsule, and rotator cuff, are damaged during dislocation episodes, leading to both acute pain and long-term functional impairment.

The condition is often associated with specific injuries, such as Bankart lesions

(labral tears) and Hill-Sachs lesions (humeral head defects), which increase the risk of recurrence. Anterior glenohumeral instability can be diagnosed through clinical evaluation and imaging studies like X-rays, MRI, and MRA. Treatment options range from conservative management, including physical therapy and immobilization, to surgical interventions such as the Bankart repair or Latarjet procedure, depending on the severity and recurrence of the instability. Effective management is essential to prevent long-term joint dysfunction and to restore stability for patients, especially those engaged in high-demand activities.

EPIDEMIOLOGY

Anterior glenohumeral instability is more prevalent in young, active individuals, particularly males aged 16 to 20, and athletes involved in high-impact sports. The incidence of shoulder dislocations in the general population ranges between 1% and 2%, with studies showing higher rates in males (Owens et al., 2010). A cohort study from the UK (1995–2015) revealed that 72% of dislocations occurred in men, with the highest incidence in the 16–20 age group (Shah et al., 2017). Athletes, particularly those involved in contact sports like football, rugby, and basketball, face a significantly higher risk of dislocation recurrence, with a study reporting a recurrence rate of 33–67% in young male athletes (Kraeutler et al., 2018).

In a study of military academy students, 2.8% experienced shoulder instability within one academic year, with over 85% of cases occurring in males (Kraeutler et al., 2018). Furthermore, the incidence of dislocations in rugby players was found to be as high as 15% per season, with a 55% recurrence rate among those with a previous dislocation (Moya et al., 2021). These statistics highlight the higher risk in active and contact-sport athletes, emphasizing the need for timely intervention to prevent long-term instability.

ANATOMY

Several structures that maintain shoulder stability are at risk of injury during an anterior inferior humeral head dislocation, including the glenoid labrum, glenoid bone rim, anterior capsule, and the anterior band of the inferior glenohumeral ligament. Associated injuries may also involve the subscapularis and posterosuperior rotator cuffs, as well as posterior-medial impaction on the humeral head (Hill-Sachs lesions) (Owens et al., 2010).

The shoulder joint has a wide range of motion (ROM) due to the shallow glenohumeral articulation with the nearly spherical humeral head. Its stability depends on static structures such as the glenoid labrum, joint capsule, and glenohumeral ligaments, as well as the dynamic strength coordination from the rotator cuff and proper scapular positioning (Moya et al., 2021).

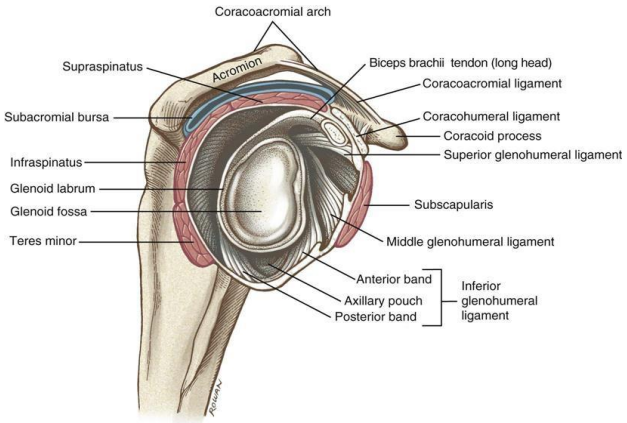

Figure 1 Glenohumeral Joint Anatomy

Glenoid

Generally, the glenoid has a pear-like shape, with an average size of 5 cm in the cranio-caudal dimension and 2.5 cm in the anteroposterior inferior dimension. This structure is relatively shallow with a 2.5 mm concavity, offering limited resistance to anterior humeral translation. However, the anteroinferior glenoid rim plays an important role in anteroinferior glenohumeral stability (Kraeutler et al., 2018).

