Acromioclavicular and Sternoclavicular Injuries in the Athlete

Michael D. Loeb, M.D.
Texas Orthopedics, Sports Medicine, and Rehabilitation Associates, P.A.
Austin, Texas

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

This presentation is the intellectual property of the author. Contact them for permission to reprint and/or distribute.
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
- 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
    • Costoclavicular 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 1

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

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

Sternoclavicular (SC) Joint
- Anatomical Relationships
  - Pulmonary
    - Trachea
    - Lungs
  - Esophagus
  - Vascular Structures
    - Carotid artery
    - Innominate 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