Case report: posterior glenohumeral dislocation with an associated acromion fracture in a middle-aged cyclist

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INTRODUCTION

Posterior dislocation of the glenohumeral joint is uncommon,[1] this in combination with an acromial fracture is a rare presentation. The last documented presentation was in 2009 by Venuthurla,[2] who stressed the importance of computed tomography (CT) imaging. This particular case utilises magnetic resonance imaging (MRI), which enhances the imaging between different tissue types, therefore providing better assessment of associated injuries. This case is also the first to document a posterior glenohumeral joint dislocation in association with a posteriorly displaced acromial fracture, which cannot be classified into the Kuhn classification of acromial fractures.[3]

CASE REPORT

We report a case of a left-handed man who fell off his bicycle, landing on his left shoulder anteriorly. He presented to the Emergency Department (ED) that same day with left-shoulder pain and decreased range of movements. Clinical examination revealed a fixed internally rotated left arm, with swelling present around the left shoulder. Tenderness was noted around the acromioclavicular joint, and the glenoid cavity felt empty. There was also an increased prominence of the coracoid process, which we later found was due to the clavicle being displaced posteriorly with the rest of the humerus and acromion. Crepitus was present on movement. No neurovascular deficit was detectable. The patient reported no past medical history. Systemic examination was reported as normal.

Suspecting a dislocation, an anteroposterior and lateral scalpular X-rays of the left shoulder were requested. This showed a posterior dislocation of the left glenohumeral joint with 'light bulb' presentation of the proximal humeral head, and a posteriorly displaced acromion fracture at the base (see figure 1).

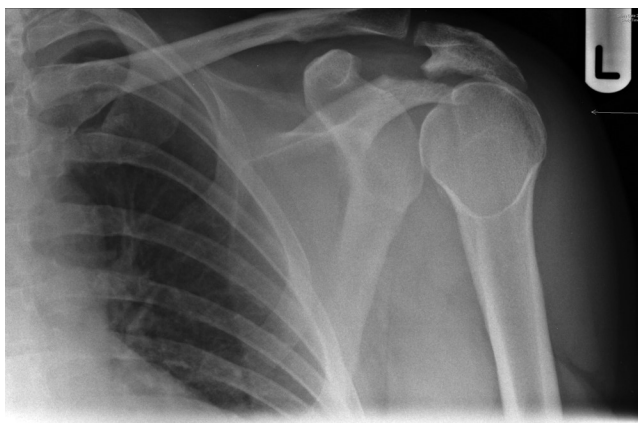

Figure 1 Anteroposterior radiograph showing acromial fracture, 'light bulb' appearance of humeral head and incongruity of glenohumeral joint articulation

The patient underwent a manipulation of his left shoulder by the on-call orthopaedic registrar under sedation using 10mg midazolam. The sedation was performed by internally rotating the shoulder to disimpact the humeral head followed by longitudinal traction and simultaneously pushing the posterior aspect of the acromion and humeral head. The arm was externally rotated to maintain the reduction. However, the reduction was unstable as it was noted as soon as the arm was internally rotated to apply the sling the shoulder redislocated. Hence the arm was held in external rotation and a spica cast applied across the trunk and mid arm to maintain the position.

Anteroposterior X-rays revealed anatomical reduction of the acromion and congruent reduction of the glenohumeral joint, with no evidence of other fractures.

A subsequent MRI scan established the extent of associated periarticular soft tissue injuries. This confirmed a fracture at the base of the acromion with no separation of the aromioclavicular joint. A severe anteromedial humeral head impaction fracture was reported with marrow oedema, which extended into the proximal humerus. Small tears were also noted in both the antero-superior and -posterior labrum. The neurovascular bundle was reported to show no injury.

The patient was subsequently referred to the regional specialist upper limb unit for opinion and conservative management. Rehabilitation during the first three weeks involved the use of an external rotation brace, with a combination of active assisted range of movement as allowed comfortably by the patient. During this period, avoidance of combined adduction and forward flexion was maintained. After three weeks, the patient was then weaned off the sling, with active range of movement as comfortably allowed, again with avoidance of combined adduction and forward flexion. Proprioceptive exercises were also commended, with minimal weight bearing below 90 degrees. After six weeks, the sling was removed completely, increasing the range of movement, and strengthening the shoulder. The patient has made a full recovery of shoulder function (see figure 2).