During anterior dislocation, the glenoid rim can experience avulsion at the attachment of the anteroinferior capsulolabral complex or be impacted by the humeral head, resulting in a glenoid fracture. Biomechanical studies show that losing 20% of the anterior glenoid rim significantly reduces the force required for anterior glenohumeral translation (Shah et al., 2017).

Capsulolabral Complex

The glenoid labrum increases the surface area and depth of the glenoid socket by functioning as an anterior "shock block" for the humeral head, adding glenohumeral stability by increasing socket depth by 2.5–5 mm and creating a negative hydrostatic pressure between the humeral head and glenoid (Kraeutler et al., 2018).

The glenohumeral capsule attaches to the glenoid labrum, the articular cartilage of the humeral head, and the anatomical neck. This structure allows significant ROM, while the three primary ligaments play a role in glenohumeral stability. The superior glenohumeral ligament (SGHL) helps stabilize the long head of the biceps in mid-range motion. The middle glenohumeral ligament (MGHL) provides anterior stability during external rotation and up to 45° abduction. The inferior glenohumeral ligament (IGHL) consists of three bands—anterior, inferior, and posterior—with the anterior band being the primary restraint against anterior translation during abduction and external rotation (Moya et al., 2021).

Humeral Head

During anterior shoulder dislocation, posterior impaction of the humeral head against the anterior glenoid rim can result in a depression of the cancellous humeral bone. This Hill-Sachs lesion can lead to anterior instability, particularly when the lesion is associated with the anterior glenoid during functional ROM of the glenohumeral joint (Shah et al., 2017).

Rotator Cuff and Long Head of the Biceps

The rotator cuff plays a key role in dynamic shoulder stability. The subscapularis tendon also acts as a passive restraint against anterior translation. Anterior glenohumeral dislocation can cause injury to the rotator cuff tendons, especially in relatively older patients. Additionally, the rotator interval, including the biceps tendon, SGHL, and coracohumeral ligament, plays an important role in static glenohumeral stability in relation to the MGHL (Owens et al., 2010).

PATHOPHYSIOLOGY

Anterior glenohumeral instability is primarily the result of traumatic events that disrupt the static and dynamic stabilizers of the shoulder. The static stabilizers include the labrum, glenohumeral ligaments, and capsule, which form the passive structural support for the joint. The dynamic stabilizers, such as the rotator cuff muscles, assist in maintaining the joint's position during active movements. When a traumatic event causes anterior dislocation, the labrum is commonly torn, particularly in the anteroinferior portion, resulting in a Bankart lesion. This lesion is a major contributor to long-term instability as it compromises the glenoid's ability to securely hold the humeral head in place (Shah et al., 2017).

The humeral side of the joint is also vulnerable to injury, particularly the humeral head, which may sustain a Hill-Sachs lesion during anterior dislocations. This impaction injury to the humeral head leads to a depression in the bone, which disrupts the normal articulation between the

humerus and glenoid. These lesions can cause the humeral head to engage with the glenoid more frequently, making the joint prone to recurrent dislocations. Over time, both bony and soft tissue defects can accumulate, leading to further joint laxity and increased risk of instability (Moya et al., 2021).

The pathological cascade of instability often involves multiple components, including capsular laxity, muscle weakness, and altered scapular positioning. Capsular laxity, especially in the inferior portion, reduces the passive resistance to anterior translation, while muscle weakness, particularly in the rotator cuff, leads to poor dynamic stability. Altered scapular mechanics, such as poor scapular upward rotation and protraction, contribute to abnormal stresses on the shoulder, exacerbating instability. This multifactorial pathophysiology underscores the complexity of managing anterior glenohumeral instability, as both soft tissue and bony abnormalities must be addressed for effective treatment (Owens et al., 2010).

