

Acromioclavicular and Sternoclavicular Injuries in the Athlete

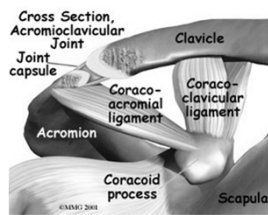
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Disclosure Statement

NO INTERESTS PERTAINING TO INFORMATION
GIVEN IN THIS PRESENTATION

Acromioclavicular (AC) Joint

- Functional Anatomy
 - Bony
 - Distal clavicle
 - Clavicular facet of Acromion
 - Ligamentous (Capsular)
 - AC joint capsule
 - Meniscus homologue
 - Coracoclavicular ligaments
 - Muscular
 - Deltotrapezial fascia



Mechanism of Injury

- “Separated” Shoulder
- Fall on adducted shoulder
- Downward directed blow to lateral shoulder
- Axial loading



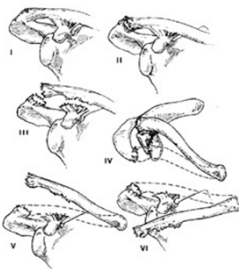
Clinical Evaluation

- History
 - Mechanism of Injury
- Physical Examination
 - Inspection
 - Palpation
 - Range of Motion
 - Neurovascular Exam



Injury Classification

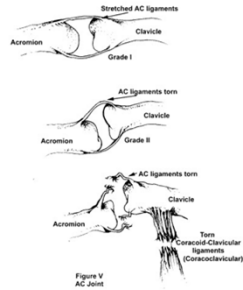
Figure 1. Classification of AC joint separation.



- Degree of relative displacement enables prediction of associated injuries
- Aids in decision making for treatment and helps predict outcome

Treatment

- Type I
 - Sling for comfort
 - Begin ROM as tolerated
 - 7-10 days
- Type II (50% displacement)
 - Sling immobilization (10-14 days)
 - Compression bandaging (3-6 weeks)



Treatment (Cont'd)

- Type III (100% displacement)
 - Controversial
 - Non-operative
 - Sling and harness
 - Sling immobilization
 - Operative
 - Multiple procedures have been described
 - Stabilize the AC joint
 - Repair/reconstruct the CC ligaments



Treatment (Cont'd)

- Type IV, V, and VI
 - Operative management
 - Open reduction
 - AC joint stabilization
 - Coracoclavicular ligament repair/reconstruction/augmentation
 - Coracoacromial ligament transfer
 - Repair of Deltotrapezial fascia



Type III Injuries

- Acute management is controversial
- Data indicates similar outcomes with both non-operative and operative treatment
- Differences are typically subjective
- Place for operative management in the overhead athlete (McFarland et al. Am J Orth., 1997)

Chronic AC Instability

- Degenerative changes at the AC joint
- Type I and II
 - Distal clavicle excision
- Types III-VI
 - Distal clavicle excision
 - +/- Coracoacromial ligament transfer
 - Coracoclavicular ligament reconstruction or screw fixation

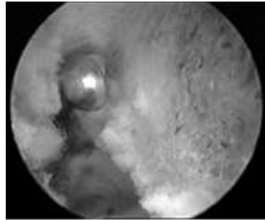
Distal Clavicle Osteolysis

- "Weight lifter's" shoulder
- Results from repetitive loading of the AC joint
 - Military Press
- Degenerative changes of the AC joint
 - Loss of joint space
 - Bone spur
 - Cyst formation



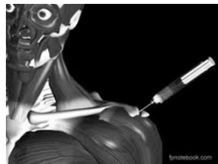
Distal Clavicle Osteolysis

- Clinical signs
 - Pain with overhead activity and lifting
 - Tenderness to palpation at the AC joint
 - Swelling at the AC joint
 - Pain at AC joint with cross-body adduction
 - **Neck pain**
 - +/- Instability



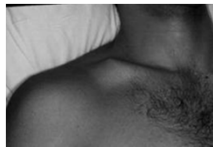
Distal Clavicle Osteolysis

- Treatment
 - Symptomatic care
 - NSAIDs
 - Activity modification
 - Intra-articular steroid injection
 - Return to activity
 - Operative management
 - Distal clavicle excision (Open vs. arthroscopic)
 - Early ROM >>> Active, resistive exercises 6-12 weeks



Clavicle Fractures

- Most common fracture of the upper extremity in contact athletes
- Similar mechanism as AC joint separation
- Treatment controversial
- Not all clavicle fractures created equal



