Anterior instability of the shoulder after trauma

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Anterior dislocation of the glenohumeral joint is a common injury of young people playing contact sport and may progress to recurrent episodes of symptomatic instability. The usual treatment for a primary dislocation is a short period of immobilisation followed by a programme of rehabilitation and a gradual return to full activity. An open operation to stabilise the shoulder is a successful procedure for the treatment of patients who develop recurrent instability. The advent of arthroscopic surgery, initially as a diagnostic tool, but more recently to perform therapeutic intervention, has resulted in a variety of minimally-invasive techniques for the management of instability.

Arthroscopic stabilisation done as day-care surgery offers attractive advantages over open repair such as improved cosmesis, less post-operative pain, reduced stiffness after operation and more rapid rehabilitation. As a consequence, this technique has been offered as initial treatment after a primary dislocation in an attempt to prevent subsequent instability. However, the results after this procedure have been much more variable than those for open repair.

In this review, we examine the recent advances in the understanding of the epidemiology and pathoanatomy of anterior instability of the shoulder after trauma, and compare the relative merits of arthroscopic and open stabilisation in the management of this condition.

Who is at risk of shoulder instability?

Primary anterior dislocation of the shoulder occurs commonly during contact sport in the young and after low-energy falls in the elderly. Although anterior dislocation in the aged has its own complications, recurrent instability is a particular problem in the young.

The typical patient with a high risk of developing recurrent instability is a man, either in his teenage years or early twenties, who suffers a primary dislocation while playing contact sports. The injury is usually sustained either with the arm in the ‘at-risk’ position of abduction and external rotation, or from a direct impact to the shoulder. The symptoms of instability develop during the first two years after the original dislocation.

Despite the numerous studies of the natural history after an initial traumatic anterior dislocation, the exact incidence of recurrent instability remains uncertain, with rates quoted ranging from as low as 17% to close to 100%. Many of the series which describe a high incidence have been drawn from selective populations, such as patients presenting to sports injury clinics and in military cadets, and may therefore be unrepresentative of the general population. There may also be a substantial pool of individuals who never seek medical advice, either because they sustain an isolated dislocation, become occasional dislocators, or are relatively asymptomatic and do not want surgical intervention.

An accurate reflection of the true risk in unselected populations is probably an incidence of recurrent instability of 75% to 80% among individuals aged between 13 and 20 years and of 50% in those aged between 20 and 30 years. The high rate of recurrent instability during adolescence appears to be independent of whether the proximal humeral physis is open or not. The risk begins to decline in the late twenties, although recurrent instability is not uncommon in the middle-aged or in the elderly when it may be associated with significant problems of the rotator cuff.

Although the age at the time of primary dislocation is the chief prognostic factor in determining the risk of recurrent instability, youth is also a marker for other important risk factors. These include an early return to competitive contact sports, poor compliance with rehabilitation and a greater likelihood of capsulolabral avulsion at the original dislocation. Many other factors have also been suggested as increasing the risk including a family history of recurrent instability, radio logically-visible avulsion fracture of the rim of the glenoid and a large Hill-Sachs lesion.
Re-dislocation is rare if the greater tuberosity is fractured at the time of the initial injury, but these patients typically have a more protracted recovery, as a result of secondary dysfunction of the rotator cuff and impingement. The risk of re-dislocation may also be altered by the initial treatment.

Definitions and classification

Laxity of the shoulder, which is the normal translation of the humeral head over the surface of the glenoid, should be distinguished from instability, which occurs when the degree of translation becomes excessive and leads to symptoms. Instability may vary in its degree (subluxation, dislocation and micro-instability), direction (anterior, inferior, posterior and multidirectional), aetiology (traumatic or atraumatic) and volition (voluntary or involuntary).

Two separate groups of individuals who develop glenohumeral instability can be described; namely, those who injure their shoulder (TUBS or traumatic, typically unilateral, with a Bankart lesion and usually requiring surgery to stabilise the shoulder) and those in whom instability develops insidiously as a result of an inherited constitutional ligamentous laxity (AMBRI or atraumatic, multidirectional, commonly bilateral, treatment by rehabilitation and inferior capsular shift in some refractory patients). Many of those in the latter group also have evidence of ligamentous laxity in other joints. Increasingly, these two acronyms are viewed as the ends of a spectrum of disease in which both traumatic and atraumatic elements may be present. A degree of inherited predisposition to traumatic instability is suggested by its occurrence bilaterally in a quarter of all patients, who often have a family history of recurrent dislocation. Conversely, many athletes who have evidence of constitutional ligamentous laxity only develop symptoms of instability after injury, and have predominantly unidirectional anterior instability.