CLINICAL SYMPTOMS AND PHYSICAL EXAMINATION

The clinical presentation of anterior glenohumeral instability typically includes pain, weakness, and limited range of motion in the affected shoulder. Patients often report a history of shoulder dislocations or subluxations, with symptoms exacerbated by overhead activities or external rotation. The acute phase of instability is marked by severe pain, swelling, and difficulty moving the shoulder. In cases of recurrent instability, the shoulder may "give way" during routine activities, signaling the failure of both static and dynamic stabilizers (Moya et al., 2021).

A comprehensive physical examination is essential for diagnosing anterior glenohumeral instability. Key tests include the apprehension test, where the arm is externally rotated in abduction, and the relocation test, which relieves pain when the humeral head is relocated posteriorly. A positive apprehension test indicates a fear of dislocation, while the relocation test confirms the presence of instability. Other tests, such as the surprise test, can further assess the shoulder's susceptibility to dislocation and provide additional diagnostic clarity (Owens et al., 2010).

Figure 2. (a) Apprehension Test; (b) Relocation Test

Radiographic imaging and advanced techniques such as MRI and MRA play a crucial role in confirming the diagnosis and assessing the extent of soft tissue and bony damage. X-rays are used to rule out fractures, while MRI and MRA are particularly useful for visualizing labral tears and other soft tissue injuries that

contribute to instability. These imaging modalities help determine the appropriate course of treatment, whether conservative or surgical (Shah et al., 2017).

MANAGEMENT

Non-Operative Management

The primary goal of non-operative therapy after the first glenohumeral dislocation is to restore stability without pain while preserving the range of motion (ROM). This approach is preferred when the risk of recurrence is low (e.g., older age, non-contact activity, no significant bone defects) and in patients with sporadic subluxation symptoms (Hasebroock et al., 2019; Paniagua González et al., 2021). Education on activity modification and pain control (analgesics/anti-inflammatory) is provided early, followed by a structured, progressive rehabilitation program.

Immobilization with an arm sling is typically recommended for 1–3 weeks. Some studies suggest that external rotation immobilization may reduce recurrence compared to internal rotation, although this finding remains controversial and should be personalized based on patient comfort and tissue phase (Paniagua González et al., 2021). After the protection phase, therapy continues with pendulum exercises, scapular-deltioid isometrics, followed by active-assisted ROM exercises and strengthening of the rotator cuff and scapular neuromuscular control.

Criteria for returning to sports include pain-free, functional, symmetrical ROM, strength of the rotator cuff and scapular stabilizers comparable to the contralateral side, and absence of "apprehension" in high-risk positions (abduction + external rotation). While rehabilitation can be effective in many cases, recurrence remains high in young male athletes and contact sports participants (up to 33–67%), requiring close monitoring and early discussions about surgical stabilization options if re-episodes occur or if anatomical risk factors are present (Olds et al., 2019; Hurley et al., 2020).

Operative Management

Surgical indications include symptomatic recurrent instability, failure of conservative therapy, the need for rapid return to high-risk sports, and structural findings such as symptomatic Bankart lesions, HAGL lesions, "off-track/engaging" Hill-Sachs defects, or significant glenoid bone loss (Streubel et al., 2014; Hughes et al., 2021). The timing of surgery depends on factors such as age, activity demands, patient expectations, and the risk of recurrence. Modern algorithms integrate instability direction, tissue quality, and concepts such as "glenoid track" to tailor the technique (Petterson et al., 2022; Hughes et al., 2021).

The most common soft tissue reconstruction option is arthroscopic Bankart repair, often with capsular plication. This procedure is effective for unidirectional traumatic instability without significant bone loss, with good long-term outcomes in many series (Hurley et al., 2020; Murphy et al., 2019). In cases of "off-track/engaging" Hill-Sachs defects, adding remplissage (infraspinatus tendon tenodesis and capsulotenodesis to the lesion) converts the defect to an "on-track" configuration, reducing recurrence without significant functional loss in the majority of patients (Morsy, 2017; Alkaduhimi et al., 2019). HAGL lesions require selective reinsertion (either arthroscopic or open) to restore IGHL control (Streubel et al., 2014).

