The management of traumatic shoulder instability

Salma Chaudhury

Neal Rupani

Louisa Woolley

Stephen Gwilym

Abstract

The broad range of movement of the glenohumeral joint means that anatomical or traumatic aberrations can predispose the shoulder to instability and dislocations. This pathology predominantly affects young patients, especially males, partaking in contact sports and those with hyperlaxity. Both non-operative and operative treatment strategies aim to reduce further instability episodes, which have been shown to predispose patients to early osteoarthritis. A number of patient-related and anatomical factors need to be taken into consideration when deciding between the various available management strategies, which each have their own potential complications, predisposition to recurrent dislocation and technical profiles. The degree of humeral and glenoid bone loss is a key factor in increasing the likelihood of recurrent dislocation and can therefore influence whether surgery is undertaken, or if the bone loss needs to be addressed in addition to soft tissue stabilization.

Keywords Bankart; bone block; dislocation; Latarjet; shoulder instability; stabilization

Background

Incidence

Glenohumeral joint dislocations are a relatively common pathology affecting 1.7–2.6% of the population. Shoulder dislocations most commonly occur in males, with a UK population-based study estimating the incidence to be 4% in males and 1.6% in females.[1] This is predominantly a problem faced by young patients with the peak incidence of 8.1% in 16–20-year-old males. Women have a bimodal distribution with peaks in women under 25 and those over 50 years.

***Salma Chaudhury** MA MB BChir DPhil FRCS (Orth) Clinical Lecturer in Trauma and Orthopaedics, and Oxford and Orthopaedic Lead for Undergraduate Medical Students (ORTEM), University of Oxford, UK. Conflicts of interest: none declared.*

***Neal Rupani** MRCS MSc MBBS FHEA Specialist Registrar, Nuffield Orthopaedic Centre, Oxford, UK. Conflicts of interest: none declared.*

***Louisa Woolley** MBiochem Medical Student, University of Oxford, UK. Conflicts of interest: none declared.*

***Stephen Gwilym** DPhil MBBS BSc FRCS (Tr & Orth) Associate Professor and Consultant Orthopaedic Surgeon, Nuffield Orthopaedic Centre, University of Oxford, UK. Conflicts of interest: none declared.*

Shoulder instability results in a socioeconomic burden due to disability; it can affect the ability to work and partake in leisure activities. This is particularly relevant given the number of surgical stabilizations undertaken annually and associated costs.

Recurrence

Uncertainty remains about optimal management strategies to prevent persistent instability, recurrent dislocations and long-term pathological sequelae. Risk factors for recurrent dislocations can be considered in terms of patient factors and anatomical structural factors. High recurrent dislocation rates of 72–92% have been reported, with patient-related factors including young age, male sex, contact athletes and military service personnel.[2] Predisposing structural factors include hypermobility and bone loss on either the humeral or glenoid sides. About 90% of recurrent dislocations occur within 2 years of the original injury. Identification and stratification of patients at high risk for recurrence can be achieved based on an 'instability severity index score' (ISIS), which is calculated using the risk factors of age, sporting activity, Hill–Sachs lesions, glenoid bone loss and hyperlaxity. Minimizing recurrence rates is considered a key measure of success following treatment, as well as utilization of validated patient-reported outcome measures for instability such as the Oxford Instability Score.

Long-term outcomes and complications

Despite trends in increased numbers of surgical shoulder stabilizations, there is a paucity of long-term data or population-based studies evaluating outcomes following anterior shoulder instability and anterior stabilizations. Predicting outcomes following first-time anterior shoulder dislocations and stabilization surgery was identified as a top 10 research priority by the James Lind Alliance, a priority-setting partnership involving patients, carers and clinicians. This is germane as the peak incidence of anterior shoulder instability occurs in young patients. Therefore, understanding the long-term sequelae for these young patients following surgery is important and will better inform patients and clinicians about the associated risks and long-term revision rates, which may vary according to age and gender.

