A type VI acromioclavicular joint injury: subcoracoid dislocation in a patient with polytrauma

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ABSTRACT

The Rockwood type VI acromioclavicular joint injury describes subcoracoid dislocation of the distal end of the clavicle. This injury pattern is exceedingly rare, with only 12 cases described in the literature. Diagnosis can be challenging; it is often the result of a high-energy mechanism and patients frequently have other severe distracting injuries. We report the case of a 23-year-old man who presented to our department after falling from a fifth-floor balcony. Alongside multiple intra-abdominal and musculoskeletal injuries, the patient sustained a type VI acromioclavicular joint dislocation. This injury was not picked up on the initial clinical assessment or described in the initial radiology report, with the diagnosis only made upon subsequent repeat review of the imaging by the admitting team. Fortunately, this delay did not increase the time to the patient receiving appropriate treatment. Despite its rarity, awareness of this injury pattern and its association with polytrauma is essential to reduce the risk of the diagnosis being overlooked in the acute setting.

KEYWORDS

Type VI acromioclavicular joint injury – Subcoracoid dislocation – Polytrauma

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Background

We present a case of a Rockwood type VI acromioclavicular joint (ACJ) injury in the context of polytrauma. This injury involves subcoracoid dislocation of the distal end of the clavicle. It is typically the result of a high-energy mechanism involving a combination of extreme abduction and external rotation of the shoulder.^{1–5} This type of injury is extremely rare. Since it was first described in 1967,⁴ there have only been 11 other cases reported. Clinical diagnosis can be challenging. Initial clinical findings can be subtle. Owing to the association with high-energy trauma, patients often present with multiple other concurrent musculoskeletal injuries.^{1,3,5} A delay in reduction of the dislocation can lead to osteolysis of the clavicle; early open reduction and fixation are recommended to achieve an optimal functional outcome.^{3,5} In the context of polytrauma, maintaining a high index of suspicion during clinical and radiological assessment is essential to prevent missed or delayed diagnosis of this injury.

Case history

A previously fit and well 23-year-old man presented to our major trauma centre after falling from a fifth-floor balcony. Injuries initially identified from the primary survey and

computed tomography (CT) consisted of an injury to the liver, right kidney and transverse process fractures at L1–L3. He had bilateral upper limb injuries including a closed fracture of the left distal radius and ulnar styloid process. His right upper limb injuries included an extra-articular fracture of the scapula, a complex open fracture of the olecranon, fracture dislocations of the fourth and fifth carpometacarpal joints, fractures of the hamate and triquetrum and an ulnar artery injury at the level of these carpal fractures.

While not described within the initial CT report, upon later repeat review of the images by the admitting orthopaedic team a right subcoracoid ACJ dislocation was identified (Figures 1–5).

Focused examination of the right upper limb and ACJ found the skin to be intact with no motor or sensory deficit distally. Because of the severity of the concomitant injuries to the right upper limb, it was not possible to assess the range of movement at the shoulder at this stage.

The intra-abdominal injuries, transverse process fractures and scapular fracture were all managed conservatively. Definitive surgery for the injuries to both wrists and the right olecranon was performed on a joint orthopaedic-plastics list at day 3 post-injury. On day 6 post-injury the patient was taken to theatre again to address the type VI right ACJ injury, which required open reduction and reconstruction

using a suspensory implant. At postoperative week 15, the patient was noted to be progressing well with physiotherapy. Plain radiographs showed maintained alignment at the ACJ (Figure 4). Unfortunately, longer-term follow-up was not possible as the patient returned to his native country before attending any further outpatient assessments or physiotherapy appointments.

Discussion

We present a case of a rare Rockwood type VI ACJ injury, where the diagnosis was not obviously apparent clinically and was initially overlooked on trauma imaging. Type VI injuries involve subcoracoid dislocation of the clavicle and can occur with or without an associated clavicle shaft fracture. They are often the result of high-energy injuries involving forceful abduction and external rotation of the arm.³

If not considered in the differential diagnosis and specifically looked for on imaging studies, the potential lack of or relatively minimal clinical signs on examination combined with other distracting injuries or reduced Glasgow Coma Scale score can make this type of injury easy to miss. There are several case reports where, in the context of polytrauma, the diagnosis has been overlooked at initial presentation leading to a subsequent delay in treatment. Neumann *et al* report the case of a patient who sustained multiple musculoskeletal injuries in a high-speed road traffic collision.⁵ The patient had both a closed femoral fracture and an open humeral fracture and was discharged 12 days after presentation after successful surgical management of these injuries. It was only at clinic review eight weeks later where a complaint of worsening right shoulder pain led to further investigation and diagnosis of a subcoracoid ACJ dislocation.⁶ A similar case of delayed diagnosis in a patient following major trauma was described by Torrens *et al*.³ Their patient was similarly treated for multiple injuries following a road traffic collision, however a subcoracoid ACJ dislocation was only discovered one year later after continuing pain and restriction of movement in the left shoulder prompted CT examination.³ Long delays in treatment can lead to

Figure 1 Plain radiograph of the right shoulder taken on presentation

Figure 3 Three-dimensional reconstruction of the computed tomography of the thorax taken on presentation

Figure 2 Axial and coronal plane images from the computed tomography of the thorax with contrast taken on presentation

Figure 4 Plain radiographs of the right shoulder taken on postoperative day 1

osteolysis of the lateral aspect of the clavicle thus prompt recognition and intervention is advised.^{3,4} Our patient's dislocation was identified very shortly after the CT had been reported and there was fortunately no delay in him receiving appropriate treatment.

Based on the existing literature, polytrauma seems to be a risk factor for the presentation of this rare type of ACJ injury. We believe that, while rare, it is an important injury pattern for clinicians working within Orthopaedics or as part of the wider trauma team to be aware of. Understanding that it can occur following high-energy trauma, and thus actively considering it when assessing this type of patient, can reduce the risk of the diagnosis being overlooked in the acute setting.

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