It is now recognised that participants in overhead sports and athletes who throw are susceptible to a wide variety of disorders of the shoulder, including impingement dysfunction of the rotator cuff and acquired instability, which may occur concurrently to varying degrees. The classic symptoms of instability may be absent in these individuals, but if not recognised, may lead to failure of treatment.

The final group of patients with unstable shoulders are those with voluntary instability. These individuals are normally considered to be able to dislocate their shoulders at will and should be treated non-operatively. Increasingly, this view is seen as oversimplistic since some individuals may develop an acquired instability after many repetitive voluntary dislocations, and others may have an involuntary posterior ‘positional’ element to their instability, which may respond to biofeedback or, more rarely, to surgery.

Instability of the shoulder therefore encompasses a wide spectrum of conditions which can be distinguished by their aetiology, severity, constitutional factors and volition. For this reason there is no generally accepted all-inclusive system of classification and an individual or algorithmic approach to diagnosis and treatment is probably best.

The pathoanatomy of instability of the shoulder

The shallow glenohumeral joint sacrifices its stability in order to allow an extensive range of movement. The joint restraints are normally divided into static stabilisers such as the glenoid fossa, the labrum, the joint capsule and the glenohumeral ligament, and dynamic stabilisers including the rotator cuff, the long head of biceps and the stabilisers of the scapula. There is significant interaction between these restraints and their relative importance alters with changing positions of the arm. Knowledge of the anatomy and biomechanics of the shoulder has improved considerably in recent years with the increasing availability of MRI, more detailed biomechanical laboratory studies and the increasing use of arthroscopy. Studies of both normal and abnormal shoulders have allowed an improved appreciation of the complex factors contributing to glenohumeral instability. An overview of the pathoanatomy is given here, but a more extensive review of this complex area has been made by Levine and Flatow.27

The Bankart lesion, with avulsion of the anterior capsulolabral complex inferior to the equator of the glenoid, has traditionally been regarded as the essential lesion of anterior traumatic dislocation of the shoulder. Although this lesion is almost invariably present in patients with traumatic instability, it is now thought that it does not produce instability in isolation. As the arm is brought into the ‘at-risk’ position of greater abduction, the resistance to external rotation is provided by the anteroinferior structures, especially the inferior glenohumeral ligaments, which act like a hammock to retain the humeral head in place. Plastic deformation of these structures occurs during the initial dislocation before avulsion of the labrum and become progressively more severe with subsequent episodes of instability. Repair of the Bankart lesion alone is consequently thought to be insufficient to stabilise the joint and re-tensioning of the anteroinferior capsuloligamentous complex is now considered to be an important adjunctive procedure in patients with repeated episodes of instability.

There is renewed interest in the importance of the morphology of the anteroinferior part of the bony glenoid rim in glenohumeral instability. Subtraction three-dimensional CT has been used to image the glenoids of normal volunteers and patients with glenohumeral instability. Half of the latter group had an avulsion of the osseous glenoid rim, a bony Bankart lesion, and a further 40% had evidence of erosion or compression of the rim with loss of the normal ‘pear-shaped’ configuration of the glenoid. A cadaver study has shown that an osseous defect in which the width is at least 20% of the length of the glenoid can cause instability of the shoulder. Clinically, impression lesions and avulsion fractures have been associated with recurrent instability and failure of arthroscopic surgical stabilisa-
tion. Patients with large anteroinferior osseous defects of the gelenoid, the ‘inverted pear’ sign, may therefore be better served by an open bony procedure which directly addresses the defect in the gelenoid, rather than a conventional soft-tissue stabilisation.

An impression fracture of the humeral head (the Hill-Sachs lesion) is present in most patients with anterior instability. It is usually relatively small and does not contribute to instability. However, when the defect is larger and involves more than 30% of the humeral articular surface, it may ‘engage’ with the anterior gelenoid during external rotation of the shoulder causing re-dislocation.

