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Floating Shoulder with Scapulothoracic Dissociation: A Rare Case

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Abstract

Introduction: Scapulothoracic dissociation (STD) concurrent with a floating shoulder usually occurs in high-velocity trauma. As it is usually associated with a concomitant neurovascular injury therefore, the prognosis is uniformly poor in such cases, with a high incidence of disability. **Case description:** We presented a 47-year-old man who had a motorbike accident which had caused an intracranial haemorrhage and STD with a closed left neck scapula fracture and closed midshaft left clavicle fracture. In this case, the vascular status of the left upper limb was intact. The patient was unconscious, and clinically only an abrasion wound was noticed at the left posterior shoulder, making the clinical examination challenging. With proper chest x-ray evaluation and high suspicion from the high-velocity injury, we could recognize the floating left shoulder with STD. Since the patient was unstable, we immobilized the injured limb with an arm sling before planning for definitive surgery. **Conclusion:** Physicians should think of the diagnosis of STDs in all patients with shoulder girdle injuries. It is critical to recognize this injury early based on mechanism and radiographic parameters in cases where clinical examination is not possible. Initial management should focus on resuscitation and evaluation for potential limb-threatening ischemia.

Keywords

Clavicle fracture, floating shoulder, orthopaedic emergency, polytrauma, scapulothoracic dissociation.

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Introduction

The stability of the scapula comes from the scapulothoracic articulation aided by support from the clavicle strut. Disruption of the clavicle strut and the scapulothoracic articulation leads to scapular instability. STD with vascular and brachial plexus injury is an infrequent but devastating injury. Two factors may account for what seems to be an increased prevalence of these injuries in the modern trauma setting. The first factor is the ever-increasing popularity of motorcycles and recreational activities that place patients at risk for a such devastating injury[1]. The technical improvements in our trauma system will also determine patients' survival rate with such catastrophic injuries.

Despite the apparent increase in STD cases, they still remain as a rare injury. The potentially life-threatening nature of the injury makes proper identification and treatment critical to the orthopaedic surgeons. The STD can be overlooked and missed in the acute setting, especially in the background of polytrauma as the associated injuries can potentially divert the clinician's attention causing delayed in diagnosis and treatment of this potentially devastating injury [2].

Diagnosis of STD is made when the scapula's edge is displaced > 1 cm from the spinous process compared to the contralateral side. CT scan of the chest will show an asymmetric distance from the spinous process to the medial edge of the scapular body. We report a closed left floating shoulder with STDs without vascular injury.

Case report

A 47 years old man had a motorbike accident and was found unconscious at a roadside by a passer-by. He sustained moderate head injury and later was resuscitated and intubated in the emergency department.

On examination, the patient was intubated and sedated. There was swelling over the left clavicle region, and an abrasion wound measured 1cm x 3cm over the posterior shoulder (Figure 1). Left upper limb distal pulses were palpable, capillary refilling time was immediate, and oxygen saturation of all fingers was 99% to 100%. There was a limitation in the clinical examination of the left upper limbs in view patient was unconscious. The patient had undergone decompressive craniectomy on the same day. There was a chest tube inserted into his left chest.

Chest radiograph revealed multiple left rib fractures and left pneumothorax. On the ipsilateral side, there was also a left midshaft clavicle with the neck of scapula fracture and the distance between the spinous process and the left medial border of the scale was widened as compared to the contralateral side, in comparison to the contralateral side, which indicated STD (Figure 2). X-ray of the left humerus and pelvis were normal. The computed tomography of the brain revealed left convexity subdural haemorrhage and contused temporal lobe.

Our initial management for this patient includes application of arm sling and close monitoring of the circulation chart. In repeated chest x-ray, the left clavicle and left neck of scapula fracture were displaced. The distance between the spinous process and the medial border of the left scapula remained the same.

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Figure 1. The clinical picture of the left shoulder in anterior-posterior and superior view. The abrasion wound was seen located on the posterior aspect of the left shoulder.

