

Case Report

A case report-management of concomitant acromion fracture with acromioclavicular joint dislocation

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ABSTRACT

Shoulder injuries which comprises of simultaneous acromion fracture and acromioclavicular dislocations are rare injuries which were usually managed conservatively or sub optimally in previous times. These managements provided functional results with variable satisfaction. But in this era of grand armamentarium of fixation options we are trying a management option for these type of injuries. Here we present the case of 52 year old gentleman who met with a road traffic injury presented with right dominant side injury with pain and inability to move the shoulder. X-ray and CT evaluation done which yielded concomitant acromion fracture and acromioclavicular joint ligamentous dislocation. He was managed by fixation of acromion fracture by 4 holed 3.5 locking reconstruction plate and tightrope endo-button fixation of the acromioclavicular joint. As the said injury is a rare injury, literature references aided in decision making. Systematic approach to the injury along with a planned rehabilitation protocol yielded patient near normal pre injury level status of dominant side shoulder function. More literature must be published with variants of these fractures and varying fixation methods to attain a meta-analysis level for conclusive evidence.

Keywords: Acromion fracture, Acromioclavicular joint dislocations, Endo-button fixation, Reconstruction plate, Tightrope

INTRODUCTION

Shoulder trauma is one of the most common traumatic injury-consists nearly of 21% of road traffic accidents and domestic falls. Shoulder girdle comprises of glenohumeral joint, acromioclavicular joint, sternoclavicular joint, scapulothoracic joint. Shoulder joint injury and its prognosis directly related to the functional need of the injured. Unlike any other injuries, shoulder injuries may go unnoticed and treated sub optimally ending with patient accepting the calculated limitations of the joint.¹ Out of this, acromion fracture seems to be a rare injury which is mostly detected late and managed conservatively due to non-design of anatomical implants in most of the areas of acromion. Acromion directly act as a fulcrum in which shoulder elevation happens. The management of acromion fracture along with an acromioclavicular joint injury is

multifaceted which may need tailored approach to each patient. If isolated injury, acromion fractures are managed conservatively with sling immobilization, rest and physical therapy while displaced unstable fractures may need surgical intervention. Acromioclavicular joint injury treatments depend on grade of injury and treatment span from lesser grade injuries requiring conservative management and higher-grade injuries needing surgical intervention. The treatment regimen if both of these injuries occur together is a topic for discussion as no notable comprehensive data available.

In this case report, we present a case of concomitant acromion and acromioclavicular joint injury and its management. To understand the injury, need to know the anatomy of the shoulder joint, acromion, acromioclavicular joint and clavicle. Acromion is the

lateral projection of scapular spine that extends anteriorly. A well-defined treatment algorithm for acromion fracture is not described. The management of isolated acromion fracture vary depends on fracture site and person to person functional requirements.

Classification

Three types of acromial fracture are defined which can help to determine whether surgical or non-surgical treatment is appropriate.

Type I

Non- or minimally displaced. IA: avulsion fractures, IB: true fractures

Type II

Displaced but does not reduce the subacromial space.

Type III

Displaced with narrowing of the subacromial space due to inferior displacement of the acromion or superior displacement of an associated glenoid neck fracture.

Usually, type 1 and type 2 fractures undergo conservative line of management. Type 3 fracture as surgically fixed in view of possibility of subacromial impingement. The modes of fixation of acromial fractures are by k wires, reconstruction plates, tension band wiring.

Here in this case report we would like to discuss a case of unusual presentation of concomitant ligamentous acromioclavicular joint dislocation and acromion fracture

CASE REPORT

52 years old male presented with alleged history of road traffic injury sustained injury to the right shoulder. He fell down at a speed of 40 km/hour directly impacting posterior shoulder. He was presented to the emergency room with complaints of wound over the right posterior shoulder, pain and painfully restricted movement of right shoulder. He has no significant evidence of head, chest or abdomen injury, no other systems were involved. He has no known comorbidities or previous surgeries. Local examination revealed a lacerated wound of 7×2 cm over the posterior part of shoulder with crushed skin edges and no active bleed. Profound deformity seen at acromioclavicular joint. Distal neurovascular examination revealed no deficits. Wound wash and dressing of the wound done in emergency room and sent for radiological evaluation.