Other lesions associated with instability have only been recognised since the development of arthroscopy of the shoulder. These include humeral avulsion of the geleno-humeral ligaments (HAGL lesion), which are typically recognised after first-time dislocations and probably represent a variant from the normal pattern of anterior capsular stretching or rupture, anterior labroligamentous periosseous sleeve avulsions (ALPSA lesion) in which the detached sleeve heals medially to the scapular neck, allowing excessive humeral translation, superior labral anterior and posterior detachment (SLAP lesion), which may occur in continuity with the inferior labral avulsion, and defects of the rotator interval. The exact importance of many of these lesions in the pathogenesis of shoulder instability is not fully understood at present.

Treatment of the initial dislocation

Clinical assessment and primary treatment. A detailed history and examination are important in the assessment of any patient presenting with a primary dislocation in the Emergency Department, with careful documentation of any neurovascular deficit. Although palsy of the axillary nerve is the most common nerve injury, many types of brachial plexus lesion and isolated nerve palsies have been described. Anteroposterior and modified axial radiographs are important in confirming the dislocation and the presence of any associated fractures before relocation. Reduction using the Hippocratic method with sedation and adequate muscle relaxation remains the most widely practised method, although many other techniques have been successfully used. After-manipulation radiographs are mandatory to confirm a congruent relocation and to reassess the position of any associated fractures.

Although some studies have suggested that prolonged immobilisation of the shoulder, restriction of activity or an intensive programme of rehabilitation may reduce the risk of recurrent instability, these measures have not been consistently effective. Restriction of shoulder movement in a sling for a period of two to three weeks followed by a graduated rehabilitation programme is the accepted management of a primary dislocation in the young patient.

During the period of immobilisation, the shoulder is normally held in the so-called ‘safe’ position of internal rotation, neutral flexion/abduction with the elbow flexed to 90°. Recent evidence has shown that immobilisation with the arm held in external rotation may reduce the risk of subsequent instability by approximating the Bankart lesion to the neck of the gelenoid giving a greater likelihood of its anatomical healing. Early comparison of the rates of secondary instability after immobilisation in either the ‘safe’ position or in external rotation have yielded promising results in favour of the latter. Patient compliance may be an issue with this form of treatment, and independent validation of the initial results is awaited.

Primary surgical management. In theory, performing an early primary stabilisation after a first-time traumatic dislocation in patients at high risk of recurrent instability is a logical procedure since the tear of the gelenoid labrum is fresh, and plastic deformation of the capsuloligamentous complex may be minimal. An open stabilisation procedure is unacceptable in most initial dislocations and has rarely been used. It was not until the development of arthroscopic techniques in the shoulder that the prophylactic surgical treatment became an option. Arthroscopic stabilisation has a higher degree of acceptability to the patient as a primary treatment, and, if delivered within two weeks of the injury, does not prolong the subsequent period of immobilisation or rehabilitation. However, the provision of an acute arthroscopic shoulder service is expensive. In addition to the training and specialist expertise, a modern arthroscopic ‘stack’ system with television monitor, a fluid-delivery pump system, arthroscopic electrocautery, instrumentation and implants are all required. The operation is often technically challenging, is not free from complications and, because of our inability to predict with certainty those who will develop instability, may be unnecessary in some patients. Proof of an economic and clinical benefit from the use of prophylactic surgery will be required for the technique to become more widely adopted as well as a cultural change towards the early referral of primary dislocators for this form of specialist surgery.

It has been suggested that early arthroscopic lavage may in itself be sufficient to reduce the risk of re-dislocation by clearing the acute haemarthrosis and joint effusion, thereby encouraging anatomical healing of the detached labrum. However, repair of the Bankart lesion to the decorticated rim of the gelenoid is the usual primary arthroscopic procedure. Repair was initially attempted using metal staples but these have been largely superceded by either custom-designed tacks or suture anchors to achieve direct repair of the labrum, or anteroposterior pull-through transglenoid sutures with knots tied either over the infraspinatus fascia or to the posterior gelenoid (Fig. 1). Many of the tacks and suture anchors are engineered from bioabsorbable materials because of concerns regarding the long-term effects of the use of metal implants in young individuals. The technology is still evolving, most notably with ‘knotless’ suture anchors and suture ‘welding’ systems, and it
seems certain that the procedure will become technically easier to perform in the future.

