Acromioclavicular (AC) Injuries in Athletes

Bryan Reuss, M.D.

Disclosures
• Consultant- Arthrex, Inc.
• Consultant- World of Medicine, Inc.

Anatomy
Clavicle
• “S”-shaped bone
• Medial - sternoclavicular joint
• Lateral - acromioclavicular joint and coracoclavicular ligaments
• Muscle attachments:
  o Medial: sternocleidomastoid
  o Lateral: Trapezius, pectoralis major

AC Joint
• Diarthrodial joint between medial facet of acromion and the lateral (distal) clavicle.
• Contains intra-articular disk of variable size.
• Thin capsule stabilized by ligaments on all sides:
  o AC ligaments control horizontal (anteroposterior) displacement
  o Superior AC ligament most important

Distal Clavicle
• Coracoclavicular ligaments
  o “Suspensory ligaments of the upper extremity”
  o Two components:
    • Trapezoid
    • Conoid
  o Stronger than AC ligaments
  o Provide vertical stability to AC joint

Mechanism of Injury
Moderate or high-energy traumatic impacts to the shoulder
• Fall from height
• Motor vehicle accident
• Sports injury
• Blow to the point of the shoulder

Physical exam
• Evaluate for deformity (compare to other side)
• Palpate- Look for instability, reducibility
• Evaluate other parts of shoulder
• NV exam

Types of Injuries about the AC Joint
• Contusion/sprain
• Separation
• Fracture
AC/Shoulder Contusion/Sprain
- Most common injury
- Treatment is symptomatic

Fractures
Distal Clavicle Fractures
Non-Op Treatment
- Sling/PT/Symptomatic Treatment
- Deformity persists
- Pain and dysfunction- often persist

Operative Treatment
- Pinning
- Plating
- Alternatives...
  - 13-year old female
  - Deformity and skin tenting
  - Treatment
  - 3 weeks post-op
  - 12 weeks post-op
  - Case 2
  - Reville Slide
  - 3 weeks post-op
  - 12 weeks post-op
  - Acromion Fractures
- 38-y/o WM runs into auto while on bike
- Pain at point of right shoulder (acromion)

Acromion Fracture
Shoulder Separation
Not dislocation!!

Radiographs
Classification for Acromioclavicular Joint Injuries
- Initially classified by both Allman and Tossy et al. into three types (I, II, and III).
- Rockwood later added types IV, V, and VI, so that now six types are recognized.
- Classified depending on the degree and direction of displacement of the distal clavicle.

Type I
- Sprain of acromioclavicular ligament
- AC joint intact
- Coracoclavicular ligaments intact
- Deltoid and trapezius muscles intact

- AC joint disrupted
- < 50% Vertical displacement
• Sprain of the coracoclavicular ligaments
• CC ligaments intact
• Deltoid and trapezius muscles intact

Type III
• AC ligaments and CC ligaments all disrupted
• AC joint dislocated and the shoulder complex displaced inferiorly
• CC interspace greater than the normal shoulder (25-100%)
• Deltoid and trapezius muscles usually detached from the distal clavicle

Type III Variants
• “Pseudodislocation” through an intact periosteal sleeve
• Physeal injury
• Coracoid process fracture

Type IV
• AC and CC ligaments disrupted
• AC joint dislocated and clavicle displaced posteriorly into or through the trapezius muscle
• Deltoid and trapezius muscles detached from the distal clavicle

Type V
• AC ligaments disrupted
• CC ligaments disrupted
• AC joint dislocated and gross disparity between the clavicle and the scapula (100-300%)
• Deltoid and trapezius muscles detached from the distal half of clavicle

Type VI
• AC joint dislocated and clavicle displaced inferior to the acromion or the coracoid process
• AC and CC ligaments disrupted
• Deltoid and trapezius muscles detached from the distal clavicle

Treatment Options for Types I - II Acromioclavicular Joint Injuries
• Nonoperative: Ice and protection until pain subsides (7 to 10 days).
• Return to sports as pain allows (1-2 weeks)
• No apparent benefit to the use of specialized braces.

• Type II operative treatment
  o Generally reserved only for the patient with chronic pain.
  o Treatment is resection of the distal clavicle

Treatment Options for Type III-VI Acromioclavicular Joint Injuries
• Nonoperative treatment
  o Closed reduction and application of a sling and harness to maintain reduction of the clavicle
  o Short-term sling and early range of motion
• Operative treatment
  o Primary AC joint fixation
  o Primary CC ligament fixation
  o Excision of the distal clavicle
  o Dynamic muscle transfers
• Type III Injuries: Need for acute surgical treatment remains very controversial.
• Most surgeons recommend conservative treatment except in the throwing athlete or overhead worker.
• Repair generally avoided in contact athletes because of the risk of reinjury.

Indications for Acute Surgical Treatment of Acromioclavicular Injuries
• Type III injuries in highly active patients
• Type IV, V, and VI injuries

Surgical Options for AC Joint Instability
• Coracoid process transfer to distal clavicle transfer (Dynamic muscle transfer)
• Primary AC joint fixation
• Primary Coracoclavicular Fixation
• +/- Distal Clavicle Excision with CC ligament reconstruction.

Indications for Late Surgical Treatment of Acromioclavicular Injuries
• Pain
• Weakness
• Deformity

Techniques for Late Surgical Treatment of Acromioclavicular Injuries
• Reduction of AC joint and repair of AC and CC ligaments
• +/- Resection of distal clavicle and reconstruction of CC ligaments (Weaver-Dunn Procedure or Anatomic)

Weaver-Dunn Procedure
• The distal clavicle is excised.
• The CA ligament is transferred to the distal clavicle.
• The CC ligaments are repaired and/or augmented with a coracoclavicular screw or suture.
• Repair of deltotrapezial fascia

Anatomic Reconstruction
• XRAY

Thank-You