


## ACJ Injuries Indications, Techniques and Complications


**WINTER SKS**  
2018 SHOULDER, KNEE, & SPORTS MEETING

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THE ORTHOPEDIC  
**TOCA**  
CLINICAL ASSOCIATION



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University Medical Center  
Phoenix Campus

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### Disclosures

- Consultant: Arthrex
- Paid Speaker: Arthrex
- Royalties: Arthrex
- Research Support: Arthrex

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### AC Separations

- Prevalence of Type III or higher = 14.5/100,000
- High level, contact athletes
  - 32% of professional rugby players
- 9-12% of Traumatic shoulder injuries
- Association with intra-articular pathology >15%



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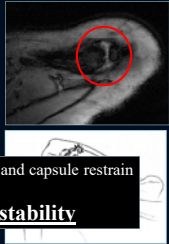
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### Acromioclavicular Anatomy

Superior AC ligament contributed 56% resistance to posterior displacement of the clavicle.

The Posterior AC ligament contributed 25% resistance to posterior displacement of the clavicle.

The acromioclavicular ligaments and capsule restrain anterior to posterior motion. They prevent **Horizontal Instability**.



Klimkiewicz et al. 1999 JSES      Fukuta et al. 1986 JBJS

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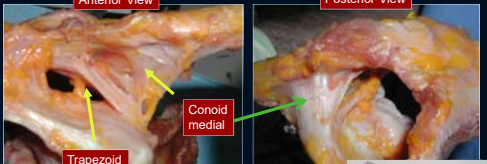
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### Coracoclavicular Ligaments

Anterior View      Posterior View



Trapezoid Lateral      Conoid medial

CC Ligaments are the Primary restraints to Vertical translation.

Rios et al, AJSM 2007

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### Physical Exam

- Cervical Spine
- Shoulder Joint
- Neurologic Exam
- Reducibility
- Degree of instability




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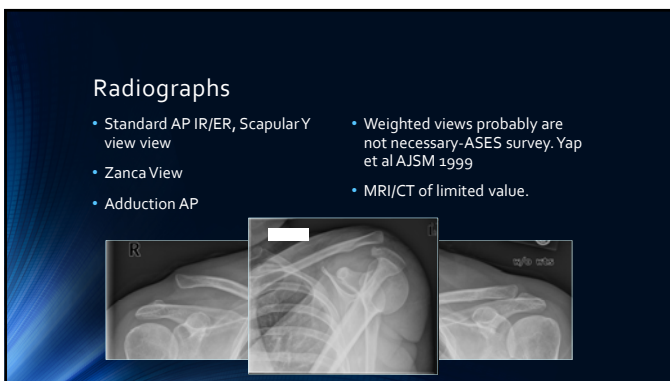
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Bilateral Zanca View-Source to image Distance 72 inches In combination with a tube voltage of 73-80 kV



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### Grade I and II

- Consensus-Non surgical treatment
- Immobilization for comfort
- Analgesics/injection
- Restore ROM
- Restore strength
- RTP when tolerated



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### Grade IV and V

- Surgical treatment is well accepted.



Grade III



- What surgical treatment???

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### History of Treatment

- Strapping from R. Watson- Jones
- Modern Commercial Brace



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### History of Treatment

- Anesthesia-1844
- 1<sup>st</sup> surgical description-1848



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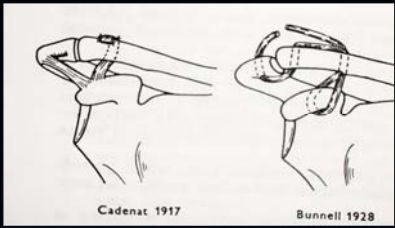
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### History of Treatment

- Fascial Slings



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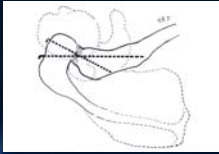
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### AC Joint wire fixation

- Murray 1940
- Phemister 1942




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### Coracoclavicular Screw Fixation

#### • Screws

- Vere Hodge 1940
- Bosworth 1941
- Rockwood



From R Watson-Jones

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### Treatment of Acromioclavicular Injuries, Especially Complete Acromioclavicular Separation\*

BY JAMES K. WEAVER, M.D.†, ALBUQUERQUE, NEW MEXICO, AND HAROLD K. DUNN, M.D.‡, SALT LAKE CITY, UTAH

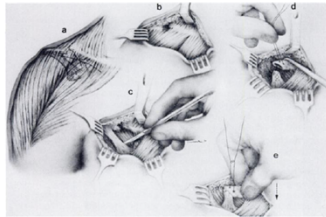


FIG. 4

Surgical repair of Type-II injury: (a) skin incision, (b) exposure of deltoid origin, trapezius superior and acromioclavicular injury, (c) deltoid reflected exposing coraco-acromial ligament, (d) distal two centimeters of clavicle resected and acromial end of coraco-acromial transferred into medullary canal, and (e) clavicle secured in anatomical position.