The most common complications following shoulder dislocations include nerve damage, which is typically a neuropraxia of the axillary nerve, recurrent instability, long-term arthritis and fractures. Neer first described glenohumeral joint arthritis following anterior shoulder instability and coined the term 'dislocation arthropathy'. Arthritic changes have been reported after even a single dislocation event. A 25-year follow-up study of 257 first-time anterior shoulder dislocations in 255 patients reported high rates of glenohumeral arthritis, with 27% of patients demonstrating mild arthritis and 34% demonstrating moderate-to-severe arthrosis.[3] The pathophysiology of long-term arthrosis following shoulder dislocations remains poorly understood. It is not known whether it is due to the trauma of the initial dislocation, subsequent events, resultant altered glenohumeral joint and periscapular muscle biomechanics or combinations thereof.

Early-onset shoulder osteoarthritis represents an unresolved challenge due to a paucity of successful treatment options. The main treatment for advanced shoulder osteoarthritis is shoulder arthroplasty. Longer term follow-up is required to determine the true risk of long-term arthritis and other complications for a predominantly young cohort of patients, particularly as arthroplasty in younger patients is associated with poorer outcomes and higher revision rates.

Pathoanatomy

Shoulder stability is maintained by both static and dynamic stabilizers. Static stabilizers include the glenoid labrum, glenohumeral ligaments and the negative intra-articular pressure within the glenohumeral articulation. These are augmented by dynamic stabilizers such as the rotator cuff, peri-scapular muscles and the concavity-compression effect of the glenohumeral articulation. Shoulder instability stems from the imbalance between mobility and stability: the consequence of a high range of motion of the glenohumeral joint is the potential for a risk of instability leading to subluxation or dislocation.

Anterior dislocations are estimated to account for 90–95% of shoulder instability and are frequently caused by traumatic injury as well as structural bone loss or tissue hyperlaxity. Posterior instability events are more often induced by epilepsy or repetitive microtrauma.

Soft tissue pathology

Lesions of the glenohumeral joint are key to the pathoanatomy and management of traumatic shoulder instability. Simple cases of anterior shoulder instability typically involve a Bankart lesion, which is an anteroinferior labrum tear or separation from the glenoid margin. Although these lesions disrupt the volumetric size of the articulation, the principal aetiology of instability is disruption of the restraining sling mechanism provided by the inferior glenohumeral ligament and a loss of the suction effect that stems from the negative pressure within the glenohumeral articulation.

For patients above 60 years of age, injury to the rotator cuff can predominate due to underlying age-related tendon degeneration. This is more likely to be clinically relevant in younger patients, as cuff lesions may represent an acute rupture, as opposed to the situation in older patients, where there is a higher chance of finding an incidental chronic rotator cuff tear.

Other pathological lesions that can occur following traumatic shoulder instability include humeral avulsion of the glenohumeral ligaments (HAGL) and anterior labral periosteal sleeve avulsions (ALPSA).

Bone loss

The risk of anterior instability is increased by significant bone loss from either the humeral head or the glenoid.

Humeral head bone loss: Hill-Sachs lesions are a common contributor to anterior and posterior shoulder end-range instability. They are cortical depressions of the posterolateral humeral head (in cases of anterior instability), which occur as the soft humeral head is indented on the hard antero-inferior glenoid rim. These lesions are commonly encountered and have been reported as being present between 42% and 94% of patients with shoulder instability.[4] Hill–Sachs lesions can be defined as either 'on-track' or 'off-track'. On-track lesions are those posterolateral humeral head lesion which travel within the glenoid track, which is defined as the zone of contact between the glenoid and humeral head. The glenoid track is estimated to involve around 83% of the glenoid width and therefore it is postulated that the humeral head defect does not contact the anterior glenoid rim and trigger dislocation in on-track lesions. Off-track lesions are those in which the defect engages with the anterior glenoid rim during glenohumeral arc of motion and can therefore cause instability. This concept is used to help identify patients with a higher risk of recurrent dislocations who may benefit from surgical stabilization and decide whether the humeral bone defect needs addressing.

