Surgical Management of Acromioclavicular Dislocations

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KEYWORDS

• Acromioclavicular dislocation • Anatomic reconstruction • Military population

KEY POINTS

- Acromioclavicular (AC) injuries are a common and disabling injury in a military population.
- Physical requirements often require a more aggressive treatment approach in this population.
- There is emerging research to support more anatomic reconstructions.
- In spite of these anatomic approaches, AC joint separations remain a challenging condition to treat.

INTRODUCTION

Epidemiology

Acromioclavicular (AC) separations are common injuries that recently have been the topic of increasing discussion in the literature. The incidence of AC injuries has been reported at 1.8 per 10,000 inhabitants per year in the general population.[1,2] Football players are at an increased risk of sustaining an injury to the AC joint and this risk increases with level of competition.[3,4] Similarly, an increased incidence has been reported in military populations up to 92 per 10,000 person years.[5] The AC ligamentous complex is critical to normal function of the shoulder girdle; disruption of these ligaments can lead to significant changes in shoulder mechanics and scapular dyskinesis, including a significant impact on activities such as bench press.[6–10]

Pertinent Anatomy

The AC joint is a diarthrodial joint with an intricate ligamentous complex that includes a dense capsule that surrounds the joint, in which is an intraarticular disk. Surrounding the capsule are the AC ligaments that provide the primary anterior-posterior (AP)

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stabilization, in particular the posterior and superior portions.[11] Just medial to the AC joint are the coracoclavicular (CC) ligaments, which are the primary stabilizers to superior-inferior motion (**Fig. 1**).[11]

The anatomy of the AC joint complex has been thoroughly described. Earlier publications focused on specific length and measurements for the insertion points of the CC ligaments.[12–14] Rios and colleagues[15] performed an anatomic study that found similar absolute measurements of the ligament insertion point from the lateral end of the clavicle; however, they divided these by the clavicular length to establish a ratio, which was very consistent across all their specimens. The average ratios for the conoid and trapezoid tunnels were 0.24 and 0.17 respectively. Using this idea, Cook and colleagues[16] retrospectively reviewed 28 patients who had undergone anatomic CC ligament reconstructions and found that placement of the conoid tunnel medial to a ratio of 0.25 was a risk factor for early loss of reduction (**Fig. 2**).

Classification

The Rockwood classification is the most commonly used classification and is summarized in **Table 1**.[17] A single radiograph of both clavicles with a Zanca view should be used. The CC distance is then measured and compared with the contralateral side. In cases where the status of the CC ligaments is unclear, a weighted view may be obtained and the CC distance will significantly increase compared with the contralateral side if they have been disrupted. Posterior displacement and thus the diagnosis of a type IV, is best assessed on an axillary radiograph.

The "Optimal Technique"

A recent systematic review reported that more than 150 variations have been described to treat symptomatic AC joint separations.[18] One could conclude from this that there is currently no single technique that has been proven clearly superior to all others.[19] Techniques have included various pins, plates, screws, and suture constructs, many of which are still in use. The Weaver-Dunn procedure and modifications of it have been used since it was first described. Many new techniques and biomechanical studies still use the Weaver-Dunn as a comparison group.[20–23]

To date, no reconstruction technique can duplicate the stability and physiology of a native, intact AC joint complex. However, several biomechanical studies have

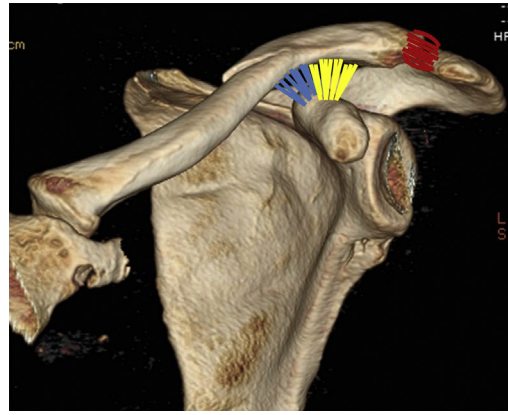

Fig. 1. The ligamentous complex surrounding the acromioclavicular joint. The acromioclavicular (*red*), trapezoid (*yellow*), and conoid (*blue*) ligaments are noted.