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Case Report

Tension band wiring in a rare case of isolated acromion fracture: a case report

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ABSTRACT

Fracture of the acromion process is an uncommon injury. The most common mechanism of injury is direct trauma to the acromion. Isolated acromion fractures are rare as usually they are associated with concomitant skeletal and soft tissue injuries of the shoulder. We present a case of a 45-year-old male with a type 3 fracture of acromion process with reduction of subacromial space. Patient was managed surgically and fracture was fixed using tension band wiring. Patient was followed up using UCLA, DASH and VAS scores and showed good radiological and functional outcomes. Minimally displaced fractures should be regularly followed up for displacement and sub-acromial space compromise. Although acromion fractures are usually treated conservatively, albeit a higher non-union rate, they should be treated surgically in the event of displacement or sub-acromial space reduction, in order to achieve good functional recovery.

Keywords: TBW, Acromion, Fracture

INTRODUCTION

Acromion is the lateral projection of the spine of scapula. Fractures of the acromion process are encountered infrequently with an incidence of 8% of all scapular fractures.[1] The most common mechanism of injury is a direct fall on the acromion but it can also result from a direct downward blow to the shoulder. Most of these fractures have been associated with concomitant skeletal and soft tissue injuries of the shoulder.[2,3] A displaced fracture of the acromion, can impair the normal function of the shoulder joint and compromise the subacromial space leading to impingement syndrome.[4-7] Diagnosis can be difficult and requires a careful clinical examination and special imaging. Computerized tomography (CT) is particularly useful in providing a more accurate assessment of the fracture type, the number of fragments, and the presence of subacromial impingement. We present a case of type 3 acromion fracture (Figure 1) treated surgically with tension band wiring.

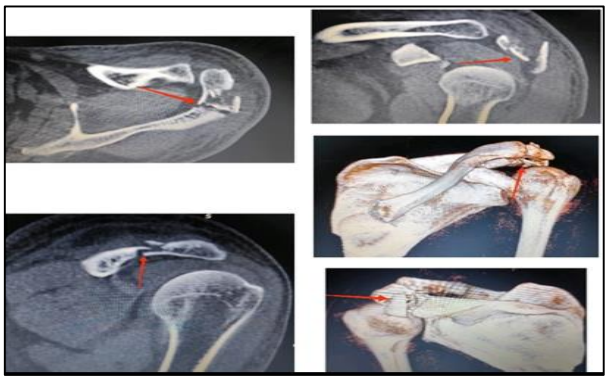

Figure 1: Pre operative CT images of Kuhn type 3 acromion fracture (Red arrow).

CASE REPORT

A 45-year-old male labourer with a history of road traffic accident presented with c/o pain in left shoulder and right arm. Physical examination revealed a hematoma, pain and

tenderness over the left acromion process and crepitus and swelling of right arm with no evidence of vascular and neurological injury. The initial assessment and resuscitation of the patient was done according to advanced trauma life support protocols. Following resuscitation Anteroposterior and lateral radiographic views of the left shoulder and right arm were done which revealed a Kuhn type 3 acromion fracture with reduction of the subacromial space and a midshaft humerus fracture in right arm. Computed tomography with 3D reconstruction was cone which provided a more accurate assessment of the displacement and eliminated associated injury. It demonstrated an isolated left acromial fracture with reduction of the subacromial space without any lesion of acromioclavicular joint, coracoid or clavicular fracture. Patient was managed surgically under general anaesthesia in right lateral position. Acromion fracture was exposed using Superolateral approach (Figure 2). Open reduction of the fracture was done and it was fixed using tension band wiring (K wire 2 mm diameter). Humerus fracture was also managed in the same sitting using humerus interlock nail. Post-operative period was uneventful. Post-operative radiographs were satisfactory (Figure 3). Elbow and wrist movement were started on post-operative day 1. Shoulder was immobilized for 1 week using elastic shoulder immobilizer. Pendular exercises and passive range of movement were started in 2nd week as tolerated by the patient. Active assisted exercises were started at 4 weeks using a rope and pulley assembly. The patient was allowed active range of movement of shoulder joint 6 weeks post operatively. Clinical and radiological assessment was performed at the 6-week, 6-month, 18-month follow-up visits using radiographs (Figure 4). Visual analogue score, range of motion, UCLA. Hardware removal was planned at 12 months after radiology demonstrated consolidation at fracture site but patient denied any surgical intervention as there were no complaints. Patient had no pain after 6 months. UCLA score was 30 at 6 months and 35 at 12 months of follow up. DASH score 13.3 at 6 months, 5 at 12 months and 3.3 at 18 months of follow up. Patient had no limitation in range of abduction, external rotation, internal rotation and forward elevation at 12 months.