Glenoid bone loss: bony Bankart lesions are a derivative of a Bankart lesion that have associated glenoid bone loss. An average glenoid bone loss of 6.8% has been observed after primary anterior instability events, rising to 22.8% following recurrent instability events. The majority (86%) of patients with recurrent instability were found to have significant glenoid bone loss.[2]

The extent of glenoid bone loss can be calculated via two methods, typically using three-dimensional (3D) imaging in the form of CT or MRI scans. The first method is a direct comparison with the contralateral 'normal' shoulder. The alternative is using a best-fit circle method, with either a linear measurement of the width, or calculating the area loss.

Initial management

Immediate management: reduction

Numerous techniques exist to achieve closed reduction for an acute anterior shoulder dislocation. Ideally a reduction should be performed early to minimize the effects of muscle spasm, prolonged neurovascular traction and chondral damage. The techniques are largely based upon clinician preference, with three broad groups of manoeuvres being leverage, traction and scapular manipulation techniques.

Following reduction, positioning the arm in either internal or external rotation brace slings has not been demonstrated to affect the future risk of dislocation. The proposed advantage of external rotation bracing is that it better reduces the labrum to its anatomical origin. However, these splints have reduced compliance and increased costs. Duration of immobilization is based on symptoms, and the duration of immobilization is not associated with the risk of future instability events.[5] Most patients are kept in sling for 2–3 weeks owing to pain.

Following a period of immobilization, interventions aim to improve stability by strengthening dynamic stabilizers, repairing or reconstructing static stabilizers, or in some cases reconstructing dynamic stabilizers.

Investigations

Further investigation of shoulder stability is based on patient age, clinical history, examination and the requirement for information to aid surgical decision making. For patients under the age of 40, where Bankart, Hill–Sachs and HAGL lesions predominate, an MRA is the investigation of choice, with high reported sensitivity and specificity. For patients between the ages of 40 years and 60 years, simpler imaging modalities in the form of an ultrasound or MRI to evaluate the cuff is sufficient according to British Elbow and Shoulder Society (BESS) guidelines. After this age, there is a risk of picking up a non-clinically relevant rotator cuff tears, due to the increasing incidence of asymptomatic chronic rotator cuff tears in this population. Hence the further imaging in this setting is not recommended routinely.

Non-operative management

Non-operative management with physiotherapy has typically been the first line of treatment for the management of patients with a first-time dislocation and without significant bone loss. Targeted shoulder physiotherapy offers numerous important advantages, including improved post-dislocation shoulder outcome scores along with reduced costs and risks. The principal aim is to improve dynamic glenohumeral joint stability, restore joint mobility and strengthen the core and peri-scapular muscles to minimize further injury or recurrence.

Physiotherapy should entail early mobilization of the shoulder, as pain dictates. Physiotherapy protocols are variable, ranging from simple advice to repeated courses of formal therapy. The question this raises is being addressed by a multi-centred randomized controlled trial, ARTISAN, which aims to identify the optimal input and format required from a physiotherapist.

It is crucial that a shared decision-making process is maintained when opting for non-operative management, with particular considerations for a higher risk of recurrence being younger age, male, contact athletes, over-head activity and patient expectations.

Operative management

The number of surgical stabilization procedures performed annually has increased over the past two decades, particularly for anterior stabilization surgery, with the majority of procedures being undertaken arthroscopically.

Uncertainty still exists as to whether surgery should be undertaken after a primary acute traumatic dislocation or after repeated dislocations, to improve long-term outcomes. Most published studies are either small cohort series or have short-term follow-up. A number of studies have reported that surgical repair has significantly lower short- and long-term recurrence rates than non-surgical treatment, with this effect being more pronounced in younger and highly active individuals. A systematic review demonstrated that 53% of patients receiving physiotherapy following primary dislocation experienced recurrent instability.[6] Recent studies have suggested that surgical arthroscopic Bankart repair has a seven fold lower recurrence rate compared to conservative management as well as a faster return to sport.[7]

The volume of glenoid bone loss reportedly increases with each subsequent dislocation, with concerns that delaying surgery may make the subsequent operation increasingly difficult and potentially necessitate a primary bony procedure. This has added credence to consideration of early stabilization in selected patients, particularly those patients who suffer from significant bone loss with persistent apprehension or repeated instability.

Stabilization surgery can be broadly divided up in to addressing the soft tissue (capsule and labrum) or bony procedures (addressing defects in the glenoid). The indications and merits are discussed below.

