Acromioclavicular Joint Injuries

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• No Disclosures
Clinical questions

- What are the surgical indications for AC joint injuries?
- How are AC joint injuries managed in high level throwing athletes?
AC joint injuries
• Ligaments
  – AC
    • Horizontal stability
  – Coracoclavicular
    • Conoid, Trapezoid
    – Vertical stability
AC joint injury

- Mechanism: usually direct force on superior lateral acromion, with adducted shoulder

- Failure of AC ligaments capsule → CC ligaments → deltotrapezial fascia
AC Joint Injury: physical exam

- Deformity
- Tenderness: AC, CC, surrounding structures
- Stability: AP, SI
- Reducibility
- X-arm adduction test
AC joint injury: physical exam

Deltotrapezial fascial intact?
AC Joint: Radiographic Evaluation

- AP, axillary, Zanca views
  - Pt. must be upright, not supine!
  - No stress views or weighted views
AC Joint: Radiographic Evaluation

• AP, axillary, Zanca views
  – Pt. must be upright, not supine!
  – **What is a Zanca view?**
  – Contralateral comparative views to compare coraclavicular distance
  – Don’t forget coracoid (espec. if CC distance normal despite elevated clavicle!) ??

• Avg. CC interspace 1.1-1.3 cm
  - Stress views/weighted views not productive.  **Why?**
Rockwood Classification for AC separation
AC joint injury: Treatment

- Type I, II:
  - Non-surgical tx
  - Sling for 1-2 weeks prn
  - Early PROM → AROM → Strengthening* as tolerated
    - *Closed chain scapular exercises and scapular retraction exercises
  - RTP when asymptomatic???
  - Risks?
  - Injection?
  - Osteolysis?
AC Joint Injury: Treatment

- Type I/II treatment outcomes: All do fine?

  - Bergfeld J. AJSM 1978
    - F/U of non-operatively tx’d Navy cadets
      - Type I 30% mild symptoms, 9% severe symptoms
      - Type II 42% mild symptoms, 23% severe symptoms
AC Joint Injury: Treatment

- Moushine E. Grade I/II AC dislocations: Results of conservative treatment. JSES 2003.
  - Case series
  - 33 pts, avg. age 25, 26 mos. avg. f/u
  - 9/33 (27%) went on to operative tx by final f/u (OA or DCO)
  - Remaining 24/33, 17 good/excellent, 7/33 (21%) fair/poor
    - Increased AP laxity, tenderness, pain w/ cross-arm test, worse Constant score
    - No difference b/t Grade I and II
    - 54% with + radiographic changes
  - TOTAL 48% inadequate outcome
Distal clavicle excision

- Robertson *AJSM* 2011
  - Arthroscopic Versus Open Distal Clavicle Excision: A Comparative Assessment at Intermediate-Term Follow-up
  - 100% open and 97% arthroscopic patients satisfied and would have surgery again
What about Type III AC injuries???
AC Joint Injury: Treatment

• Type III
    • Strength testing after third-degree acromioclavicular dislocations
    • 20 HS pitchers, f/u 2 yrs
    • Good strength, no symptoms
    • Recommend non-operative treatment
  – Schlegel T. *AJSM* 2001
    • Prospective study of 20 non-operative tx Grade III injuries
    • 4 of 20 considered suboptimal, only 1 requested surgery
    • Good motion, strength, 17% weaker bench press
    • NO OVERHEAD ATHLETES IN THIS STUDY
Type V AC Joint Injury

• Type III
  – Tibone et al, AJSM June 1992
    • Strength testing after third-degree acromioclavicular dislocations
    • 20 HS pitchers, f/u 2 yrs
    • Good strength, no symptoms
    • Recommend non-operative treatment
  – Schlegel T. AJSM 2001
    • Prospective study of 20 non-operative tx Grade III injuries
    • 4 of 20 considered suboptimal, only 1 requested surgery
    • Good motion, strength, 17% weaker bench press
    • NO OVERHEAD ATHLETES IN THIS STUDY
AC Joint Injury: Treatment

• Types IV-VI
  – Type IV-VI are high energy, especially VI, which may have multiple rib fxs, plexus or vascular injury!!
  – Typically, operative treatment
AC injury: early vs. late repair

  - ER did better than LR
  - ER 90% satisfied vs LR 45%
  - Prominent ACJ: ER 45%, LR 70%
  - Xrays f/u: ER 70% displaced, LR 85% displaced
Weaver-Dunn AC Reconstruction

- “Horizontal incision over AC joint”
- “Acromial end of CA ligament detached and shortened”
- “Distal 2 cm of clavicle excised”
- “Sutured CA ligament fed thru medullary canal of reduced distal clavicle and secured through drill holes”

Weaver JK, Dunn HK. Treatment of acromioclavicular injuries, especially complete acromioclavicular separation. *JBJS* 1972; 54A: 1187-1194
Modified Weaver Dunn

- DCE
- CA lig. transfer
- CC lig. reconstruction (auto vs allograft)
- CC lig. augmentation (braided PDS)
Modified Weaver Dunn

- Tauber M. Semitendinosus tendon graft vs. modified Weaver Dunn procedure for AC joint reconstruction in chronic cases. *AJSM* 2009
  - Prospective comparative study
  - Modified = 1cm DCE
  - CC reconstruction group did better subjectively, objectively (Constant, ASES) and radiographically
  - Cerclage wire had to be removed
Other Modifications

- “Anatomic reconstructions”
- Removable cerclage wire
- “Tight rope”
- No DCE???
- Intramedullary AC reconstruction
- Arthroscopic assisted reconstruction

- Most “do well”, but with better results if better reduction, no over correction, and maintenance of reduction.
Anatomic reconstructions
Distal Clavicle Excision

• Yes or No?
  – DCE *decreases* chance of having post-op symptoms related to AC joint (OA, DCO, mechanical disk symptoms)
  
  – DCE may *increase* forces on CC ligament reconstruction
    • CA lig transfer inadequate
    • Consider AC lig. reconstruction (Ladermann)
Summary: Clinical questions

• Non-operative management provides good outcomes – Type I, II, and III
• Even high level throwing athletes do well with non-operative management of Type III injuries
Thank You