Shoulder Dislocation

The shoulder is a ball and socket joint. However, whereas the hip has a deep socket, the shoulder socket is more shallow. This gives the shoulder a greater range of movement than the hip but, in return, it is more unstable.

The articulation of the shoulder joint is between the head of the humerus and the shallow glenoid cavity of the scapula. The glenoid cavity is deepened by the glenoid labrum (a fibrocartilaginous rim). The joint capsule surrounds the shoulder joint. The rotator cuff muscles around the shoulder are very important for protecting the joint and adding to stability.

Mechanism

- Shoulders dislocation is usually anterior (95-98% of cases). However, posterior dislocation can sometimes occur.
- Inferior, superior and intrathoracic dislocations can also occur but are rare and will not be discussed further.
- Anterior dislocation is almost invariably traumatic. It usually occurs when people fall with a combination of abduction, extension and a posteriorly directed force on the arm. A fall on to an outstretched hand is a common mechanism in the elderly. The humeral head is forced anteriorly, out of the glenohumeral joint, tearing the shoulder capsule and detaching the labrum from the glenoid. A fracture of the humeral head, neck or greater tuberosity can occur at the same time.
- Posterior dislocation is less common. It is generally caused by forces with the shoulder held in internal rotation and adduction. It may result from an epileptic fit or an electrocution or lightning injury. An unexplained posterior dislocation should raise the possibility of a convolution.
- It can occasionally occur due to a direct blow during trauma, usually associated with sport.

Epidemiology

- The glenohumeral joint is one of the most commonly dislocated joints.
- Dislocated shoulders tend to occur more often in males than in females. This is probably because of association with contact sports.
- In men, the peak age is 20-30 years and in women it is 61-80 years (due to susceptibility to falls).
- Repeated episodes of dislocation should raise the possibility of hypermobility or Ehlers-Danlos syndrome being present.

Presentation

There is usually a history of trauma with pain in the shoulder and inability to move it. There may be multiple trauma, as with a motorcycle accident, and attention to ‘Airway, Breathing and Circulation’ should always be given first.

Anterior dislocation

- The patient with anterior dislocation holds the arm at the side of body in external rotation.
- The shoulder loses its usual roundness. An anterior bulge may be seen in thinner patients. The humeral head is palpable anteriorly.
- Abduction and internal rotation are resisted.
- Check the radial pulse to assess for vascular injury.
- Check sensation in the regimental badge area on the lateral aspect of the shoulder over the deltoid muscle. This tests for axillary nerve damage. Contraction of the deltoid during attempted abduction can also be palpated.
- Assess radial nerve function: test for thumb, wrist and elbow weakness on extension as well as reduced sensation on the dorsum of the hand.
- The rotator cuff is frequently damaged and should be examined after reduction.

Posterior dislocation

- Posterior dislocation is much less obvious on examination and can easily be missed. Patients may sometimes present with a long-standing posterior dislocation.
- The patient usually presents with the arm adducted and internally rotated.
- A posterior bulge may be present and the humeral head may be palpable below the acromion process.
- Attempted abduction and external rotation are painful.
- The arm cannot be externally rotated to a neutral position.
- There is inability to supinate.
- Examination may resemble a frozen shoulder, especially with a chronic, unreduced dislocation.
- Nerve and vascular injury are not common.

Complications of anterior dislocation

- Axillary nerve damage.
- Brachial plexus, radial and other nerve damage.
- Axillary artery damage (more likely if brachial plexus injury is present - look for axillary haematoma, a cool limb and absent or reduced pulses).
- Associated fracture (30% of cases) - eg, humeral head, greater tuberosity, clavicle, acromion.
• Recurrent shoulder dislocation.
• Anatomical lesions:
  • Bankart's lesion: avulsion of the antero-inferior glenoid labrum at its attachment to the antero-inferior glenohumeral ligament complex. There is rupture of the joint capsule and inferior glenohumeral ligament injury.
  • Hill-Sachs lesion: a posterolateral humeral head indentation fracture can occur as the soft base of the humeral head impacts against the relatively hard anterior glenoid. Occurs in 35-40% of anterior dislocations and up to 80% of recurrent dislocations.
• Rotator cuff injury.

Investigations
Even if the diagnosis of dislocation is clinically obvious, the shoulder should be X-rayed to exclude an associated fracture. The exception may be a recurrent dislocation with minimal trauma.

Anterior dislocation
X-ray views for a suspected anterior dislocation should include anteroposterior (AP) plus an axillary or transscapular 'Y' view. Signs are:

• The humeral head lies under the coracoid process on the AP view.
• The axillary view shows the head of the humerus (the golf ball) anterior to the glenoid (the tee).
• The humeral head can be seen lying anterior to the 'Y' in the transscapular 'Y' view (with the glenoid at the centre of the 'Y').

Posterior dislocation
X-ray views for a suspected posterior dislocation should include AP and an axillary lateral view.

• The AP view may show the head of the humerus as its normal shape (like a walking stick). However, at other times it may resemble a lightbulb due to rotation (the lightbulb sign).
• The transscapular 'Y' view shows the head of the humerus posterior to the junction of the limbs of the 'Y'.
• The axillary view shows the head of the humerus (the golf ball) posterior to the glenoid (the tee).