Soft tissue procedures

Arthroscopic Bankart repair: arthroscopic Bankart repair, also known as capsulolabral repair, is the most commonly employed surgical intervention for cases where the anterior glenoid labrum has become detached from the glenoid. The rationale for performing surgery is that the labrum has limited tendency and potential to heal back to bone. Over time the malpositioned, torn labrum can become attenuated, with loss of the cartilage ‘bumper’, increasing the risk of repeated dislocations. The procedure aims to repair the anteroinferior labrum and inferior glenohumeral ligament to the glenoid as well as tighten the lax anterior capsule (capsular shift) using suture anchors.

Arthroscopic repairs have advantages, such as being minimally invasive with improved recovery time. A recent systematic review and meta-analysis of prospective studies reported a revision rate of 5.9% following arthroscopic stabilizations in 569 patients with predominantly 2-year follow-up data.[7] There is limited long-term outcome data at 10 years and beyond. 10-year failure-free survival rates of 70% was reported for 100 patients following arthroscopic stabilizations.[8]

Traditionally, arthroscopic Bankart repair has been recommended for patients with less than 20% glenoid bone loss, which remains the current BESS guideline. This is due to a higher risk of recurrence with greater bone loss. However, more recent studies have suggested that surgery may need to be considered at an even lower volume of bone loss, as increased risk of recurrence following arthroscopic Bankart repair reportedly occurs over 13.5% glenoid bone loss.[9] Similarly, revision arthroscopic Bankart repair is often undertaken as the primary revision option following primary failed Bankart repair, as it can provide good outcomes in cases with glenoid bone loss which equates to less than 20% and residual capsule and labrum, which can be mobilized.

Despite the increase in popularity of arthroscopic Bankart repair in particular, recurrence rates remain high at up to 18%, with the highest rates reported in younger patients.[10] Nevertheless, satisfaction rates were high (92.3%) and comparable to open repair.

Significant glenoid bone loss has been linked to worse outcomes following both arthroscopic and open Bankart repairs, and so is a key factor in considering whether this additional surgical stabilization approach should be used.

The risk of recurrence and revision varies according to patient demographic groups. The majority of stabilizations are undertaken in males, with the peak incidence in 20–24-year-old males. A systematic review of studies reporting gender effects demonstrated higher recurrent dislocation rates of 6%–37% in males (who accounted for 71.8% of 7,102 stabilizations) compared to 0–32% recurrence rates in women.[11] Younger age also correlates with higher recurrent instability and revision rates. The ISIS score can usefully stratify patients at higher risk of future instability. The 5-year risk of recurrent instability following anterior stabilization was reported as 45% recurrence for patients with ISIS scores greater than 6, 15% recurrence for scores of 4 to 6 and only a 6% recurrence rate with a score of 3 or less.[12]

ten-year follow-up of 143 arthroscopic stabilizations found a 12% arthrosis rate.[13] Another small study of 51 shoulders 9–12 years post-arthroscopic Bankart repair found 36.8% of patients had moderate to severe arthritis, along with significant bone loss in the glenoid (31.4%) and humerus (54.9%).[14]

Open Bankart repair: Bankart repairs were traditionally performed as open procedures, involving dissection of the subscapularis, but have significantly decreased in popularity and incidence following the increase in arthroscopic procedures. Randomized controlled trials comparing arthroscopic and open Bankart repairs suggested that open Bankart repair had better outcomes in terms of reduced recurrence rates despite similar quality of life scores for both procedures. One study suggested open Bankart repair almost half the recurrence risk at 11% compared to arthroscopic procedures at 23%.[15] However, a recent study found outcomes for both arthroscopic and open Bankart repair have comparable long-term (15 years) failure rates (14.3% and 12.5% respectively).[16] This might reflect recent advances in arthroscopic techniques, such as the use of modern suture anchors and suture passing devices and greater understanding of indications for soft tissue and bone block procedures. In the same study, off-track lesions were associated with increased recurrent instability in both cohorts, although no significant difference was noted between the cohorts.