For significant glenoid bone loss, bone augmentation procedures are indicated. Latarjet coracoid transfer provides a bone block effect, tendon "sling" effect, and ligamentous component to enhance stability, making it the choice for glenoid defects of ≥15–25% or high-risk patterns (Woodmass et al., 2019; Petterson et al., 2022; Moya et al., 2021). Alternative bone augmentation options include Eden–Hybinette (tricortical iliac crest autograft), which remains relevant, especially after Latarjet failure or for large bone loss (Villatte et al., 2018). Distal tibia allograft replicates glenoid curvature and shows comparable clinical outcomes in selected cohorts, particularly in

revision/advanced defects (Moya et al., 2021). For multidirectional instability with hyperlaxity, procedures like inferior capsular shift or plication are aimed at reducing capsular redundancy and closing the rotator interval; however, rehabilitation remains foundational, with surgery considered for significant morbidity (Streubel et al., 2014; Paniagua González et al., 2021).

CONCLUSION

In conclusion, anterior glenohumeral instability is a significant orthopedic condition that primarily affects young, active individuals, particularly males and athletes in contact sports. The instability results from traumatic events that damage key stabilizing structures in the shoulder, including the labrum, capsule, and rotator cuff, leading to both acute pain and potential long-term disability. Effective diagnosis and management, ranging from conservative treatment to surgical interventions, are essential in preventing recurrent instability and preserving shoulder function. Advances in imaging techniques and surgical approaches have improved treatment outcomes, particularly for individuals with recurrent dislocations or associated bone defects, highlighting the importance of personalized care in achieving optimal results.

Declaration by Authors

Ethical Approval: Not required
Acknowledgement: None
Source of Funding: None
Conflict of Interest: No conflicts of interest declared.

REFERENCES

1. Owens BD, Nelson BJ, Duffey ML, et al. Pathoanatomy of First-Time, Traumatic, Anterior Glenohumeral Subluxation Events. Journal of Bone and Joint Surgery 2010; 92: 1605–1611.
2. Petterson SC, Agyapong G, Brite JE, et al. An algorithm for successfully managing anterior shoulder instability. JAAPA 2022; 35: 17–28.
3. Shah A, Judge A, Delmestri A, et al. Incidence of shoulder dislocations in the UK, / 1995–2015: a population-based cohort study. BMJ Open 2017; 7: e016112.
4. Moya D, Aydin N, Yamamoto N, et al. Current concepts in anterior glenohumeral instability: diagnosis and treatment. SICOT J 2021; 7: 48.
5. Hughes JD, Vaswani R, Paras TM, et al. Treatment Algorithm for Recurrent Anterior Shoulder Instability: Putting It All Together. Oper Tech Orthop 2021; 31: 100862.
6. Kraeutler MJ, Currie DW, Kerr ZY, et al. Epidemiology of Shoulder Dislocations in High School and Collegiate Athletics in the United States: 2004/2005 Through 2013/2014. Sports Health: A Multidisciplinary Approach 2018; 10: 85–91.
7. Kraeutler MJ, McCarty EC, Belk JW, et al. Descriptive Epidemiology of the MOON Shoulder Instability Cohort. Am J Sports Med 2018; 46: 1064–1069.
8. Leroux T, Ogilvie-Harris D, Veillette C, et al. The Epidemiology of Primary Anterior Shoulder Dislocations in Patients Aged 10 to 16 Years. Am J Sports Med 2015; 43: 2111–2117.
9. Paniagua González A, Trueba Sánchez L, Alonso García N, et al. Management of anterior glenohumeral instability without significant glenoid bone damage. Revista Española de Artroscopia y Cirugía Articular English ed; 28. Epub ahead of print 26 March 2021. DOI: 10.24129/j.reacae.28272.fs2009049.
10. Farrar NG, Malal JJG, Fischer J, et al. An Overview of Shoulder Instability and its Management. Open Orthop J 2013; 7: 338–346.
11. Streubel PN, Krych AJ, Simone JP, et al. Anterior Glenohumeral Instability: A Pathology-based Surgical Treatment Strategy. Journal of the American Academy of Orthopaedic Surgeons 2014; 22: 283–294.
12. Eshoj H, Ingwersen KG, Larsen CM, et al. Intertester reliability of clinical shoulder instability and laxity tests in subjects with and without self-reported shoulder problems. BMJ Open; 8. Epub ahead of print 1 March 2018. DOI: 10.1136/BMJOPEN-2017-018472.
13. Dumont GD, Russell RD, Robertson WJ. Anterior shoulder instability: a review of