Management

• Muscle spasm tends to occur soon after dislocation and makes reduction more difficult. In recurrent dislocations, some patients learn to reduce their own shoulders and do so before seeing a doctor.
• A fracture dislocation will probably require surgery.
• Without a fracture, closed reduction is usually adequate.
• Many techniques have been described for shoulder reduction. The technique used is often chosen because of clinician experience or preference.
• Adequate analgesia and relaxation are usually essential. Sedation with an opiate and benzodiazepine may be used. Emergency departments should have their own protocols.
• The patient may need to be managed before reaching hospital, or before X-ray and reduction.

First aid management
An anterior shoulder dislocation cannot be effectively immobilised with a simple sling, as the arm is locked in a degree of abduction and cannot be brought comfortably against the chest wall.

• The shoulder and arm should be splinted in the abducted position in which they are found.
• A pillow or rolled blanket can be placed in the space between the arm and chest wall for comfort and support.
• The elbow should be flexed to 90° and a sling applied to support the arm.
• The pillow and sling can be secured as a unit to the chest.

Reduction methods

• Hippocratic method:
  • The clinician holds the patient's affected arm by the wrist and applies traction at a 45° angle.
  • At the same time, they provide countertraction by placing a foot on the patient's chest wall or by having an assistant wrap a sheet around the patient's torso.
• External rotation method:
  • The patient is in a supine position on the bed.
  • The affected arm is adducted and flexed to 90° at the elbow.
  • The arm is then slowly externally rotated.
  • The shoulder should be reduced before reaching the coronal plane.
Stimson's technique:[6]  
- The patient is placed in a prone position on the bed.  
- The affected shoulder is supported and the arm is left to hang over the edge of the bed.  
- A weight is attached to the elbow/wrist. It is usual to begin with about 2 kg. Up to 10 kg may be applied.  
- Gravity stretches the muscles and reduction occurs.  
- Gentle internal/external humeral rotation may be applied.  
- This method may take 15 to 20 minutes.  
- There is now some evidence that this technique may be slightly less effective than Milch's reduction technique.[13]

Kocher's method: [14]  
- This is not frequently used because there is an increased rate of complications (risk of fracture of the humeral neck or shaft).[15]  
- Bend the arm at the elbow and press it against the body.  
- Next, rotate the arm outwards until you can feel resistance.  
- Lift the externally rotated upper part of the arm in the sagittal plane as far as possible forwards.  
- Finally, turn the arm inwards slowly.

Immediate reduction:  
- If the doctor witnesses an anterior dislocation of shoulder, perhaps during sport, and if they are satisfied that there is no significant risk of fracture, rapid reduction may be considered.[6] This provides quick pain relief and requires less force.  
- Local analgesia may be obtained by injecting 20 ml of 1% lidocaine into the joint.  
- The manoeuvre involves initial slight abduction and internal de-rotation of the affected arm. This can be done without applying a great deal of traction.  
- The shoulder is then immobilised in a sling.  
- An X-ray should still be performed post-reduction to rule out any associated fractures.

Reduction for posterior dislocation:  
- Posterior dislocation is usually amenable to closed reduction only if there is minimal displacement and it is of recent onset.  
- Otherwise, operative reduction is required, possibly with arthroplasty.

Care after closed reduction  
- Observation is needed if longer-acting sedating agents such as midazolam have been used.  
- Neurovascular assessment should be repeated.  
- A post-reduction X-ray should be taken. This can confirm adequate reduction but may also show associated injury that was not previously obvious.  
- After reduction, the shoulder is usually immobilised for 3-4 weeks, although there is evidence that those who are mobilised sooner do no worse.  
- Adequate analgesia should be given to the patient to take home.  
- Physiotherapy is usually commenced.

Surgical intervention  
- Both posterior and anterior dislocation may require surgery if a tear in the capsule prevents stable reduction or if soft tissue intervenes to prevent it.  
- Primary surgical repair: a Cochrane review supported this for young adults who have had acute traumatic shoulder dislocations and who will continue to be engaged in demanding physical activity - eg, sports, military. The review showed that this increased shoulder stability and function.[16]

Recurrent dislocation  
- Dislocation of the shoulder is often associated with damage to the joint capsule (as in Bankart's and Hill-Sachs lesions) and this can lead to instability and predispose to recurrent dislocation.  
- 80-94% of patients who have a dislocation under the age of 20 years will have a recurrence of their dislocation.  
- 26-48% of those younger than 40 years will have a recurrence.  
- 0-10% of those older than 40 years will have a recurrence.  
- A single dislocation in a young man who plays contact sport may well merit referral to an orthopaedic surgeon to assess stability of the joint with a view to a stabilisation operation. Two dislocations in a young person certainly merit referral.  
- There are several stabilisation procedures, dependent upon the nature of the lesion.

Further reading & references  
2. Anterior Instability of the Shoulder; Wheeless’ Textbook of Orthopaedics  
5. Posterior Shoulder Dislocation/Instability; Wheeless’ Textbook of Orthopaedics  
10. Bankart Lesion; Wheeless' Textbook of Orthopaedics

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