Two randomized controlled trials of arthroscopic versus open stabilizations found no difference in complication rates at 2 years, although one study reported that open procedures had a significantly lower recurrence rate.[17,18] Further meta-analyses of clinical trial data comparing arthroscopic and open stabilizations concluded that open stabilizations offered greater stability and lower revision rates, while arthroscopic surgery was associated with improved movement.[19,20]

A systematic review of complications following 4362 stabilizations reported higher complication rates (excluding recurrence) of 4.4% for open soft tissue stabilizations, compared to 1.6% for arthroscopic procedures.[21] Arthroscopic and open bone block procedures were associated with the highest complication rates (13.6% and 5.3% respectively).[21] Higher nerve palsy rates have been reported following open stabilizations compared to arthroscopic procedures. Interestingly a systematic review reported that arthritis rates were unaffected by whether Bankart repairs were arthroscopic or open.[22]

Bankart repair combined with remplissage: when straightforward Bankart repairs are undertaken in the presence of Hill—Sachs lesion, there is a relatively higher recurrence rate compared to other surgical techniques. This is particularly found for off-track Hill—Sachs lesions, which have a higher failure rate than those with on track lesions. One technique for addressing this structural issue is combining a traditional Bankart capsulolabral repair with remplissage ('filling in'), where the infraspinatus is surgically attached and repaired into the humeral head defect to stabilize the Hill—Sachs lesion and minimize its risk of engaging. One systematic review found Bankart repairs combined with remplissage were effective at treating patients with Hill—Sachs lesions and up to 25% glenoid bone loss, with good outcomes for recurrent instability and functional scores.[23] Another systematic review reported a low recurrence rate of 5.8% following Bankart repairs with remplissage.[24] However, the study was underpowered to report on the effect of remplissage on glenohumeral range of motion and stiffness.

Furthermore, in the revision setting, the use of remplissage with arthroscopic Bankart repair has demonstrated positive outcomes for some cohorts. Beneficial long-term outcomes and lower recurrence rates have been reported by studies comparing isolated Bankart repairs to remplissage combined with Bankart repair following a primary failed coracoid bone block (Latarjet).

Bony procedures

Bony surgical stabilization procedures are used as the alternative to soft tissue procedures for patients with significant glenoid bone loss (>20%), large humeral head defects or where primary or revision Bankart repairs have failed. A further indication for undertaking primary bony stabilizations is for athletes with bone loss. A systematic review found that this procedure results in high rates of return to play compared to soft tissue procedures (88.8%, with 72.6% returning to the same sporting level), return rates being even higher for overhead athletes.[25]

These bony procedures are typically described as bone block procedures, and are used to augment the glenoid bone loss. The proportion of bone block procedures performed in the context of instability surgery varies, with a wide range of rates reported for American surgeons, between 2.4% and 31%.[26] Two predominant types of bone block surgery exist: a Latarjet procedure or a free bone block procedure.

Latarjet (Latarjet-Bristow): the Latarjet procedure is a popular surgical method to treat patients with anterior shoulder instability, in which the coracoid process is cut in the coronal plane and reattached. Latarjet described attaching the bone to the subscapularis muscle. The Bristow modification passes the coracoid under the subscapularis and attaches it to the anterior glenoid rim, parallel to the glenoid cavity. This procedure aims to restore stability via three methods. Firstly, it produces a sling-like dynamic stabilization effect using the conjoint tendon around the subscapularis. Secondly, it provides glenoid augmentation and increases the distance the humeral head has to travel to dislocate. Finally, it allows tightening and repair of the anterior capsule. In cases where the normally pear-shaped glenoid has a bony defect, or is an 'inverted pear' shape, the normal anatomy may not be fully restored. The coracoid process is curved or banana-shaped and thus may fail to match the flattened glenoid surface. The congruent-arc modified Latarjet technique aims to adapt to the glenoid curvature radius and increase the articular surface of the graft, by pivoting the coracoid process through 90° to optimize the contact surface.

Outcomes of the Latarjet procedure are positive, with superior outcomes reported compared to Bankart repairs, improved patient-reported scores, lower recurrent instability rates and less restricted external-rotation of the shoulder joint.[27] Systematic reviews of long-term outcomes of Latarjet report higher rates of return to sport. Latarjet repairs have been shown to be an effective treatment for females as well as males, most of the literature on this subject being focused on the latter.

