



Case Report

# Surgical reconstruction of acromio clavicular joint dislocation using double endobutton

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## Abstract

Acromioclavicular joint (ACJ) dislocation accounts for around 3–10% of all the injuries occurring around the shoulder girdle. Here we have discussed surgical management for a patient to treat type-3 ACJ dislocation. This is a case of type-3 ACJ dislocation sustained as a result of road traffic accident. Here the case was managed surgically with a double endobutton loop technique and was followed with physiotherapy from first post-operative day. Patient regained pain free full range of movement. Treating type-3 ACJ dislocation has always been surrounded with controversy. With surgical management and early physiotherapy, we can give patient a pain free and full range of shoulder movement. Surgical treatment for a patient with type -3 ACJ dislocation would be an ideal choice, as it gives patient an opportunity for an early and better rehabilitation and early return to work.

**Keywords:** Acromio clavicular joint (ACJ) dislocation, surgical treatment, double endobutton loop technique.

## 1. Background

ACJ dislocation accounts for 3–10 % of injuries occurring around the shoulder girdle [1]. The occurrence of this injury is more common in young individuals since its association with sports injury or high energy road traffic injury. After a traumatic event diagnosis is made clinically by pain and tenderness over ACJ and abnormal movement of distal end of clavicle in vertical as well as in horizontal plane. A stress x-ray is taken to confirm the diagnosis.

The Rockwood classification [2] is most commonly used to describe the degree of the injury to the AC joint. Rockwood had modified the initial classification which was done by Tossy et al [3], who had classified ACJ into three types of which 1 and 2 being mild and 3 being severe. Rockwood further classified it and added type 4-6 to Tossy's classification. Rockwood type 1 and 2 is treated non surgically. Rockwood type 3 has always been a subject of controversy with regards to surgical or non-surgical treatment, and it may be approached using the criteria put forward by Copeland [4].

The treatment modality has always been surrounded by controversies, from few believe in non-surgical and few claiming surgical to be more rewarding. There is no widely accepted standard surgical method for treating type-3 ACJ dislocation. The different surgical methods which have been advocated for treating ACJ dislocation include - coracoclavicular ligament transfer, fixation with a hook plate, fixation with wire, fixation with a screw (Bosworth), coracoclavicular suture loop technique using endobutton [5].

There are two surgical techniques which are popularly been done and they are hook plate fixation and coracoclavicular ligament fixation using suspension loop device [6]. The main disadvantage of hook plate fixation is it needs a second surgery to remove the implant [7], as it may cause upward cutting of hook through the acromion [8], subacromion

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osteolysis [9], fracture, and rotator cuff tear [10]. In this case study we have done a coracoclavicular ligament reconstruction using a device called endobutton, this device has been used successfully in reconstruction of ACL, we have modified the technique by using a second endobutton to the construct [11].

## 2. Rockwood classification

Type I: sprain of the acromio clavicular (AC) ligaments – X-ray shows no alterations.

Type II: rupture of the acromioclavicular ligaments and sprain of the coracoclavicular ligaments distal end of clavicle is unstable in horizontal plane, and stable in vertical plane preserved by virtue of intact coraco clavicular ligament - X-ray shows <25% increase in acromioclavicular space.

Type III: rupture of the acromioclavicular and coracoclavicular ligaments resulting in complete acromio clavicular dislocation- X-ray shows 25-100% increase in acromioclavicular space.

Type IV: rupture of ligaments with posterior dislocation of clavicle through the trapezius muscle, some call it posterior dislocation of clavicle and few call it anterior dislocation of AC joint.

Type V: rupture of the acromioclavicular and coracoclavicular ligaments, combined with stripping of trapezius and deltoid muscles in the distal half of the clavicle - X-ray shows a 100–300% increase in acromioclavicular space.

Type VI: rupture of acromioclavicular ligaments with inferior dislocation of the clavicle, clavicle might occupy subacromial position in which coracoclavicular ligament is intact or might occupy sub coracoid position in which the coracoclavicular ligament is ruptured- X-ray shows inferior dislocation of the clavicle.

## 3. Case presentation

A 30-year-old male patient was brought to emergency room with an alleged history of road traffic accident. Patient was conscious with GCS-15, with main complaints of pain over the left shoulder and inability to lift the left upper limb. Patient was advised plain and stress X-ray, and X-ray confirmed left type-3 acromioclavicular joint (ACJ) dislocation with widened Coracoclavicular space (Fig. 1). After required pre-anaesthetic blood investigations and fitness patient was taken up for surgery. Patient was taken up for surgery on the third day of the injury. Physiotherapy was started from first postoperative day onwards. One month after the surgery patient was without pain and with a full range of movement at the glenohumeral joint.