X-rays revealed pure ligamentous acromioclavicular joint dislocation- Rockwood classification type 5-subcutaneous distal clavicle with coracoclavicular distance more than 100% difference to contralateral side. Anteroposterior X-rays showed a fracture line in the acromion hence a

computed tomography of the part is taken to visualize the three-dimensional view of the fracture acromion. The acromion fracture found to be type 3 fracture technically which reduces the subacromial space radiologically. The patient is planned for fixation of acromioclavicular joint dislocation reduction and acromion fixation on the very next day.

Choice of implants

Acromioclavicular joint dislocation reduction and fixation using knotless acromioclavicular repair tightrope system. K wire fixation of clavicle with acromion after acromion stabilization if acromioclavicular joint reduction has anteroposterior instability. 3. Acromion fracture planned for internal fixation using 3.5 reconstruction locking plate with at least 2 screws in both fragments 4. Tension band wiring of acromion fracture if plate not holding reduction.

On the surgical table, patient was positioned in semi sitting beach chair position with affected shoulder exposed towards its side. A towel bump is placed in the interscapular area. Intra operative evaluation revealed lacerated wound with crushed edges as said-wound debridement done and extended proximally for visualisation. Posterior fibres of deltoid found to be disrupted nearly 50 percent fibres. Acromion fracture reduced and reduction held using a pointed reduction clamp. Anatomical reduction is visualized and fixed with 4 holed 3.5 locking reconstruction plate adjusted to achieve 2 screws in each fragment. C arm images taken to confirm screws inside bone not disturbing subacromial space. Humerus range of movement shows no restriction intra op.



Figure 1: Immediate X-ray post trauma showing acromion fracture which reduces the space and acromioclavicular joint dislocation.



Figure 2: Contralateral shoulder X-rays are obtained to compare the status of acromioclavicular joint injury.



Figure 3: 3D CT image of the acromion fracture showed type 3 fracture with displacement.



Figure 4: Intra op C-arm image with acromion fracture fixed with reconstruction plate and acromioclavicular joint reduced using tightrope button system.



Figure 5: Postoperative X-ray.

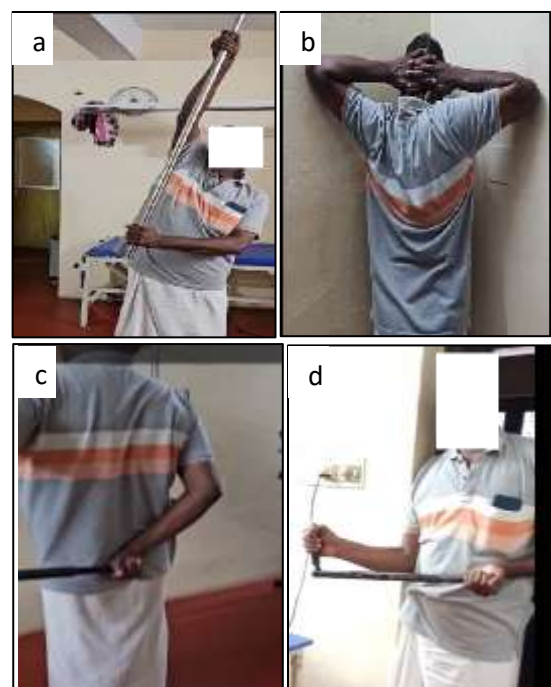


Figure 6: 3 months postoperative physiotherapy rehabilitation.



Figure 7: 3 months postoperative X-ray.