However, the associated risks are higher following Latarjet procedures compared to soft tissue Bankart repairs. There is a higher reported infection risk, fractures, neurovascular damage, union and implant issues, whilst the development of osteoarthritis increases. Furthermore, Latarjet has a number of specific complications, including large bone loss and bone resorption of the coracoid graft. Hardware involved in the procedure may also dysfunction, such as screw breakage. Malpositioned bone blocks can lead to early arthritis or persistent instability. Risks of neuropraxia or injury to the axillary or musculocutaneous nerve are present. Finally, the bone block may go on to non or malunion. As the overall complication rate of Latarjet is higher than arthroscopic soft tissue surgery, BESS has not advocated this as a primary stabilization procedure in the absence of bone loss.

The Latarjet procedure can be performed open or arthroscopically. The surgical approach in terms of arthroscopic versus open Latarjet procedures has no significant impact on recurrence or complications. Arthroscopic Latarjet procedures have a greater learning curve and some studies suggest they may have higher complication rates for low-volume surgeons. Similarly to Bankart repairs, the arthroscopic procedure may allow better stabilization of intraarticular pathology and graft position, as well as preservation of the subscapularis muscle (which has to be split to reveal the glenohumeral region during open surgery). This may improve pain and recovery rates, though this has not been fully supported with high-quality evidence to date. A systematic review and meta-analysis comparing Latarjet and Bankart repairs reported lower redislocation rates following Latarjet procedures, without an increase in complication rates.[28] Revision thresholds may vary between soft tissue stabilizations and bone block procedures due to perceived differences in complexity.

The Latarjet procedure can be recommended as an option for revision surgery following failed primary arthroscopic Bankart surgery, particularly since the Latarjet procedure reconstructs the anterior glenoid arc, rather than strictly 'repairing' any labral pathology. Following the use of Latarjet as revision surgery, studies have demonstrated good functional outcomes alongside low instability recurrence and complication rates. However, when the Latarjet is compared as a primary or secondary operation following a failed primary soft tissue repair, surgical outcomes reported in the literature have been variable. One study showed significantly improved functional outcome scores in primary Latarjet compared to patients undergoing secondary Latarjet surgery following failed arthroscopic Bankart stabilization.[29] However, other studies found that there was no significant difference in recurrence and reoperation rates between patients undergoing primary and secondary Latarjet procedures, suggesting this procedure could be recommended to patients with recurrent instability requiring revision surgery.

Following failure of Latarjet surgery, in the presence of a significant Hill–Sachs lesions without significant glenoid bone loss, a combined Bankart-remplissage repair may be considered to address the humeral defect, as this can improve functional outcomes.[30]

Free bone block procedures: iliac crest bone graft (Eden–Hybinette procedure); distal tibia allograft: free bone block procedures involve the use of a bone graft to reconstruct the deficient glenoid bone stock, most often from the distal tibia or iliac crest (Eden–Hybinette), though the humeral head and femoral head have also been proposed as autograft donor sites. The iliac crest has been the donor graft of choice historically. However, there has been increasing interest in the distal tibia owing to the presence of articular cartilage.

Free bone block procedures are believed to maintain a larger internal rotation capacity compared to a Latarjet procedure. Early studies led to a preference for the Latarjet procedure over free bone block procedures for anterior shoulder instability. This was partly due to the finding that whilst bone block procedures had similar clinical outcomes to the Bristow–Latarjet procedure, the risk of recurrent instability and osteoarthritis progression was increased following a bone block procedure. Furthermore, a significant complication of free bone block procedures is donor site pain. Free bone block procedures have been recommended in patients where Latarjet is a suboptimal option, such as where the coracoid process is damaged, more than 30% glenoid width is lost, or a previous Latarjet procedure has failed.

