Case Report

Open traumatic scapulothoracic dissociation: Case report of a rare injury

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ABSTRACT

Open traumatic scapulothoracic dissociation is a rare and devastating injury. We are reporting a 21-year-old male factory worker who sustained a traumatic open scapulothoracic dissociation. His left arm was caught in conveyer belts resulting the arm, scapula, clavicle, and pectoral muscle torn from the body by tremendous traction force. He presented with pulseless, flail and cold limb and was promptly resuscitated and surgically managed with forequarter amputation.

Introduction

Traumatic scapulothoracic dissociation (TSD) is a rare upper extremity injury caused by severe traction injury. Disruption of the scapulothoracic articulation secondary to severe traction force trauma without breach of overlying skin gives rise to the term as “closed” forequarter amputation [1]. Clinical manifestations of TSD are pulseless flail arm with massive swelling of the shoulder associated with typical radiographic features of laterally displaced scapular with possibility of sternoclavicular separation, acromioclavicular separation or a distracted clavicular fracture [2]. All previous reported cases reported massive blood loss, and recognition and aggressive treatment of this complex injury are crucial [2,3]. We report a patient with open TSD and describe our experience in the management of this particular injury.

Case report

A 21-year old man was referred to our center following an industrial injury where his left arm was caught in conveyer belt resulting in lateral separation of the scapula and mid shaft clavicle fracture associated with torn pectoral muscle. On arrival, he was anxious, hypotensive, tachycardia, and not in respiratory distress (Grade 3 Hypovolemic shock) with Glasgow Coma Scale of 15. He was resuscitated with crystalloids and blood products. On inspection, there was profound swelling on his upper chest with extensive degloving wound over the anterior aspect of shoulder (Fig. 1a) and cubital fossa (Fig. 1b). Also noted his pectoralis muscle was completely avulsed from its insertion of humerus. His left shoulder was mangled with no sensation below deltoid region as well as flail arm with no motor activity, and no palpable brachial or radial pulse. His Mangled Extremity Severity Score (MESS) score was 10 (crush injury, limb ischemia more than 6 h, cold, paralyzed, insensate limb, hypotensive transiently). Chest radiograph (Fig. 2) revealed laterally displaced scapula and lateral 1/3 left clavicle fracture with intact left sternoclavicular joint.

In view of unfavorable MESS score, as well as open left scapulothoracic dissociation associated with acute limb ischaemia and avulsion of brachial plexus, we proceeded with forequarter amputation rather than revascularization of the traumatic limb. After prompt resuscitation and optimisation, he was sent to operation theater for emergency forequarter amputation (Fig. 3).
Intraoperatively, the left shoulder muscles were crushed with severe contamination. The subclavian artery and vein were severed at the level of the posterior portion of the first rib (3rd part) and noted to be thrombosed. Approximately at the same level of the vessel ends the brachial plexus was found to be macerated. The artery, vein, and plexus trunks were individually ligated. Subscapularis muscle was used as the flap to cover the thoracic wall and minimize the dead space (Fig. 4). Skin flap refashioned and tagged preliminarily. Twenty-four hours later he was returned to the operating room for second look debridement and the huge subscapular and axillary dead space was irrigated and drained. Subsequently, he underwent serial debridement prior to secondary closure 28 days after the onset of trauma (Fig. 5). Recovery was smooth sailing after the operation. The wound was completely healed and he was discharged 35 days after the accident.

Discussion

Open scapulothoracic dissociation is a rare, acutely limb threatening and potentially life threatening injury [5]. Although replantation of a traumatic forequarter amputation has been reported [4], in our opinion this is not worth a try for this patient because of extensive soft tissue damage and avulsion of brachial plexus. When brachial plexus avulsion is identified, no attempt should be made to repair the injuries and consideration should be given for amputation [1].

Moreover, a decision of forequarter amputation was made over shoulder disarticulation because fixation of the scapula in its original anatomic site was impossible and the subclavian vessels were transected proximal to the second part.
The large defects and dead space over the thoracic wall was managed with subscapularis muscle coverage which we subperiosteally dissected from the avulsed scapular bone.

Extensive bleeding into soft tissues of the shoulder and chest in TSD has been attributed to disruption of subclavian vessels [2]. While these vessels are indeed avulsed or severely damaged in TSD, many cases previously reported, as well as our own, actually have had the findings of thrombosis of these vessels.

The key of survival for anyone sustaining this injury is immediate transportation. Altered sensorium, respiratory distress as well as the degree of shock reflect the severity of the injury [3]. Improvement of blood gases, renal function and clinical condition after serial extensive surgical debridement brought about this patient’s favorable outcome. Phantom limb pain which is a possible late complication of forequarter amputation was not seen in this patient.

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**Fig. 2.** Radiograph showing marked lateral left scapula displacement with lateral 1/3rd clavicle fracture.

**Fig. 3.** Amputated limb together with scapula bone (black arrow).
References

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