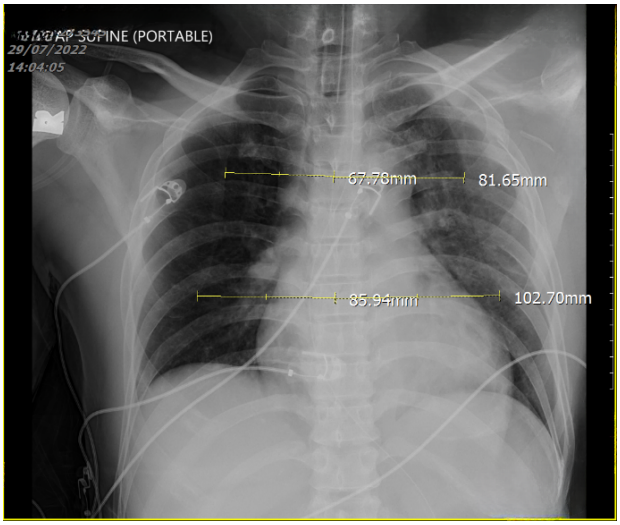

Figure 2. The measurement of the left medial border scapula to the spinous process showed an increase of more than 1cm.

Discussion

Floating shoulder caused by high-energy trauma is highly associated with STD, which commonly under diagnosed as the case is rare, which are probably underdiagnosed and undertreated, as the case is rare.

STD is the traumatic separation of the scapula from the thoracic wall and may lead to vascular and neurological damage to the upper extremity. Scapulothoracic dissociation (STD) is a rare clinical entity with fewer than 70 cases reported in English literature [3]. However the exact prevalence of STD is still not clear and not documented properly in any source. The mechanism of injury is probably the traction caused by a blunt force to the shoulder girdle. It is associated with other lesions and, in most cases, local neurovascular injuries such as plexus or cervical root avulsion and rupture of subclavian or axillary vessels.

It is reported in the literature that half of the STD involved motorcyclist. One case series found that 60% of patients with STDs were It is reported in the literature that half of the STD involved motorcyclist. The most possible mechanism of the injury happened when the motorcyclist attempts to hold onto the handlebars while being forcibly thrown [4]. Most patients with STD also sustained other injuries, commonly head injuries, making the identification of exact injury mechanism challenging. Patients with STD often have a

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poor functional outcome in which 10% of them died from concomitant traumatic injuries, 50% have flail extremity while 20% required amputation of the upper limb [5].

A multidisciplinary approach in managing STDs is necessary due to the complexity of coexistent injuries. Reduction and stabilization of the ipsilateral upper limb fractures, as well as–acromioclavicular and sternoclavicular joint dislocations may be indicated. Emergency surgery or endovascular intervention is required especially in active arterial haemorrhage or limb-threatening ischemia.

Initially, in this case, the patient was suspected to have shoulder injury based on the clinical findings of swelling and an abrasion wound over the left shoulder. Chest radiograph revealed fractures of the left scapular and left clavicle bone and the edge of the left scapula being displaced > 1 cm from the spinous process compared to the contralateral side. Most likely, this patient had high impact injury as a result of lateral traction injury to the shoulder girdle, leading to the occurrence of floating shoulder with STD.

The patient had no vascular injury, as the peripheral vascular status was monitored closely. The peripheral nervous system of the left upper limb was still unable to be appropriately assessed because the patient was still unconscious. The patient was planned for open reduction internal fixation of the clavicle and scapular once he was clinically stable.

Conclusion

It is crucial to have a high suspicion of STD in a patient with an injury of the floating shoulder, especially in a patient with a high-impact injury and unconscious. Besides the proper and thorough physical examination, interpreting the chest x-ray and knowing how to measure the STD is crucial. Early recognition with high suspicion of the injury and a multidisciplinary approach for this complex case by surgical board reviews at various levels within the course of care were critical determinants in the patient's improved prognosis, especially in polytrauma cases.

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