DISCUSSION

The glenohumeral joint is the most commonly dislocated joint managed in the ED,[4] with anterior dislocation being the most common presentation. Posterior dislocations normally occur in patients who sustain violent muscle contraction from seizures or electrical shock. They may also occur after an impact to the

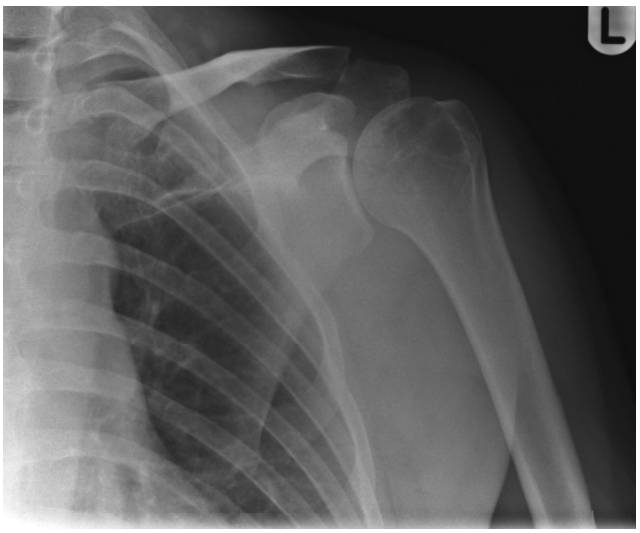

Figure 2 Anteroposterior radiograph at six months post injury, showing union of acromial fracture and located humeral head

anterior aspect of the shoulder. Posterior dislocations only account for up to 4% of all shoulder dislocations.[1] Even rarer still are acromion fractures, which account for less than 1% of all fractures.[5] Only three cases of combined posterior glenohumeral dislocation and associated acromial fracture have been reported to date in journals published in the English literature.

A case was reported in 1996 of a 14-year-old boy who presented with a posterior dislocation complicated by a fracture of the acromion.[6] Management in this case involved manual reduction (under general anaesthetic) with truncal plaster cast fixation.

The second reported case was in 1998,[7] where this combination of injuries was noted in a patient where direct impact injury led to a posterior dislocation with a Type II acromion fracture.[3] Management was via prompt closed reduction by adduction and in-line traction which resolved the dislocation. This was then followed by an elective open reduction internal fixation with a low-profile AO-type calcaneal plate of the displaced acromial fracture, with the patient post-operatively managed in a sling.

The last known case was reported in 2009 by Venuthurla, who reported a man who sustained a direct impact injury after being hit by a car.[2] In this case manipulation of the dislocation was carried out under intravenous analgesia and sedation without success. General anaesthesia was then opted for, which allowed easy reduction without complications, the fractured acromion was conservatively managed by immobilisation in a sling for three weeks, followed by physiotherapy. No details of the approach used for the acromial fracture fixation were given. The authors in this case emphasised the use of CT scan in diagnosis and identification of associated injuries. In all three cases, a full range of movement was later gained without any clinical complications.

We concur with the above authors that use of a series of radiographs (anteroposterior, lateral scapular and axial) is advisable to avoid missing the diagnosis of a posterior dislocation. Where pain precludes a standard axial view, a 'strip axial' or 'velpeau axillary lateral' view is a helpful alternative view that allows a reliable view of the glenohumeral articulation to be obtained without having to move the limb for positioning prior to this view. CT is helpful in assessing the associated bony acromial injury, but the alternative use of an MRI scan, as in our case, allowed a better assessment of associated capsular, muscular and labral injuries. It would also potentially be of benefit if a neurovascular injury was suspected. T2-weighted scan was particularly useful as the amount of oedema around the joint could also be viewed.

The importance of a thorough clinical examination cannot be stressed enough as this was the key in raising suspicions of this injury in our case. With posterior dislocations, suspicions should be raised by the inability of the patient to externally rotate and direct palpation of the glenoid reveals and empty socket.

The Kuhn classification of acromion fractures proposes three groups:[3]

- Type I fractures with minimal fracture displacement
- Type II with the fracture fragment displaced laterally, superiorly or anteriorly but without compromise of the subacromial space
- Type III fractures, where the subacromial space is compromised and reduced

Our case involved a posteriorly displaced acromion fracture with a posterior glenohumeral dislocation, which did not easily correspond to any of the proposed groups and could, in theory, be considered either a subtype of the Kuhn Type II group or be considered a separate subgroup, which we would call a Type IV group, describable as a posteriorly displaced acromial fracture without subacromial space compromise.

ACKNOWLEDGEMENT

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