Clavicle Fractures

- Type 1 (85%)
 - Midshaft
- Type 2 (10%)
 - Distal 1/3
- Type 3 (5%)
 - Medial 1/3

Clavicle Fractures-Type I

- Treatments
 - Nonoperative
 - Sling
 - Figure of eight strap
 - Operative
 - Degree of displacement
 - "Z" fragment
 - Compression plating
 - Intramedullary fixation

Clavicle Fractures-Type 2

- High rate of non-union with non-operative management
- Behave similarly to AC separations
- Can be challenging to obtain stable fixation

Clavicle Fractures-Type3

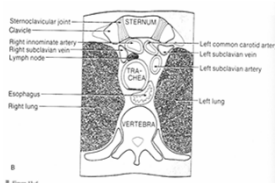
- Medial 1/3
 - Non operative
 - Sling for comfort
 - Return to play
 - Operative
 - Plating
 - Reconstruction
 - Beware of physcal injury

Sternoclavicular (SC) Joint

- Functional Anatomy
 - Bony
 - Medial Clavicle
 - Sternum
 - Saddle joint
 - Ligamentous (capsular)
 - Sternoclavicular ligament
 - Costoclavicular ligament
 - Articular disc
 - Interclavicular ligament



Sternoclavicular (SC) Joint



- Anatomical Relationships
 - Pulmonary
 - Trachea
 - lungs
 - Esophagus
 - Vascular Structures
 - Carotid artery
 - Inominate artery/vein
 - Subclavian artery/vein

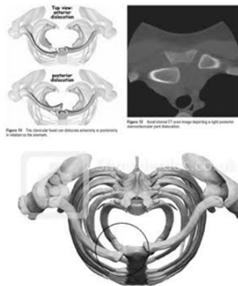
Sternoclavicular (SC) Joint



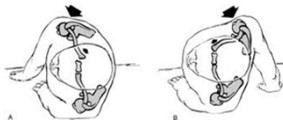
- Spectrum of Injury
 - Sprain>>Subluxation>>Dislocation
 - Chronic Instability
 - Physeal Fracture
 - First long bone to ossify
 - Medial epiphysis last to ossify (18 to 20 y.o.a.)
 - Last physis to fuse (23 to 25 y.o.a.)

Sternoclavicular (SC) Joint

- Injury Patterns
 - Anterior
 - Most common
 - Clavicle anterior to sternum
 - Visible prominence at SC joint compared to opposite side
 - Posterior
 - Less common
 - Flattening at SC joint
 - Compression of underlying structures



Sternoclavicular (SC) Joint



- Mechanism of Injury
 - Posterior Dx
 - Compression and "rolling forward of shoulder"
 - Anterior Dx
 - Compression and "rolling backward of shoulder"

Sternoclavicular (SC) Joint

- Evaluation and Acute Management
 - Mechanism of Injury
 - Physical Exam
 - Exposure
 - Assess airway/breathing
 - Neurovascular exam
 - Sling immobilization
 - Ice for 12-24 hrs

Sternoclavicular (SC) Joint

- Treatment
 - Sprain
 - Immobilization
 - Ice
 - Early ROM
 - Return to sport when full, painless ROM (7-10 days)
 - Subluxation
 - Immobilization
 - Ice
 - ROM
 - Return to activity 4-6 weeks

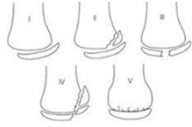
Sternoclavicular (SC) Joint

- Treatment (Cont'd)
 - Dislocation
 - Anterior
 - Closed reduction
 - Benign neglect
 - Surgical stabilization
 - Posterior
 - **Examine the Patient!**
 - Attempted closed reduction
 - Open reduction +/- reconstructive stabilization



Sternoclavicular (SC) Joint

- Medial clavicular physis is the LAST physis to close during skeletal development (20-22 yoa)
- Separation may actually be a physeal fx
- More chance for remodeling



Summary

- AC separation most common shoulder injury in the contact athlete
- Majority can be treated non-operatively
- Reconstruction of Coracoclavicular ligaments primary goal of surgery
- Sternoclavicular joint injuries uncommon
- Anterior dislocations can be treated with benign neglect
- Posterior Dislocations may compromise neurovascular and/or airway requiring urgent surgical intervention
- SC injury may be physeal fx with remodeling potential