A recent systematic review reported good outcomes for arthroscopic bone block stabilization using iliac crest and distal tibia bone grafts, with significantly improved stability scores (such as the Rowe scores), low complication rate and low recurrence in the short to mid-term. There is disparity between the use of autografts or allografts: graft resorption is twice as high for allografts (32% for allografts, as opposed to 10–16% for autografts) and graft union rates are higher for autografts than allografts (58.3–84% for autografts, as opposed to 32% for allografts). In addition, the long-term outcomes of free bone block procedures are not fully understood and necessitate further study.

Free bone block procedures are a potentially successful option for the revision of failed Latarjet procedures. The reported recurrent instability rates from free bone block revision procedures of around 8.5% are comparable to those following revisions using Bankart procedures.[31] The Eden–Hybinette procedure as revision surgery for failed Latarjet procedure on 1 year follow-up has been reported as restoring shoulder stability in 86% of patients.[32] Similarly, a small series by Provencher et al. following the use of distal tibial allografts in post-Latarjet revision surgery reported excellent clinical outcomes, with no cases of instability recurrence, and 92% glenoid-allograft osseous union at 36 months.[33]

Posterior instability

Although most of the literature concentrates on anterior shoulder instability, posterior shoulder instability accounts for around 10% of all shoulder instability events. Females are significantly more likely to experience posterior shoulder instability. There is also a higher occurrence in patients with epilepsy and in those participating in sports such as weightlifting and shooting disciplines, as well as in military populations, possibly due to specific repetitive movements such as push-ups. Repetitive microtrauma is the most common cause of posterior instability via damage to the labrum and posterior capsule. Patients with posterior instability do not typically suffer from recurrent dislocations, but more frequently present with pain.

Further causes of posterior shoulder instability can include acute traumatic posterior dislocation, which can cause disruption of the posterior chrondrolabral junction. This may be associated with a reverse Hill–Sachs lesion, where there is cortical depression of the antero-superior humeral head. Rarer causes of posterior instability include glenoid retroversion glenoid dysplasia.

In patients with low-risk for recurrence, conservative management is often considered as the first-line treatment. This is owing to posterior shoulder instability surgery having inferior outcomes and lower return to sports than anterior instability surgery. Patients at high risk of recurrent posterior instability, such as those with uncontrolled epilepsy or hyperlaxity, are at high risk of redislocations and typically have poorer outcomes following surgery. However, surgery should be considered following a course of physiotherapy, for active patients who have high recurrence risk, or with anatomic disruption in the form of labral tears or posterior capsule defects.

Many of the techniques addressing anterior shoulder instability are currently used to address posterior shoulder instability, such as posterior arthroscopic Bankart repair, with increased interest in more novel techniques such as distal tibial allograft bone block procedures.

A systematic review of arthroscopic Bankart repair for unidirectional posterior instability showed overall recurrent instability rates of 8–10%, which are comparable to those of anterior Bankart repairs.[34] Posterior arthroscopic procedures have better outcomes for posterior instability than open procedures.[34]

However, open surgical methods may be advised in patients with complex posterior instability, such as chronic locked posterior shoulder dislocation, which is at risk of going undetected and avascular necrosis occurring. As with anterior instability, patients with significant glenoid bone loss, or excessive glenoid dysplasia (retroversion $>15^o$) should not be treated with arthroscopic soft tissue repair alone owing to a high risk of recurrent instability. In this case, a posterior bone block may be considered, with options including distal tibial or glenoid allografts, pedunculated acromial graft or distal clavicle autografts. These procedures have high rates of recurrence, complications and associated osteoarthritis. Glenoid osteotomy may be recommended as a revision surgery following failed primary repair in patients with significant glenoid retroversion, but only as a last resort owing to significant rates of postoperative osteoarthritis.

Summary

In summary, shoulder instability is a relatively common pathology, which predominantly affects young males, most commonly those who are athletes. However, there can be a broad spectrum of underlying pathologies which contribute to shoulder instability, making management options more challenging. Identification of patients at high risk of recurrent instability can help to guide management and surgical approaches. Most cases requiring surgery have good outcomes following arthroscopic anterior stabilization procedures, although some high-risk patients or those with significant bone loss may be better served with a primary bone block procedure. While 90% of cases are anterior shoulder dislocations, posterior shoulder dislocations can present with greater management considerations as they are often associated with more complex pathology and anatomical variations. ◆

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