Figure 2: Intra operative image showing TBW of acromion process.

Figure 3: Immediate post op X-ray showing adequate reduction of acromion fracture after TBW.

Figure 4 (A-C): Axillary, scapular Y view and antero posterior view of left shoulder respectively at 18 months follow up.

DISCUSSION

Isolated fracture of the acromion is a rare lesion, representing less than 8% of all fractures of the scapula.[1] The acromion commonly absorbs direct blow, and acromioclavicular joint separation is much more common than is a fracture of the acromion. With respect to the isolated acromion fracture, there are very few case reports in the literature. Most of these fractures have been associated with concomitant skeletal and soft tissue injuries of the shoulder like coracoid fracture, clavicle fracture, or acromioclavicular disjunction.[2,3] In our case patient had type 3 acromion fracture on left side with a midshaft humerus fracture of opposite limb. Patients with acromion fracture should always be evaluated for brachial plexus injury. Kuhn et al defined five distinct types of acromion fractures that were classified into three groups. Stress fractures, type I with minimal displacement and type IA avulsion fractures, which heal rapidly. Type IB

fractures result from direct trauma, with minimal displacement. Type II displaced fractures that do not reduce the sub acromial space, and a type III with inferior displacement and with sub acromial space involvement.[8] Although acromion fractures are usually treated conservatively, though a higher non-union rate, they should be treated surgically in the event of displacement or sub-acromial space reduction, in order to achieve good functional recovery. The presence of associated fractures of the scapula is also an indication for operative treatment. CT Scan with 3D reconstruction is very helpful in the diagnosis, assessing the fracture configuration and planning of treatment of acromion process fractures and should form an integral part of the diagnostic work-up.[9] Surgical management can be done by various modalities like tension band, cannulated screws, or plates depending on surgeon's preference.[8,10] The primary objectives of open reduction and internal fixation (ORIF) are anatomical repositioning of the lateral fragment to restore the physiological width of the sub-acromial space, to establish a rigid fixation to neutralize the deltoid muscle forces, and to provide sufficient compression on the fracture for proper bone healing. Our patient was a high demanding young active male so we treated him surgically using tension band wiring technique. It is a less invasive technique and can achieve good compression at the fracture site. Goss also suggested good results with TBW technique.[11] Plate osteosynthesis provides a superior biomechanical stability but is associate to a higher rate of infection.[12,13] Hess et al also concluded in their study that patient characteristics, such as activity level, might be a relevant parameter when selecting a treatment strategy. Early fixation may be the most sensible way to treat working adults who need to avoid long absences from work.[14] Our patient was able to do all his routine activities and returned to his pre injury heavy labour work at 12 months with no complaint of any pain and a good range of movement and an excellent UCLA and DASH scores (Figure 5). We did not observe any complications related to either the operative procedure or the implants used.

Figure 5: Good range of motion at 18 months follow up.

CONCLUSION

Isolated acromion process fracture is a rare injury. Tension Band Wiring offers good results in such rare injuries. It is a less invasive technique that achieves good compression at the fracture site, has lower incidence of hardware loosening and lower rates of revision surgeries.

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