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Case Report

Floating Shoulder: Fracture of the Clavicle, Surgical Neck and Scapular Body: A Case Report

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Abstract

The fracture of the clavicle and the homolateral scapula is considered a relatively rare injury called a floating shoulder because it is sometimes perceived as an unstable injury. This injury is secondary most of the time to a high energy trauma. treatment options are examined in the light of the current literature. We present a case of mechanical shoulder instability following a domestic accident. Allman type I median clavicle, DeCloux cervix and type I - III scapular fractures were diagnosed following an X-ray examination. There was no evidence of ligament injury. Rupture of the bony skeleton supporting the shoulder is responsible for mechanical instability. The patient was treated surgically with a target plate and 2 fixing screws associated with a shroud for the scapula and a centromedullary kirschner wire for the clavicular fracture. The surgical fixation made it possible to restore the joint, which allows early postoperative rehabilitation and effective physiotherapy exercises in the shoulder.

Keywords: Floating shoulder; Scapula; Clavicle; Glenoid; Mechanical instability

Introduction

A broken collarbone or scapula is considered a stable fracture. However, the homolateral fracture of the collarbone and the neck of the scapula is considered unstable known as "floating shoulder", due to the inability to control the upper limb due to mechanical instability resulting from the injury. The unilateral fracture of the neck of the scapula and the collarbone generally results from a very violent energy; it is relatively rare and there are therefore no randomized trials on the treatment of such a fracture. Most publications are made up of case reports, case series or retrospective observational cohort studies.

Case Report

A 55-year-old man admitted to the emergency room after falling down the stairs at home. After the exploration, the patient complains of excruciating pain associated with functional impotence with slight swelling of the left shoulder joint. Following a radiological assessment by a standard radiography (face / profile) (Figure 1) and a scanner with 3D reconstruction (Figure 2), fractures of the Allman type I median clavicle (Figure 1), partial of the surgical neck and Type I - III scapular body of DeCloux were diagnosed (Figure 1). Then the patient was sent to the orthopedic department for treatment, but no other neu-

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rovascular problems were noted. Likewise, no sign of ligament damage was observed.

The patient was hospitalized with a diagnosis of floating left shoulder. We treated this unusual injury with open reduction and internal fixation of the bone skeleton. The patient underwent general anesthesia and was placed prone on the operating table with the fracture of the scapula exposed. a modified postero-lateral Judet incision (Figure 3). After reduction, the internal fixation of the fractured scapula was carried out using a target plate and 2 screws and guying (Figure 4) used for the rigid fixation of the scapular body and the lateral column. The patient was then moved to the supine position and the collarbone was exposed (Figure 5). A 4 cm transverse incision was made in front of the clavicle fracture. A 25 mm kirschner wire was used to reduce and stabilize the fracture of the clavicle under scopic guidance. A standard postoperative control X-ray on D + 2 was performed (Figure 6).

The patient is discharged after three days postoperative monitoring. After two weeks, pendulum exercises were prescribed. By week six, the arm sling was removed and the patient was able to use his arm freely. No postoperative complications were noted. The patient resumed daily activities after two and a half months. At the 8th - 9th week postoperative, the patient's score on the DASH questionnaire (Disabilities of the Arm, Shoulder and Hand) was 23 and the WOSI (Western Ontario Shoulder Instability Index) score was 110/2100 = 5.2%; the active flexion was 110° and the abduction was 80° -90°.

Discussion

The term "floating shoulder" was first used by Ganz and Noseberger in 1975 [1]. In 1993, Goss described the concept of an upper shoulder suspensor complex to elucidate the pathoanatomy of shoulder injuries [2]. The upper shoulder suspensor complex consists of a bone ring and soft tissue (glenoid, coracoid process, coracoclavicular ligament, distal clavicle, acromioclavicular joint and acromion process). Recent biomechanical studies show that a disruption of the coracoacromial and acromioclavicular capsular ligaments is necessary for a diagnosis of floating shoulder [3]. However, it is believed that double disturbances of the upper shoulder suspensory complex are unstable. One of these double disturbances is the homolateral fracture of the collarbone and the neck of the scapula of the so-called floating shoulder [4].

In general, Homolateral fractures of the neck of the scapula and the clavicular stem do not justify a floating shoulder injury, unless a ligament injury is also present [5]. Goss did not mention the coracoacromial ligament in his description of the upper shoulder suspensory complex, but it is the only direct ligament connection between the proximal fragment and the distal fragment [2]. It should therefore be included in the upper suspensory complex of the shoulder. It seems that the term "floating shoulder" itself is not fully understood. Many previous articles have described any injury with a homolateral fracture of the scapula and collarbone as a floating shoulder injury due to perceived mechanical instability.

In the case of scapular fractures, the trauma that is involved is almost always direct high energy to the shoulder. In our case, the cause was a fall from the stairs from a fairly significant height, although the most frequent cause is accidents on the public highway according to the literature [6].

Direct anteroposterior and Y scapular radiographs are useful for the diagnosis of a floating shoulder. In case of suspicion without radiographic confirmation, Computer assisted Tomography (CT) can be useful. In our case the standard radiography associated with a bone scanner of the shoulder with 3D reconstruction confirmed the diagnosis [7].