pathoanatomy, diagnosis and treatment. Curr Rev Musculoskelet Med 2011; 4: 200–207.
14. Hippensteel KJ, Brophy R, Smith M V, et al. Comprehensive Review of Provocative and Instability Physical Examination Tests of the Shoulder. Journal of the American Academy of Orthopaedic Surgeons 2019; 27: 395–404.
15. Kompel AJ, Li X, Guermazi A, et al. Radiographic Evaluation of Patients with Anterior Shoulder Instability. Curr Rev Musculoskelet Med 2017; 10: 425–433.
16. Ikemoto RY, Nascimento LGP, Bueno RS, et al. ANTERIOR GLENOID RIM EROSION MEASURED BY X-RAY EXAM: A SIMPLE WAY TO PERFORM THE BERNAGEAU PROFILE VIEW. Revista Brasileira de Ortopedia (English Edition) 2010; 45: 538–542.
17. Burke CJ, Rodrigues TC, Gyftopoulos S. Anterior Instability. Magn Reson Imaging Clin N Am 2020; 28: 195–209.
18. Hasebroock AW, Brinkman J, Foster L, et al. Management of primary anterior shoulder dislocations: a narrative review. Sports Med Open 2019; 5: 31.
19. Hurley ET, Manjunath AK, Bloom DA, et al. Arthroscopic Bankart Repair Versus Conservative Management for First-Time Traumatic Anterior Shoulder Instability: A Systematic Review and Meta-analysis. Arthroscopy: The Journal of Arthroscopic & Related Surgery 2020; 36: 2526–2532.
20. Murphy AI, Hurley ET, Hurley DJ, et al. Long-term outcomes of the arthroscopic Bankart repair: a systematic review of studies at 10-year follow-up. J Shoulder Elbow Surg 2019; 28: 2084–2089.
21. Woodmass JM, Wagner ER, Solberg M, et al. Latarjet Procedure for the Treatment of Anterior Glenohumeral Instability. JBJS Essent Surg Tech 2019; 9: e31.
22. Villatte G, Spurr S, Broden C, et al. The Eden-Hybbinette procedure is one hundred years old! A historical view of the concept and its evolutions. Int Orthop 2018; 42: 2491–2495.
23. Morsy MG. Arthroscopic remplissage: Is it still an option? EFORT Open Rev 2017; 2: 478–483.
24. Olds MK, Ellis R, Parmar P, et al. Who will redislocate his/her shoulder? Predicting recurrent instability following a first traumatic anterior shoulder dislocation. BMJ Open Sport Exerc Med 2019; 5: e000447.
25. Alkaduhimi H, Verweij LPE, Willigenburg NW, et al. Remplissage with Bankart Repair in Anterior Shoulder Instability: A Systematic Review of the Clinical and Cadaveric Literature. Arthroscopy: The Journal of Arthroscopic & Related Surgery 2019; 35: 1257–1266.

How to cite this article: Nugrah Ramadhan, I Gusti Ngurah Wien Aryana. Anterior shoulder instability: review of the literature. *International Journal of Research and Review*. 2025; 12(12): 260-266. DOI: *10.52403/ijrr.20251229*

******