VOL. 56-A, NO. 6, SEPTEMBER 1972

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### Current Approaches to ACJ Surgery

- AC Joint Fixation
  - Suture
  - Pins
  - Graft
  - Plate
  - Ligament repair
  - DCE??
  - Nothing
- Coracoclavicular fixation
  - Screw
  - Suture
  - Suture anchor
  - Graft
  - Commercial Device
  - CA ligament
  - Single Column
  - Double Column(Anatomic?)

Arthroscopic vs Open Surgery  
Acute vs Chronic

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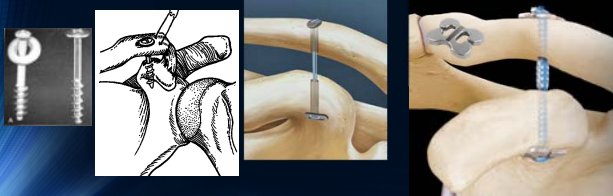
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### Coracoclavicular Fixation (Single Column)

- Screws



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### Coracoclavicular Fixation-Screws (Single Column)

- Open Surgery
- Small incision
- Recommended for Acute repairs
- Used as a primary device or with
  - ACJ direct repair
  - CA ligament transfer
- Screw removal necessary
- Reported complications
  - Fracture
  - Loss of fixation

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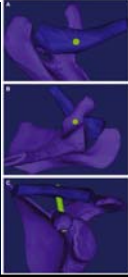
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**Anatomic considerations of transclavicular-transcoracoid drilling for coracoclavicular ligament reconstruction**

Robert M. Coale, MD<sup>1</sup>, Scott J. Hollister, PhD<sup>2</sup>, Joshua S. Dines, MD<sup>3,4</sup>, Answorth A. Allen, MD<sup>5</sup>, Asheesh Bedi, MD<sup>6,7\*</sup> *J Shoulder Elbow Surg* (2013) 22, 137-144

Study suggest that transclavicular-transcoracoid drilling for CC ligament reconstruction may be technically feasible but is associated with a significant risk of coracoid cortical breach and nonanatomic graft configuration. Utilizing a computer model




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**Coracoclavicular Fixation(Double Column)**



Walz et al AJSM 2008

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**Coracoclavicular Fixation-Suture/Button/Graft  
Single Column or Double Column**

• <u>Arthroscopic or Open</u>	• <u>Reported complications</u>
• Small incision	• Suture rupture
• Recommended for Acute	• Coracoid cutout
	• Button migration/subsidence
	• Coracoid fracture

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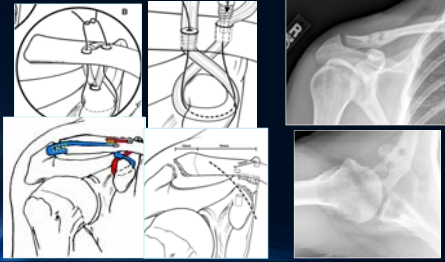
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### Coracoclavicular Fixation with Allograft (Double Column)

Anatomic Coracoclavicular Ligament Reconstruction (ACCR)  
Carofino, Mazzocca JSES 2010




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### Coracoclavicular Fixation with Allograft

- Open and Arthroscopic techniques
- Recommended for Acute, Chronic, Revision
- Require a stable coracoid
- **Reported Complications**
  - Rupture
  - Coracoid fracture
  - Clavicle fracture
  - Infection
  - Subluxation
  - Tunnel widening




