CASE REPORT

Posterior shoulder dislocation while lifting weights: a missed diagnosis

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SUMMARY

We present a case of a 24-year-old man who suffered acute shoulder pain and subsequent inability to move his arm while lifting weights in the bench-press position. He attended A&E where he was examined and X-rays were performed. He was diagnosed with presumed pectoralis major tendon rupture and was discharged to fracture clinic the following day with analgesia. On review in clinic he was found to have a posterior shoulder dislocation and was taken to theatre for relocation under anaesthesia. This case report examines the mechanism, investigations and management of posterior shoulder dislocation.

BACKGROUND

While shoulder dislocations are relatively common due to the possible range of movement of the glenohumeral joint, posterior shoulder dislocations make up only 1–4% of cases.¹ It remains an often missed diagnosis with up to 80% of diagnosis missed on initial presentation.²

The most common causes of posterior dislocation are seizures, electrocution and trauma.³ It is an important diagnosis not to miss as it may result in chronic dislocation, osteoarthritis and avascular necrosis of the humeral head.

The aim of this case report is to increase awareness of the diagnostic features, investigations and management of posterior shoulder dislocation. Furthermore, having performed a search of Pubmed we are unaware of any cases with a similar mechanism of injury.

CASE PRESENTATION

A 24-year-old male taxi driver, with a medical history of well controlled type 1 diabetes, presented to A+E with a painful right shoulder. He had been lifting weights in the gym in a bench press position (lying supine with arms fully extended and shoulders flexed). At end extension he lost control of the weight and as he strained to catch the weight he felt sudden onset right shoulder pain. He was unable to move his arm after this and attended hospital.

On further questioning he was found to be right hand dominant with no history of previous shoulder injury. X-rays revealed no fracture. The A&E team diagnosed pectoralis major tendon rupture given the mechanism of injury and pain in the shoulder and he was discharged to attend the next fracture clinic.

In the fracture clinic he was examined by an orthopaedic consultant and found to have

generalised shoulder pain and tenderness and on passive movement was unable to abduct or externally rotate his shoulder (see [figure 1](#) for clinical photo pre-reduction). He had normal neurovascular function in the affected arm.

His X-ray showed a characteristic ‘lightbulb’ sign on the anteroposterior view ([figures 2 and 3](#)) and he was diagnosed with a posterior shoulder dislocation. He was taken to theatre and the shoulder was reduced by flexing, internally rotating and adducting the shoulder—the shoulder was also found to sublux when kept in this position. He was placed in a collar and cuff and discharged with follow-up in fracture clinic.

INVESTIGATIONS

How is posterior dislocation diagnosed?

History of shoulder pain associated with seizures, electrocution or trauma should raise clinical suspicion. Positioning of the shoulder at the time of injury as above may give further clue. Any history of previous shoulder trauma or dislocation should be elicited.

Clinical suspicion is the key point to diagnosis—the patient may not present with a painful shoulder in a postictal state and shoulder movements should therefore be assessed routinely in these cases. Recognised complications of missed diagnosis include chronic posterior dislocation, degenerative disease of the shoulder and avascular necrosis of the humeral head.⁴

On inspection the patient will be holding their arm in an internally rotated position and the clinician may note posterior shoulder prominence and flattening of anterior deltoid with subsequent coracoid process prominence ([figure 1](#)). The patient will be unable to externally rotate or abduct the shoulder.³ Distal neurovascular integrity must be assessed including the axillary nerve.

X-ray's should be obtained of the anteroposterior (AP), lateral scapula and axillary views. These allow one to assess whether the humeral head is sitting in the glenoid fossa on the lateral/axillary views. Axillary views may be difficult to obtain due to loss of abduction and so modified axillary views such as Valepeau and Stripp views may be needed (patient leans back over X-ray cassette so as to get oblique AP view).

On the AP view it may be possible to see the ‘lightbulb’ sign due to the internal rotation of the humerus as illustrated in this case ([figure 2](#)).³

Other radiographic features include emptiness of the anterior glenoid fossa ([figure 3](#)) and the trough line in the humeral head caused by the impaction

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Figure 1 Clinical photo of posterior dislocation pre-reduction. Note subtle flattening of anterior deltoid (D) and prominence of coracoid process (C).

lesion.^{3 5} X-rays are also essential to rule out concomitant fractures. Advanced imaging may be necessary in unclear cases or to help plan operative intervention.

DIFFERENTIAL DIAGNOSIS

Differential diagnosis for acute shoulder pain with an inability to move the arm includes fractures, adhesive capsulitis and osteoarthritis. While fracture can be diagnosed on X-ray, the remaining differentials are mainly clinical diagnoses.

The danger of these differential diagnoses is that adhesive capsulitis and osteoarthritic pain will generally be managed conservatively initially with analgesia. If this is performed in a case of posterior shoulder dislocation, the dislocation may become chronic.

Chronic dislocation is generally classified as a dislocation lasting more than 3 weeks.³ At this point it becomes nearly impossible to reduce and requires more definitive surgical treatment or acceptance of reduced function in low demand patients.³

Figure 2 Anteroposterior X-ray of right shoulder demonstrating 'lightbulb' sign in posterior dislocation.

DISCUSSION

Mechanism of injury

In cases due to seizures or electrocution the dislocation is caused by the relative strength of the shoulder internal rotators (latissimus dorsi, pectoralis major, subscapularis and teres major) compared to the external rotators (infraspinatus and teres minor).³

The mechanism of injury in a traumatic cause is often force on an anteriorly flexed shoulder which is adducted and internally rotated, such as fall on outstretched arm or a direct blow on the anterior shoulder.⁶

Figure 3 Lateral scapula view showing emptying of the anterior glenoid.

How is it managed?

The initial management is similar to that of anterior dislocation, that is, aim to reduce the dislocation as early as possible to prevent further complications.

This is generally performed under general anaesthetic with a combination of adduction and internal flexion with axial traction on the arm.³ At this point the clinician should check for stability of the joint in various directions and secure it in a collar and cuff. If the dislocation remains irreducible using closed techniques, an open approach will be required.

Posterior shoulder dislocations are generally associated with an impression fracture of the humeral head in the anteromedial aspect (ie, reverse Hill-Sachs lesion).⁷ The size of this defect determines the stability of the shoulder and whether it can be treated with closed reduction or open reduction internal fixation.^{3 8 9}

Learning points

- ▶ Account for 1–4% of shoulder dislocations.
- ▶ Careful history of mechanism should raise clinical suspicion (including seizure, electrocution and trauma).
- ▶ Patient unable to externally rotate or abduct arm on examination.
- ▶ X-ray findings include 'lightbulb' sign.
- ▶ Prompt reduction is key.

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