From a general point of view, direct trauma involving high energy has been the cause of fractures of the scapula can give local and locoregional lesions in particular of the thorax. In these cases, careful examination is necessary to detect associated or more extensive lesions [6,7]. In our case, the patient has no associated locoregional or general lesions.

The literature on the treatment of floating shoulder is relatively weak, in the sense that all the articles mention retrospective studies without adequate control. The criteria for defining the lesion as a floating shoulder are not identical in all the articles. There is no uniformity in outcome measures to assess the outcome of individual treatment and the number of patients examined in these studies is also not significant. This does not help to draw a scientific conclusion as to the best treatment for this injury [8,-12]. Whether or not to treat patients with fractures in the shoulder area remains controversial. Even if in the majority of cases, the early functional treatment of these cases gives good or excellent results. The current literature shows good to excellent results for these two treatment methods [13,14].

Before 1970, almost all lesions of the floating shoulder were treated conservatively [8]. This trend changed after Ganz and Noesberger found that scapular fractures associated with a homolateral clavicular fracture were displaced more often and more severely than scapular fractures that were not associated with a homolateral clavicular fracture [1]. Since then, treatment recommendations for all homolateral fractures of the clavicle and scapula, although minimally displaced, have focused on some form of internal fixation to reduce the risk of displacement of the fracture scapular. However, recent studies [8,10,15] have suggested an effective conservative treatment for homolateral fractures of the collarbone and minimally displaced fractures of the shoulder blade. Edwards et al. have reported excellent results with conservative treatment for 20 consecutive patients, five of whom had glenoid fractures that had been displaced by more than 5 mm [8,13]. In contrast, Ada et al. reviewed 113 cases and reported poor functional outcomes for non-surgical surgical scapular neck fractures [18]. Some surgeons recommend surgery in all circumstances [16]. Others suggest that a direct trauma with high violence, the origin of an unstable shoulder, and that it is therefore often associated with injuries of the chest which is one more reason for surgical stabilization, because these patients need intensive respiratory therapy.The goal of surgery is to restore the joint, which allows for early mobilization and effective shoulder physiotherapy exercises. Treatment methods may vary for each patient. As well as the recommended operating techniques have varied and have included 3 types: first type, the isolated fixation of the clavicle to prevent late deformation and the researchers suggest that this is sufficient to maintain the stability of the shoulder girdle and prevent scapular malunion [16]. Practitioners of only clavicular fixation suggest that it is a relatively simple operation compared to the ORIF (Open Reduction Internal Fixation) of the scapula and that by fixing the clavicle, the fracture of the scapular neck is indirectly reduced [11]. Hashiguchi and Ito [14] reported excellent results with surgical fixation of the clavicle only, while Van Noort et al. [10] say exactly the opposite. The second type, Isolated

fixation of the scapula neck, like Hardegger et al concluded that the stability of a fracture of the scapula neck depends on the integrity of the clavicle and the coracoclavicular ligament [17]. They recommended stabilizing the neck of the scapula with a semi-tubular support plate applied to the posterior part and a compression screw that allows the spine of the scapula to enter the neck of the scapula. And finally the combined fixation of the collarbone and the neck of the scapula. Some authors have suggested that the dysfunction of the cuff is the result of the loss of the normal lever arm of the rotator cuff and recommended the ORIF (Open Reduction Internal Fixation) for displaced fractures of the cervix and spine to prevent these problems. However, rotator cuff symptoms could be directly related to the cuff injury associated with a shoulder injury rather than an abnormal glenohumeral joint and subacromial space. The normal lever arm of the rotator cuff is lost when the glenoid is moved, resulting in weak abduction and pain in the subacromial region [17]. Ada and Miller reported a high incidence of rotator cuff dysfunction and cuff injuries in patients with displaced scapula and spine fractures treated non-surgically [18]. In case of non-operative treatment. The most frequent complications, although the prevalence of these complications has not been defined, namely the reduction in the range of motion, The reduction in the force of abduction and malunion [19].

The conduct to be used in the management of the floating shoulder is controversial according to the current literature, it is linked to the experience of the surgeon and the expectations of the patient. The treatment options are always open to possible modifications. Surgical and conservative treatment can give good results [14,16]. Prospective and multicenter studies can add clinically important information to allow practitioners to choose the optimal treatment for these injuries.

Conclusions

It seems that most of the homolateral fractures of the clavicle and scapula, of the floating shoulders, do not cause bone healing problems (delayed union, non union or bad union). Although the retrospective clinical studies reported do not allow clear recommendations to be made.

Despite the anatomical reduction of the clavicular fracture and the integrity of the coraco-acromial and coraco-clavicular ligaments, the displacement of the fracture of the neck of the scapula will persist. This is not caused, as the literature suggests, by the medial displacement of the glenoid fragment, but explicitly by the lateral displacement of the mobile scapular body.

The presumption that a significant shortening of the neck of the shoulder blade will cause the rotator cuff to malfunction by shortening its lever arm is logical, but has not been confirmed by clinical studies to date. it is not yet clear on what criteria a floating shoulder should be treated surgically, based on clinical and biomechanical studies.

In the end, one must be wary of surgical over treatment when there is no solid data to support an aggressive approach.

Consent

The patient's written informed consent was obtained for the publication of this case report and the accompanying images. A copy of the written consent is available for review by the editor of this review.

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