Arthroscopic stabilisation is often more technically challenging in the acute phase than when performed for recurrent instability (Fig. 2). Visualisation may be difficult because of the haemarthrosis, synovitis or active bleeding, and the shoulder may be relatively ‘tight’ and difficult to visualise. Rupture of the capsule may lead to excessive extravasation of arthroscopic fluid, the tissues may be friable and difficult to repair and the capsulolabral detachment may be more substantial (Fig. 3), with either global detachment extending into the superior and posterior labrum or an associated fracture of the glenoid rim.37

A number of relative contraindications to arthroscopic repair have been identified. These include ‘red-out’ at arthroscopy, usually due to active intra-articular bleeding preventing adequate visualisation and the presence of either a fracture of the greater tuberosity, a bony avulsion of the anterior glenoid rim or an HAGL lesion. Increasingly, these problems are being overcome by refinements to arthroscopic techniques.37,61-63

The results of primary surgical treatment. There are a number of concerns regarding previous studies which have examined the use of primary arthroscopic techniques. Many have been small case series without a control group. There are few comparative studies and even fewer prospective, randomised controlled trials which have compared arthroscopic stabilisation with standard non-operative treatment. Previous studies have varied widely in their criteria for inclusion and exclusion, the surgical techniques used, outcome measures, and length of follow-up. The chief outcome measure used has been the incidence of recurrent

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Diagrams of arthroscopic techniques for the treatment of anterior shoulder instability showing a) staple capsulorrhaphy, b) transglenoid suture repair, c) bioabsorbable tacks and d) suture anchors.

Diagrams of an acute arthroscopic repair using suture anchors: a) suture anchors have been placed into the anterior glenoid rim. The attached sutures penetrate the labrum and a crochet hook is used to pass one strand of the attached suture back through the anterior ‘working’ cannula to ‘capture’ the labrum; b) a knot pusher is used to tie an arthroscopic knot over the labrum; c) the completed repair.
The use of this as the benchmark of the success of the technique is somewhat simplistic, although these patients usually score poorly in terms of the other outcome measures which have commonly been used, including levels of pain, subjective instability, functional outcome and the range of the shoulder movement. A summary of the overall rates of recurrence after operation reported in the literature is shown in Table I.

Table I. Rates of recurrence after the surgical treatment of patients with primary anterior dislocations and those with recurrent instability. This is a summary of the previous English Language articles, or articles with an English language abstract, which have reported on the effects of treatment for traumatic anterior shoulder instability in terms of recurrence post-operatively. In order to find all relevant articles, MEDLINE, EMBASE, PubMed and the Cochrane Central Register of Controlled Trials were searched. In addition, abstracts from past annual meetings of the American Academy of Orthopaedic Surgeons and the Arthroscopy Association of North America were searched. Review articles and the reference lists of articles were also checked. For the open stabilisation techniques, only studies published in the last ten years were included. Studies predominantly evaluating participants with posterior instability or multidirectional instability were excluded, as were those evaluating participants undergoing revision surgery. In addition, we specified a minimum mean follow-up period of 12 months. Post-surgical recurrence has been inconsistently defined, with studies variously including patients suffering re-dislocation, re-subluxation, post-surgical pain and those exhibiting positive apprehension signs. For the purpose of this review we defined post-surgical recurrence to be either redislocation or resubluxation.

