

## Case Report: Arthroscopic Fixation of Type V Acromioclavicular Joint Dislocation

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### ABSTRACT

Acromioclavicular Joint (ACJ) dislocation is a common injury. It is common among athletes involved in contact sports and victims of motor vehicle accidents. High-grade (ACJ) dislocation (Type IV-VI) is managed surgically through different procedures. These range from a simple plate and screw fixation to more complex procedures involving ligament repair, transfer and reconstruction. The rationale for an arthroscopic approach to treat a dislocated AC joint is to minimize the soft tissue injury through preserving as much blood supply as possible to support post-operative healing. Also, to decrease the risk of surgical site infections and better postoperative outcomes. On the other hand, the arthroscopic technique needs an experienced surgeon. In this case, report our aim to encourage fixing (ACJ) with this technique.

### INTRODUCTION

One of the oldest traumatic pathologies recorded in the literature is acromioclavicular (ACJ) dislocation<sup>(1)</sup>. With an incidence 1.8 per 10,000 per year<sup>(2, 3)</sup>, with a significant increase in military populations of up to 92 per 10,000 person-years<sup>(3)</sup> and contact sports, as one study showed 40% of 226 collegiate football players with shoulder injuries had AC dislocation<sup>(4)</sup>. In a recent study, AC dislocation reports for about 12% of all shoulder injuries, almost half of which (43.5%) are associated with sports in young people<sup>(5)</sup>. Moreover, AC dislocation is 10 times more common in males from 20 to 39 years of age and predominant in young people since it is associated with high-impact sports and high-speed vehicle accidents<sup>(1)</sup>. Coracoclavicular ligaments are the link between the clavicle and the coracoid in the moment of abduction. In AC dislocation these ligaments are ripped. Under the effect of gravity, the arm gets pulled downwards, while the clavicle is lifted upwards under the action of trapezius muscle<sup>(6)</sup> giving rise to a step-off deformity. Clinically, there is a sharp pain in the upper portion of the shoulder, limitation, swelling, bruising, deformity, and piano key sign<sup>(1)</sup>. AC dislocations are classified in six types after Rockwood based on morphology on plain radiographs recently updated with magnetic resonance imaging (MRI)<sup>(2, 6)</sup>. As a rule of the thumb, Rockwood type I and II are generally treated conservatively, Rockwood types IV, V, and VI are treated surgically and Rockwood type III is quite controversial as some surgeons prefer conservative treatment, while other option for surgical treatment<sup>(4, 6)</sup>. There are 60 surgical techniques to treat AC dislocation, with more than 150 variations<sup>(3, 7)</sup>. However, none of them has been recognized as a gold

standard, from a clinical and radiological point of view<sup>(7, 8)</sup>. On the other hand, it has been reported that most open surgeries are associated with complications such as infection, correction loss or implant migration<sup>(2)</sup>.

### CASE REPORT

A 44-year-old man presented to the Emergency Room complaining of severe right shoulder pain for the past four days. He mentioned that the pain started after he fell directly on it. He stated that the pain increased with shoulder movement and noticed deformity in the right shoulder.

On examination, there was obvious deformity on inspection, tenderness over the acromioclavicular joint on palpation, and a limited range of motion. The neurovascular bundle was intact. Shoulder X-ray (**Figure 1**) was done which revealed markedly dislocated right acromioclavicular joint with the clavicle pointing upwards from its lateral end. For more accurate assessment for management, we ordered a shoulder CT.

CT showed a high-grade acromioclavicular dislocation with noticeable incongruence of the articular sides, the superior clavicular displacement was approximately 100% of clavicular width relative to the acromion. Indicating rupture of the main acromioclavicular ligaments. Meaning that, this patient had a Rockwood type V acromioclavicular dislocation. As per the clinical findings, our patient was undergoing surgical intervention arthroscopic AC joint reconstruction with dog-bone. The patient was positioned in a beach chair attitude. First, a posterior portal for viewing and an anterolateral portal for

instrumentation were done. Then, a standard diagnostic arthroscopy using a 30-degrees and 70-degrees scope. After identifying the coracoid bone and using the shaver and coagulation to clean the coracoid base. Then using the AC guide, we made an incision 1.5 cm over clavicle then drilled through passing to the base of coracoid which was checked by x-ray then to pass the dog-bone arthroscopically. The last step was to fiber wire on top of the dog – bone over the clavicle and check the reduction (**Figure 2**).

Post-operative physiotherapy consists of pendulum exercises for 2 weeks, then light activities at 4 weeks. The active range of motion is encouraged at 6 to 8 weeks with resistance initiated at 12 weeks. Return to sports and manual labor are permitted only after the full range of motion and strength are obtained.



Figure 1: AP view X-ray for right shoulder show Rockwood type V (ACJ) dislocation



Figure 2: post op AP view X-ray for right shoulder show anatomical reduction of (ACJ) with dog-bone

## DISCUSSION

The clavicle is known to have an important role in linking between the thorax and the superior arm. One of the true synovial joints is ACJ, it is stabilized by 3 ligaments acromioclavicular (AC), coracoclavicular (CC) and coracoacromial (CA).

Different directional forces are stabilized by different ligaments, the most important ligaments are the AC and CC ligaments. The anteroposterior plane is stabilized by the AC ligament with both anterior and posterior portions. The medial conoid and lateral trapezoid ligaments are the elements of the CC joint which are considered as a complex ligament. These portions act to resist motion in the vertical plane which is mainly on the moment of abduction.

Also, the scapulohumeral motion is guided by the CC ligament, through its attachments to the clavicle and scapula through the coracoid process. A strong characteristically triangular-shaped ligament, which is the CA ligament has the main role as a superior restraint against humeral translation<sup>(6,9)</sup>.

Arthroscopic treatment is satisfactorily to restore ligament and joint anatomy. **Clavert et al.**<sup>(7)</sup> collected case series of 96 men and 20 women, mean age 37 years old. No intraoperative complications were reported. There were 11 complications due to hardware failure resulting in a loss of reduction, 1 coracoid fracture, 7 cases of adhesive capsulitis, 2 local infections, 5 cases of hardware pain. There were significant differences in outcomes between patients who did and did not develop complications. Forty-eight patients had persistent dislocation > 150% on an AP X-ray which affected the pain and activity. These patients no effect on their daily activity, but they could not return to the same level of sports activities due to persistent pain.

**Zhang et al.**<sup>(5)</sup> they compared the clinical outcomes of two different interventions for Rockwood type III (or above) (ACJ) dislocation and studied the factors influencing postoperative functional recovery. A total of 60 patients with Rockwood type III (or above) acromioclavicular dislocation were included in their study. Patients were categorized into two groups: clavicular Hook Plate Fixation (Group A) and EndoButton technique (Group B). Constant shoulder score was employed for the assessment of functional recovery before and after the surgery.

The constant score was significantly improved after surgery for both groups. The score was better in Group B than Group A in the sixth month after surgery but showed no significant difference in the fifteenth month. However, the EndoButton technique is more

effective for early functional recovery. These satisfactory anatomic results correlated with very good clinical outcomes encourage using this technique.

**In conclusion,** the rationale for an arthroscopic approach to treat a dislocated AC joint is to minimize the soft tissue injury through preserving as much blood supply as possible to support post-operative healing and also to decrease the risk of surgical site infections. On the other hand, the arthroscopic technique needs an experienced surgeon.

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