Combined Coraco-Clavicular & Acromio-Clavicular Reconstruction VS. Coraco-Clavicular Reconstruction Only For Acute Acromio-Clavicular Joint Dislocation, A Systematic Review & Meta-Analysis of Literature

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بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ
وَأَنْزَلَ اللهُ عَلَيْكَ الْكِتَابَ
وَالْحِكْمَةَ وَعَلَّمَكَ مَا لَمْ تَكُنْ
تَعْلَمُ وَكَانَ فَضْلُ اللهِ عَلَيْكَ
عَظِيمًا
صدق الله العظيم

First thanks to **ALLAH** *to whom I relate any success in achieving any work in my life.*

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List of Abbreviations

Abb.	Full term

CC .....Coraco-Clavicular

AC .....Acromio-clavicular

PRISMA.....Preferred reporting items of systematic reviews and meta-analysis

DASH…… ..Disability of the arm, shoulder and hand

VAS…….. ..Visual analogue score

ASES…….. ..The American shoulder and elbow surgeons

ABSTRACT

Background: The acromio-clavicular (AC) joint serves as the main articulation that suspends the upper extremity from the trunk. Acromio-clavicular joint injuries account for about 12% of all shoulder injuries in clinical practice and nearly 50% in athletes participating in contact sports. Isolated coraco-clavicular (CC) ligament reconstruction by high strength suture cerclage and combined AC and CC ligaments reconstruction by high strength suture cerclage are surgical methods for treating acute AC dislocation from grade III to grade V. The aim of this study is to conduct a systematic review of literature to evaluate & compare both techniques for reconstruction of acute AC joint dislocation type III, IV & V.

Methods: 7 studies (from 2006-2017) were included (4 studies about combined AC & CC ligaments reconstruction by high strength suture cerclage & 3 studies about isolated CC ligaments reconstruction by high strength suture cerclage) and reviewed the results of total 176 patients (55 patients in the isolated CC ligaments reconstruction by high strength suture cerclage group and 121 patients in the combined AC & CC ligaments reconstruction by high strength suture cerclage group) in terms of: function scores (constant score, visual analogue " VAS "score, disability of the arm, shoulder and hand "DASH" score & the American Shoulder and Elbow Surgeons shoulder "ASES" score) , CC distance difference, CC

distance and recurrence rate during post-operative follow up for 24 months.

Results: Isolated CC ligaments reconstruction showed statistical significant lower VAS score, higher constant, and lower CC distance difference and CC distance compared to combined AC and CC ligaments reconstruction for treatment of acute AC dislocation type III, IV & V. regarding the recurrence rate during 24 months of post-operative follow up, there is no significant statistical difference.

Conclusion: The results of this systematic review of literature suggest that the isolated CC ligaments reconstruction method is preferred than the combined AC & CC ligaments reconstruction method for surgical management of acute AC dislocation grade III, VI & V in terms of VAS score, DASH score, ASES score and constant score, the results show non significant statistic difference between two methods regarding the recurrence rate.

Keywords: **"** acute acromio-clavicular dislocation **"**, **"**coraco-clavicular reconstruction**"** & **"**acromio-clavicular reconstruction**"**.

INTRODUCTION

The Acromio-clavicular (AC) joint is one of four joints that comprise the shoulder complex, formed by the junction of the lateral clavicle and the acromion process of the scapula. Both ends of the articular surface are covered with hyaline cartilage with an interposed fibrocartilaginous disk of widely varying sizes. The AC joint serves as the main articulation that suspends the upper extremity from the trunk [1]. It subsequently coordinates normal movement of the glenohumeral, scapulothoracic, and sternoclavicular joints.

The primary functions of the AC joint are to allow the scapula additional range of rotation on the thorax, allow for adjustments of the scapula (tipping and internal/external rotation) outside the initial plane of the scapula in order to follow the changing shape of the thorax as arm movement occurs and allow transmission of forces from the upper extremity to the clavicle[2].

The AC joint has a thin capsule lined with synovium. The capsule is weak and is strengthened by capsular ligaments, which in turn are reinforced through attachments from the deltoid and trapezius[3]. The AC ligaments, consisting of anterior, posterior, superior, and inferior ligaments, surround the AC joint. The fibers of the superior AC ligament, which are the strongest of the capsular ligaments, blend with the fibers of the deltoid and trapezius muscles, which are attached to the

superior aspect of the clavicle and the acromion process. These muscle attachments are important in adding stability to the AC joint[4]. Without the superior and inferior capsular ligaments, the AC joint capsule would not be strong enough to maintain the integrity of the joint[5].