<table>
<thead>
<tr>
<th>Clinical setting</th>
<th>Type of study</th>
<th>Technique</th>
<th>Total number of patients in series</th>
<th>Total number of recurrences</th>
<th>Percentage recurrence rate (with 95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-time dislocation</td>
<td>Case-series (with no control gp)</td>
<td>Arthroscopic Bankart repair</td>
<td>170</td>
<td>13</td>
<td>7.6 (4.5 to 12.6)</td>
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<td></td>
<td>Clinical trials</td>
<td>Non-operative</td>
<td>148</td>
<td>118</td>
<td>79.7 (72.5 to 85.4)</td>
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<td></td>
<td></td>
<td>Arthroscopic Bankart repair</td>
<td>177</td>
<td>23</td>
<td>13.0 (8.8 to 18.7)</td>
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<tr>
<td>Recurrent instability</td>
<td>Case-series (with no control gp)</td>
<td>Arthroscopic staple repair</td>
<td>842</td>
<td>151</td>
<td>17.9 (15.5 to 20.7)</td>
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<td></td>
<td></td>
<td>Arthroscopic transglenoid suture repair</td>
<td>1755</td>
<td>302</td>
<td>17.2 (15.5 to 19.0)</td>
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<td></td>
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<td>Arthroscopic bioabsorbable tack repair</td>
<td>616</td>
<td>84</td>
<td>13.6 (11.2 to 16.6)</td>
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<td>Arthroscopic suture anchor repair</td>
<td>692</td>
<td>68</td>
<td>9.8 (7.8 to 12.3)</td>
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<td></td>
<td></td>
<td>Arthroscopic repairs with adjunctive procedures</td>
<td>141</td>
<td>9</td>
<td>6.4 (3.4 to 11.7)</td>
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<td></td>
<td>All arthroscopic repairs</td>
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<td>4046</td>
<td>614</td>
<td>15.2 (14.1 to 16.3)</td>
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<tr>
<td></td>
<td>Open Bankart repair</td>
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<td>1451</td>
<td>91</td>
<td>6.3 (5.1 to 7.7)</td>
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<td></td>
<td>Other open stabilisation techniques</td>
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<td>1295</td>
<td>151</td>
<td>11.7 (9.6 to 12.8)</td>
</tr>
<tr>
<td></td>
<td>All open stabilisation procedures</td>
<td></td>
<td>2748</td>
<td>242</td>
<td>8.8 (7.8 to 9.9)</td>
</tr>
<tr>
<td></td>
<td>Clinical trials</td>
<td>Open Bankart repair</td>
<td>529</td>
<td>37</td>
<td>7.0 (5.1 to 9.5)</td>
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<td></td>
<td></td>
<td>Arthroscopic Bankart repair</td>
<td>506</td>
<td>94</td>
<td>18.6 (15.4 to 22.2)</td>
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Diagrams of the variants of the Bankart lesion seen acutely showing a) an isolated Bankart lesion, b) a Bankart lesion in continuity with a SLAP lesion and c) a bony avulsion of the anterior glenoid rim (‘bony Bankart lesion’).
Primary arthroscopic stabilisation has shown no consistent benefit over non-operative treatment in terms of other functional outcomes including levels of shoulder pain, functional scores or restriction of movement.

**Surgical treatment for recurrent instability.** A programme of physiotherapy rehabilitation alone will not usually restore sufficient stability to allow an athlete with traumatic instability to return to physical contact sports.56 The mainstay of treatment in these individuals is surgical stabilisation. This may not apply to more sedentary individuals, to those with occasional symptoms of instability or to older patients. In these individuals, an initial trial of non-operative treatment including strengthening of the rotator cuff may be more appropriate.

Open surgical stabilisation. Irrespective of the exact technique used, there has been a general trend towards attempting to identify and treat the lesion responsible for instability by using anatomical repair and re-tensioning of soft tissues, rather than achieving stability through scarring or restriction of movement.

During the last 20 years, the most commonly used open technique in the treatment of recurrent anterior instability has been repair of the Bankart lesion, usually combined with an adjacent capsular shift. The deltopectoral approach is used almost exclusively, but a more cosmetic and minimally-invasive vertical skin incision extending in the skin crease from the anterior axillary fold is now recommended. Most studies advocate dissecting the subscapularis tendon as a separate layer before performing a capsulotomy. Several varieties of T-shaped, vertical or horizontal incisions have been described to perform the capsulotomy. Many variations of the Bankart repair have been used, but most surgeons now tend to favour suture anchors to secure the glenoid labrum to the decorticated anterior rim of the shoulder.

