



Case report

Superior shoulder suspensory complex fracture dislocation case report

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ABSTRACT

Background: Acromioclavicular joint dislocation can be more complex than it first appears. The presented case had an unusual combination of injuries to the superior shoulder suspensory complex, which yielded some interesting learning points.

Case summary: The injuries were sustained after a fall from a push bike and included acromioclavicular dislocation with coracoid process, clavicle and acromion process fractures. These were identified on the initial X-ray examination, which was followed by computed tomography for surgical planning. The injuries were successfully treated by internal fixation.

Conclusion: The unexpected complexity of the injuries could have led to subtle but important findings being overlooked. This case highlights the importance of a thorough search strategy, consideration of injury biomechanics and knowledge of associated injuries.

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Introduction

Acromioclavicular joint (ACJ) subluxation or dislocation is a relatively common injury of the shoulder although sometimes this can be more complex than it first appears.¹ The bone and soft tissue ring of the shoulder girdle is described as the superior shoulder suspensory complex; this includes the glenoid process, the clavicle and its acromioclavicular ligament attachment to the acromion process, and the coracoid process and its coracoclavicular ligament attachment to the clavicle.² The presented case had a complex injury to this structure including Rockwood Type III ACJ dislocation combined with each of the described associated fractures; acromion process, clavicle and coracoid process.³

Discussion

Clinical presentation and examination

The patient presented to the emergency department after falling from a push-bike onto his shoulder. An emergency nurse practitioner (ENP) took a clinical history and performed a clinical

examination. On inspection there was local pain, swelling and deformity to the superior shoulder. The arm was held to the chest, protected from movement, and was too tender to allow full palpation or range of movement assessments. The outer third of the clavicle was particularly painful to palpate and abduction was also painful. Although, the examination was incomplete the ENP was able to localise the patient's pain to the superolateral shoulder area and the clinical features were characteristic of ACJ dislocation.³ On the basis of the findings the ENP requested a shoulder X-ray examination to look for any dislocation or fracture.

Diagnostic imaging

The X-ray examination began with an anteroposterior shoulder projection on which the radiographer identified that the ACJ was dislocated with the inferior border of the outer end of the clavicle being superiorly displaced from the acromion process (Fig. 1). Due to their suspicion of clavicle and coracoid process fractures, the radiographer performed a cranially angulated anteroposterior clavicle projection (Fig. 2). The coracoid process is an anterior bony projection of the superoanterior aspect of the scapula, which can be difficult to visualise on standard anteroposterior shoulder projections; an anteroposterior projection with 35° or more cranial angulation and axial shoulder projection are required to see it clearly.^{4,5} In this case, the cranially angulated projection demonstrated a minimally displaced fracture at the superior aspect of the outer end of the clavicle and a fracture of the base of the coracoid

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Figure 1. Initial X-ray examination images. Anteroposterior shoulder projection.



Figure 2. Initial X-ray examination images. Cranially angulated anteroposterior clavicle projection.

process, which was markedly displaced from its normal position attached to the scapula. The modified axial projection also demonstrated an undisplaced acromion process fracture (Fig. 3). A subsequent true axial projection demonstrated the anterior displacement of the coracoid process fragment and also showed that there was no significant anterior or posterior displacement of the ACJ dislocation (Fig. 4).

The superimposed clinical manifestations of the injuries sustained demonstrate the importance of performing relevant projections and not prematurely ending the examination after identifying an abnormality on the anteroposterior projection. Each



Figure 3. Initial X-ray examination images. Modified axial shoulder projection.



Figure 4. Initial X-ray examination images. True axial shoulder projection.

projection unveiled a different injury, which may have otherwise been missed. When interpreting the radiographic images, the unexpected complexity of the injuries sustained combined with satisfaction from identifying the ACJ dislocation could have led to significant injuries being overlooked, highlighting the importance of using a thorough systematic search strategy, considering injury biomechanics and knowing about associated injuries.⁶

Coracoid process fractures are uncommon but can occur with ACJ dislocation.^{3,4} The main mechanisms postulated to cause coracoid process fractures are: superior avulsion by the coracoclavicular ligament in ACJ dislocation, direct blow to the superior shoulder region, extreme sudden traction avulsion through the biceps or coracobrachialis muscle attachments or collision from the humeral head in anterior dislocation.^{6–8} In this case, the patient's description and radiographic findings suggested that the injuries were caused by a direct anterior blow to the superior shoulder suspensory complex.

The reporting radiographer practitioner identified the abnormalities and discussed the case with the ENP. The patient was urgently referred to fracture clinic with a computed tomography (CT) scan booked and the injured shoulder immobilised in a sling. The CT scan revealed no further scapula fractures that would change the surgical treatment and also provided three dimensional reconstructions for orthopaedic surgical planning (Fig. 5).

Injury classification

A number of classification systems could have been applied to this injury depending on whether the coracoid process fracture or ACJ dislocation was considered the primary injury. Coracoid process fractures may be classified as posterior (type I) or anterior (type II) to the coracoclavicular ligament, with type II only requiring conservative treatment and type I requiring consideration for surgical treatment.⁹ Our case could be described as a type I coracoid process fracture; however, this does not convey the full extent of the injuries that were sustained.

This case probably fits best with a more detailed Rockwood type III ACJ injury classification description that includes possible associated fractures of the lateral clavicle, acromion process or coracoid

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