Acromion joint reduction done with pressure applied over clavicle and fixed with 2 k wires in acromioclavicular direction. Reduction confirmed with c arm and visualized acromioclavicular joint through the acromion incision. Mark the coracoid process and place a k wire in line with coracoid process and mark the point on clavicle make a 2 cm incision on the marked portion of the clavicle such that it is in line with coracoid process. Make a drill hole in the centre of clavicle after palpating anterior and posterior border of the clavicle. Palpate for coracoid process using a k wire through the hole and drill the coracoid in line with the clavicular drill hole.

Insert the titanium button to coracoid and flip it - confirm with c arm. Then the low-profile button is tightened on clavicle using knotless system, hence the acromioclavicular joint is reduced using tightrope supported by 2 buttons on clavicle and coracoid. The provisional k wires are removed. Antero posteriorly stable acromioclavicular joint. C arm images show anatomical reduction. Posterior deltoid fibres approximated, wound closed in layers. Shoulder immobilizer applied. Postoperatively he was restrained from shoulder range of motion. Suture removal done after 2 weeks.

DISCUSSION

This report presents the reader with an acceptable way to address a rarer injury of acromioclavicular joint dislocation and acromion fracture occurring together. Similar kind of fixation done with these implants were discussed only in one of the studies which helped us to proceed.¹ It is important to look for acromion fractures in shoulder injuries as it is not uncommon to go unnoticed.

In this case, open fracture of the acromion provides the surgeon with extension of the lacerated wound helps in reaching acromion fracture. In cases of closed similar fractures superior extension of the deltoid split approach to reach the acromion fracture completely. One concern along with the acromion fracture is to decision of need of fixation. Literature suggests type 1 and type 2 fracture of acromion to undergo conservative management but type 2 fracture which is displaced but not reducing subacromial space may leave a probable chance of non-union and later displacement to subacromial impingement. Thus, author prefers to fix type 2 acromion fractures along with ac joint dislocation to prevent further non-union and impingement.⁵

Acromioclavicular dislocation evaluation needs contralateral acromioclavicular radiograph for better grading and treatment. The next treatment decision dilemma occurs when a type 2 or type 3 acromion fracture occurs with different Rockwood grades of acromioclavicular joint dislocation. In those cases, the author prefers to fix the acromion fracture and fix the acromioclavicular joint in similar manner but if anteroposterior instability persists then 2 acromioclavicular joint k wires are used for stabilization.

These k wires will be removed after 3 months. Previous evidence based studies suggest various reconstruction techniques of coracoclavicular ligament but fixation of acromioclavicular joint dislocation with endo-button and tightrope fixation provides good stability and healing of the coracoclavicular ligament.³ Surgeons who prefers to use a clavicle hook plate for acromioclavicular joint dislocations but in cases with concomitant acromion fracture using the hook plate may cause undue force on the acromion fracture which may lead to fracture displacement even though the acromion fracture is fixed.⁶ Intraoperatively we tried to use a hook plate after acromion fixation but found to produce stress on the posterior part of acromion. Choice of implant in fixation of acromion fracture and acromioclavicular joint injuries may cause confusion in decision making so it is advisable to start the case with backup implants if chosen option does not provide satisfactory stabilization.

No definite protocol for postoperative rehabilitation is explained. He was started on shoulder pendulum exercises after 3 weeks of surgery. At 6 weeks he was allowed to do abduction and forward flexion up to 90 degrees which was passive. At 2 months postoperative he was started on cross body adduction, abduction forward flexion rotation actively as tolerated. At 3 months he regained near normal functionality of the shoulder girdle.

CONCLUSION

Concomitant injury of acromion fracture and acromioclavicular dislocations addressed judiciously in the discussed manner shall provide a better clinico radiological outcome than conservative management. It is always advisable to prepare the types of implants and instrumentation needed for the fixation as multidirectional instability of acromioclavicular joint is identified on table.

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