<table>
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<tr>
<th>Study</th>
<th>Non-operative n/N Rate (%)</th>
<th>Arthroscopic n/N Rate (%)</th>
<th>Relative risk (fixed) 95% CI</th>
<th>Weight (%)</th>
<th>Relative risk (fixed) 95% CI</th>
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<tr>
<td>Wheeler et al</td>
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<td>Arciero et al</td>
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<td>Sandow 1996</td>
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<td>Kirkley et al</td>
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<td>DeBerardino 2001</td>
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<td>Larrain 2001</td>
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<td>Bottino 2002</td>
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<td>Chroustovsky et al</td>
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<tr>
<td>Total (95% CI)</td>
<td>118/148 (80)</td>
<td>23/117 (13)</td>
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</tbody>
</table>

Test for heterogeneity: chi-squared=7.55, df=7 (P=0.37)
A plication is performed to re-tension the anteroinferior capsuloligamentous complex. Care must be taken not to overtighten the repair in order to avoid the restriction of external rotation post-operatively.

Many other open techniques are still widely used, with a high degree of success.67,68 The Bristow-Helfet procedure of coracoid osteotomy and fixation to the anteroinferior rim of the glenoid, although technically demanding, remains popular.69,70 Many consider that this procedure, or the use of a structural bone graft to reconstitute the rim of the glenoid, is preferable for patients with a large defect in the rim. This applies particularly to epileptics with recurrent traumatic instability who often have a large anteroinferior deficiency.71,72 In patients with large, engaging Hill-Sachs defects, allograft bone grafting or rotational osteotomy may also be considered.

**Arthroscopic stabilisation.** The arthroscopic techniques used to repair the Bankart lesion in the treatment of recurrent traumatic instability are similar to those advocated for primary stabilisation. However, in patients with recurrent instability, the anteroinferior capsule becomes progressively more attenuated with each episode of subluxation or dislocation. Tightening of the anterior capsule, achieved either by superior advancement of the labrum at the time of Bankart repair or as a separate adjunctive thermal or laser-assisted shrinkage of the anterior capsule, suture plication of the capsule or closure of the rotator interval are therefore increasingly advocated. Judging the extent to which this is required may be difficult and incurs the risk of producing excessive capsular tightness, limiting external rotation. Thermal or laser-assisted capsular shrinkage may initially reduce laxity but it may engender an increased susceptibility to creep failure at low physiological loads.73,74

**The results of stabilisation procedures for recurrent traumatic instability.** The most widely reported results using open techniques are those for the Bankart repair and are slightly better than those for other open procedures (Table I). However, combination of all the reported series using open techniques during the last ten years still reveals a rate of recurrence after operation of less than 10%. Notable success has been achieved recently using open Bankart repair to treat high-demand, collision sportsmen with unstable shoulders, with most returning successfully to high-level competition.75,76

If arthroscopic stabilisation procedures are to replace open procedures, the rates of recurrence after operation need to be similar. The overall average rate of recurrence after arthroscopic stabilisation in case series without control groups is 15.2%, compared with 6.3% for open Bankart repair and 8.8% for all open procedures (Table I). However, the rates of recurrence vary considerably between the four categories of arthroscopic techniques and there is often considerable heterogeneity in the results of studies reporting the same method. Although the rates of recurrence are greater in studies with longer follow-up, there appears to have been a gradual improvement with the use of the more modern arthroscopic techniques and implants, particularly suture anchors. The few available studies suggest that the results of arthroscopic Bankart repair with a separate adjuvant capsular tightening, either by closure of the rotator interval, capsular shrinkage or plication, may be better than a Bankart repair alone (Table I).

Most of the comparative studies have shown rates of recurrent instability to be higher after arthroscopic stabilisation than after open repair, and a meta-analysis of these series shows the risk of recurrence to be statistically significant, and more than twice that of an open procedure (Fig. 6).
Factors associated with recurrent instability after surgical repair

The factors associated with recurrent instability after surgical stabilisation may be classified into those caused by inappropriate patient selection and those attributable to surgical error.77,78 However, athletes playing contact sports may often re-injure themselves with sufficient force to redislocate their shoulder irrespective of the quality of their previous repair.77,80

Failure because of inappropriate patient selection usually results from inadequate pre-operative assessment. The most common cause of this is a failure to recognise a multidirectional or voluntary element in a patient thought to have anterior instability. The most common reason for surgical error is inadequate treatment of all the constituent components of the instability at the time of surgery. Anomalies commonly encountered at re-exploration after failed arthroscopic or open repair include an unhealed Bankart lesion,77,81 humeral avulsion of the glenohumeral ligaments,82,83 extensive glenoid erosion or deficiency from a bony Bankart lesion,38,84,85 excessive capsular laxity,81,86 a defect of the rotator interval,87 an engaging Hill-Sachs lesion,38,39 and reduced retroversion of the head of the humerus or excessive retroversion of the glenoid cavity.88