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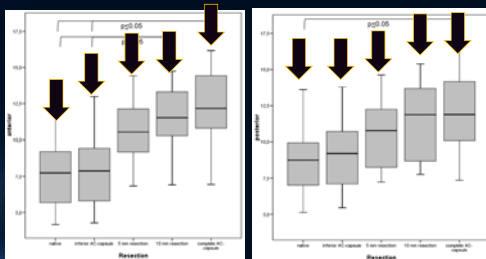
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### Increased Instability with DCE in the setting of injury NOT Arthrosis



Sequential Resection of the Distal Clavicle and Its Effects on Horizontal Acromioclavicular Joint Translation. Beitzel et al AJSM 2011

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Arthroscopic vs Open



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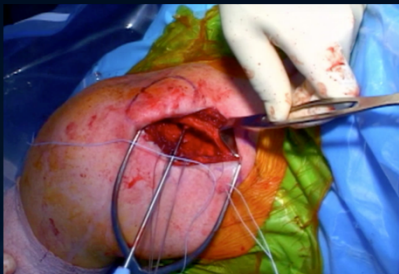
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Video Courtesy Augustus Mazzocca, MS MD

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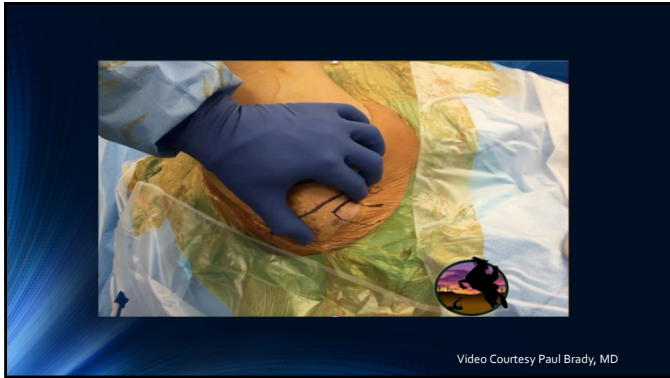
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Video Courtesy Paul Brady, MD

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### Fixation and Biologic



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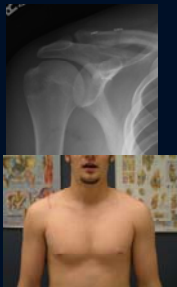
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### Postoperative Protocol

- Weeks 0-6 weeks
  - Sling/gunslinger 6
- Weeks 6-12
  - Restore Active ROM
  - Scapula stabilizers
- Weeks 12-16
  - PRE's
- Return to contact sports 6 months



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### Complications

- Failure to maintain reduction
- Infection
- Coracoid Fracture
- Tunnel Widening
- Clavicle Fracture




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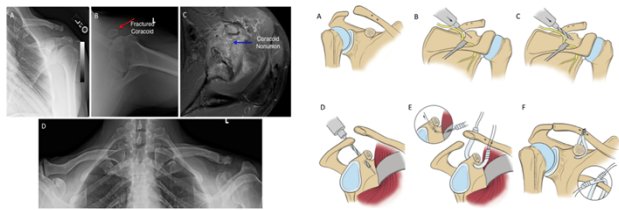
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### Coracoid bypass procedure: surgical technique for coracoclavicular reconstruction with coracoid insufficiency

Mandeep S. Virk, MD\*, Evan Lederman, MD\*, Christopher Stevens, MD\*, Anthony A. Romeo, MD\*\* JSES 2017




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### Summary

#### ACUTE

- Individualize treatment
- Coracoclavicular reduction with fixation
- ACJ ligament repair
- Save the Clavicle

#### CHRONIC

- Graft reconstruction +/- Fixation
- Repair the ACJ ligaments
- Horizontal Instability

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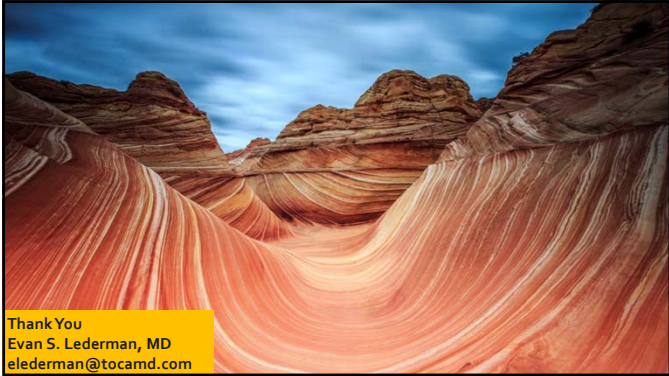
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