**Fig. 1.** X-ray shows dislocation with widened Coracoclavicular space.

### 3.1. Surgical procedure

Around 5 cm vertical incision is made from the palpable part of coracoid process to the anterior margins of distal clavicle. Deltoid fibre are split in line with its fibres and tip of the coracoid is identified and cleared off till the base of the coracoid process. Anterior and superior surface of the clavicle is cleared. Guide wire is passed around 3 cm from the ACJ from the clavicle to the base of coracoid process under c-arm guidance (Fig. 2). After confirming the position, 4.5 mm drill is passed over the guide wire (Fig. 3). The device is constructed by taking endobutton and fibre wire. The fibre wire is first passed through the 2 and 3 hole and pulled to equal length, then both ends of the fibre is passed through the 1st and 4th hole, finally both ends of fibre is passed again through the 2nd and 3rd hole and pulled to equal length (Fig. 4). Same procedure is done with the second endobutton, and this creates a single knotless loop (Fig. 5). Now the first endobutton is passed through the clavicle drill hole and next from coracoid process drill hole (Fig. 6). The fibre is gently pulled so that the first endobutton falls horizontal below the coracoid process and holds it firmly (Fig. 7). The ACJ is reduced and the second endobutton is placed horizontally over the clavicle and the fibre is pulled tightly and knot done, holding the reduction (Figs. 8 and 9).



Fig. 2



Fig. 3



Fig. 4

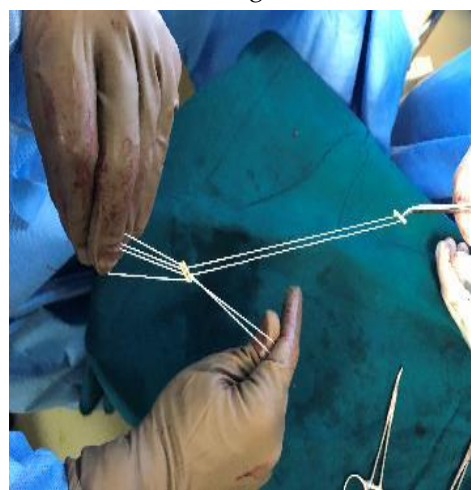


Fig. 5

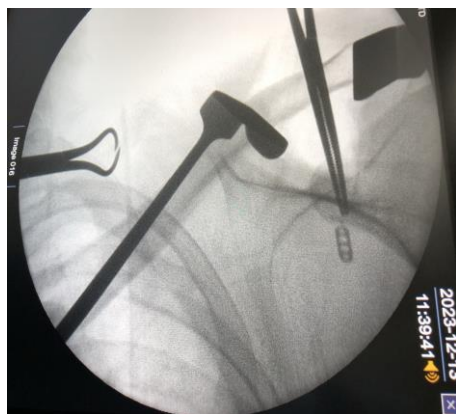


Fig. 6



Fig. 7



Fig. 8



Fig. 9

#### 4. Discussion

Acromioclavicular joint (ACJ) is an arthrodial joint located between the lateral end of clavicle and medial margin of acromion process of scapula. During the movement joint gets stability by static and dynamic stabilizers. The static stabilizers primarily being the joint capsule, acromioclavicular ligament and coracoclavicular ligament [12]. The dynamic stabilizers being deltoid and trapezius. Acromioclavicular ligament gives antero-posterior stability and coracoclavicular ligament gives vertical stability [13].

The mechanism of injury is fall on the shoulder with the upper limb in adduction and the force driving the acromion down and medially. The acromioclavicular ligament being the first to sprain or tear followed by the coracoclavicular ligament. Understanding this mechanism of injury is important in planning the surgical procedure to reconstruct the torn ligament complex.

The treatment of an acute ACJ dislocation has always been surrounded by controversies. With no golden procedure being accepted, the dilemma still persists between surgical and nonsurgical management. In this case report we have treated this patient diagnosed to have type -3 ACJ dislocation surgically by reconstructing the conoid part of the coracoclavicular ligament using endobutton. This endobutton technique has been used successfully in reconstructing anterior cruciate ligament (ACL), here we have adopted this technique with a modification by using second endobutton [11]. This device gives a stable fixation of ACJ, which helps in early mobilisation of the limb. Patient is advised gentle active passive shoulder mobilization from first post-operative day. Patient achieved around 140 degrees of flexion and abduction within four weeks (Fig. 10).



Fig. 10.

### Conclusion

The technique has given a very satisfactory and good functional result with patient satisfaction.

### Consent

Consent was taken from the patient for publication of the case report, details and related images.

Since it is a case report it is exempted from ethical committee approval

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