Several additional factors have been associated with recurrent instability after arthroscopic stabilisation including a younger age at surgery,89,90 non-compliance with post-operative immobilisation,84,90 early return to contact sport,86,91 absence or deficiency of the capsulolabral complex and poor inferior glenohumeral ligaments86,92 and multiple episodes of instability before stabilisation.80,93 The wide variation in the rates of recurrence after arthroscopic stabilisation may also be a reflection of the inherent technical difficulty in performing these procedures. Many authors report a steep learning curve, with patients included later in their series having a lower rate of recurrence than those treated earlier.

Although revision arthroscopic stabilisation has been described,86,94 most failed open and arthroscopic stabilisations caused by technical failure are treated by a further open procedure.95 High-quality MRI should be performed...
before re-exploration to delineate abnormalities of bone and soft tissue clearly and to help to plan surgery. An examination under anaesthesia and diagnostic arthroscopy will often provide extra information before re-exploration. Specific guidelines for the treatment of postsurgical recurrence have previously been described, but a flexible approach is important, as every case is idiosyncratic.

Other complications of surgical stabilisation

In addition to the general complications of surgery and recurrent instability, a number of other problems have been described after operative stabilisation. Following open repair, pain, loss of movement, infection, failure of the implant, neurovascular injury and late degenerative joint disease are the more commonly encountered complications. After arthroscopic stabilisation, neurovascular injury, adhesive capsulitis and synovial fistula have all been encountered. Other complications are specific to the particular technique used to repair the Bankart lesion and include loosening, breakage and impingement after the use of staples, injury to the suprascapular nerve and pain from the posterior knot after transglenoid repair; foreign-body reaction, rapid decay leading to intra-articular dissociation of the head after repair with bioabsorbable tacks; and pull-out after repair with suture anchors. These complications are comparatively rare, but often require surgical re-exploration and are associated with a poor functional outcome or recurrent instability.

Conclusions and the future

The last 20 years have seen many advances in our understanding and treatment of post-traumatic instability of the shoulder. Innovative treatments designed either to prevent or to treat recurrent instability vary from those which are relatively simple, inexpensive and require little expertise, such as, immobilisation of the shoulder in external rotation and arthroscopic washout of the shoulder alone, to the more technically-demanding and financially-burdensome procedures for arthroscopic stabilisation.

The challenge for the future rests in defining the most appropriate timing and type of intervention from the range of new and traditional options available. The current literature contains many small case series and comparative studies, but larger collaborative, randomised controlled trials are required to compare the efficacy of the newer techniques with standard treatments. The methods chosen will vary from patient to patient dependant on their age, their degree of activity and their expectations from treatment. Ultimately, a greater degree of patient empowerment in the decision-making process may be the way forward.

Until good evidence is produced to the contrary the standard method of treatment of an initial traumatic dislocation is non-operative and open repair is used to treat most patients with recurrent traumatic instability. Currently, there is some evidence that early arthroscopic stabilisation can substantially reduce the risk of recurrent instability after a primary dislocation. However, the risk of recurrence after an immediate arthroscopic stabilisation in these studies does not appear to be substantially better than that for an arthroscopic procedure to treat patients with recurrent instability. With the inherent degree of ‘over-treatment’ involved in offering an immediate arthroscopic stabilisation to all high-risk patients, an effective compromise may be to offer this procedure at a much earlier stage to those individuals who develop instability after a primary dislocation, before they have developed the degree of capsuloligamentous plastic deformation likely to compromise an arthroscopic repair.

Many patients still present late, with multiple episodes of instability, and either attenuated capsuloligamentous restraints or a deficiency of the anteroinferior glenoid rim. The results of arthroscopic stabilisation in these patients are improving with the use of newer implants and adjuvant treatment to address the problem of anterior capsular laxity. However, currently there is little evidence to support the routine widespread use of this technique over a standard open stabilisation and at the moment most patients with recurrent traumatic instability are better served by an open Bankart repair with re-tensioning of the capsule.

References