The most important ligaments are Coraco-clavicular ligaments which composed of the Conoid (posteromedial) and Trapezoid (anterolateral) ligaments. The Coraco-clavicular ligaments run from the coracoid process to the conoid tubercle and trapezoid line of the clavicle, near the AC joint. These ligaments contribute to vertical stability, making them crucial for preventing superior dislocation of the AC joint. The conoid ligament is the primary structure preventing superior displacement and rotation of the distal clavicle and runs from the centrally-situated conoid tubercle of the clavicle to the base of the coracoid process. By contrast, the trapezoid ligament is thought to primarily restrict anteroposterior translational forces across the clavicle and runs from the posterior margin of the clavicle to the base of the coracoid process[6].The most critical role of the coracoclavicular ligament is in producing the longitudinal rotation of the clavicle necessary for full ROM during elevation of the upper extremity[7].

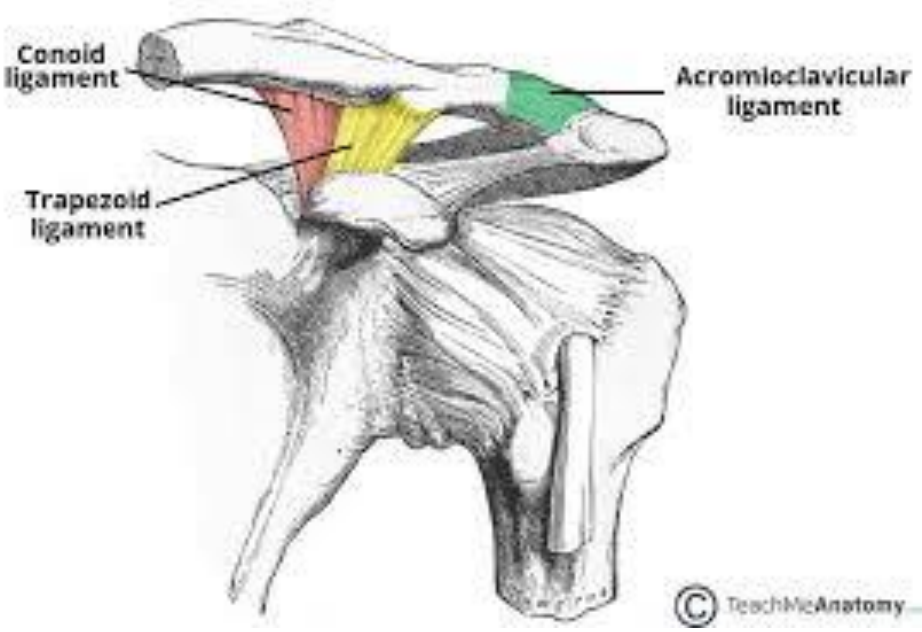

Figure (1): Showing normal anatomy of acromio-clavicular joint[8]

A healthy AC joint has been shown to accommodate 4–6 mm of translation in the anterior, posterior, and superior planes under a 70 N load[9].

AC joint injuries account for about 12 % of all shoulder injuries in clinical practice and nearly 50 % in athletes participating in contact sports [10]. Furthermore, this number likely underestimates the true prevalence since many individuals with minor (type I or II) injuries may not seek medical attention. AC joint injuries are much more common in men, likely due to risk-taking behaviors and participation in contact sports. The third decade of life seems to produce the greatest number of AC joint injuries[11]. The sports most likely

to cause AC joint dislocations are football, soccer, hockey, rugby, and skiing, among others.

Figure (2): Showing common mechanism of injury for AC joint[4]

The patient typically presents using their contralateral hand to support the elbow from beneath the injured shoulder. Shortness of breath should alert the orthopedist to a potential pulmonary contusion or pneumothorax. Abrasions, swelling, and ecchymoses may be present on a prominent distal clavicle secondary to inferior displacement of the shoulder girdle[12].

Provocative tests for AC joint pathology (cross arm adduction and loading of the AC joint) can be helpful to localize shoulder pain to the AC joint. These tests are especially useful in patients with type I and II (minor) injuries in which visible or palpable deformity may not be apparent[13].

Figure (3): Showing clinical picture of right AC dislocation[14]

Figure (4): Provocative test for suspected AC joint dislocation[15]