Management of Acute Shoulder Injuries

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Outline of Presentation

• Shoulder anatomy review
• Physical examination
• Common injuries:
  • History
  • Physical exam
  • Management
• Less common injuries
Shoulder Anatomy

Four joints:

1) Sternoclavicular
2) Acromioclavicular
3) Glenohumeral joint: ball and socket joint
4) Scapulothoracic

NB: Glenoid covers only 25% of humerus
Static Stabilizers

- Glenoid labrum: anterior > posterior support
- Glenohumeral ligaments: superior, coracohumeral, middle, and inferior
- Joint capsule
Dynamic Stabilizers

Deep layer
• Rotator cuff: Supraspinatus, Infraspinatus, Teres minor and Subscapularis

Superficial layer
• Deltoid, Teres major, Long head of Biceps, Pectoralis major and minor
Scapular Movers

- Levator scapulae
- Trapezius muscle
- Serratus anterior
- Rhomboids
- Latissimus dorsi
- Pectoralis minor
Nerves

• Dorsal scapular nerve: supraspinatus and infraspinatus

• Axillary nerve: deltoid and teres minor

• Subscapularnerve: subscapularis and teres major
Diagnosis

- History
- Physical Examination
- Provocative Tests
- Diagnostic Tests (including imaging)
Physical Examination

LOOK
• Posture
• Alignment
• Joints
• Muscles
  • Asymmetry
  • Wasting
“Spot” Diagnosis???
Physical Examination

FEEL
- Joints
- Muscle
- Tendons
- Crepitus
Physical Examination

- Palpation:
  - Humeral head
  - Clavicle
  - Acromion
  - AC joint
  - Scapula
Physical Examination

MOVE

• GH joint
  • Forward flexion
  • “Scaption”
  • Abduction
  • Rotation: IR/ER
    • At side
    • 90° abduction
  • Combined
Physical Examination

MOVE:

- Scapula
  - True weakness i.e. long thoracic nerve
  - Poor scapular control:
    - Rehabilitation for stabilization!
Physical Examination

NEUROVASCULAR EXAM

- Motor
- Sensory
- Reflexes
- Pulses
- Capillary refill
- NB: NECK EXAM

Figure 1
Anatomy of the thoracic outlet
Special Tests

• Cervical spine:
  • Spurling test
  • L’Hermitte sign

• Thoracic outlet
  • Adson’s, Allen’s
  • Hyperabduction test
  • Roos’ test
Physical Examination

ROTATOR CUFF:
• **S** – Supraspinatus
• **I** – Infraspinatus
• **T** - Teres minor
• **S** - Subscapularis
• (Biceps)

NB: Need to distinguish pain-mediated weakness versus true weakness
Strength Testing

- **Supraspinatus**
  - Jobe’s test
  - “Empty can”
  - Subacromial grind

- **Infraspinatus**
  - External rotation
  - “Lag sign”

- **Teres minor**
  - Hornblower’s sign
Strength Testing

- Subscapularis
  - “lift-off” test
  - “abdominal press” or “belly off” test
- Biceps
  - Speed’s
  - Yergason’s
Physical Examination

SPECIAL TESTS:

• Cross-arm adduction
  • “scarf” sign
  • AC joint primarily

• Impingement tests
  • Neer’s sign
  • Hawkin’s sign
Physical Examination

SPECIAL TESTS:
• “Drop-arm” test
• Apley’s scratch test
• Subacromial injection test – diagnostic?
Physical Examination

INSTABILITY TESTS:

• Load and shift (+1,+2,+3)
• Sulcus (inferior instability)
• Apprehension test
• Relocation test
• “Surprise” sign
Physical Examination

- Posterior instability
- Jerk test
Acute Shoulder Injuries

- Acute glenohumeral dislocation:
  - Anterior
  - Posterior
  - (Inferior)
- Acromioclavicular separation
- Clavicular fractures
- Sternoclavicular subluxation
Somewhat age-dependent

- Young athletes:
  - Physeal injuries
- <25 y.o.:
  - GH dislocations
  - AC separations
- 40-60 y.o.:
  - Rotator cuff disease
- >60 y.o.:
  - Rotator cuff disease
  - Osteoarthritis

“Little-Leaguer’s” shoulder
Serious Conditions

• Missed fractures
• Missed posterior dislocations
• Missed vascular or neurologic injury
Anterior Shoulder Dislocation

- HISTORY:
  - Mechanism?
  - Duration of dislocation?
  - How was it reduced?
  - Numbness and tingling?
  - Past Hx.????
  - Other side???
  - Joint laxity????
Shoulder Instability
THE AXILLARY NERVE
Anterior Shoulder Dislocation

- To reduce or not?
  - Easier before muscle spasm sets in?
  - If athlete is a recurrent dislocator
- Must document neurovascular function first!
- Need for x-ray first?
Shoulder Dislocations
Complications

- Axillary nerve injury
- Brachial plexus, radial, other nerve damage
- Axillary artery damage
- Recurrent instability
Shoulder Dislocations
Complications

- Associated fractures:
  - Humerus
    - Head
    - Neck
    - Greater tuberosity
  - Glenoid
  - Coracoid
To reduce or not?

Hippocratic method

Traction-countertraction

Stimpson method

External rotation method

Patient self-reduction
Anterior Shoulder Dislocation

- After reduction:
  - Immobilize or not?
  - For how long?
  - Position? IR vs ER?
  - Bracing?
- When to refer:
  - Younger athlete
  - Contact or collision sport
  - Traumatic dislocation
Acromioclavicular Separations

• THE HISTORY:
  • Mechanism: Fall onto lateral shoulder/arm
  • Sudden anterior pain +/- deformity
Classification of AC Separations

Type I

Type II

Type III

Type IV

Type V

Type VI

Conjoined tendon of biceps and coracobrachialis
Type IV AC Separation
Type IV AC Separation

- AP projection
Type IV AC Separation

- Axillary views
Acromioclavicular Separation

- Grades I, II, III:
  - Conservative Rx
  - No need for x-ray views with weights
- Grade IV, V:
  - Wait and see?
- Grade VI:
  - May need surgery
Acromioclavicular Osteolysis

- Sub-acute injury
- Often in weight-lifters, overhead or shoulder-dominant athletes
- Frequently bilateral
- Treatment:
  - Injection
  - Surgery (Mumford procedure)
Sternoclavicular Injuries
Sternoclavicular Injuries

- Posterior dislocation may be a medical emergency!
- NB trachea, esophagus, great vessels
- Anterior/superior dislocation more of a management issue
Sternoclavicular Injuries
Sternoclavicular Injuries

1. Sternum
2. Left Clavicular Head
   (posteriorly dislocated)
3. Right Clavicular Head
4. Trachea
Sternoclavicular Injuries
Sternoclavicular Injuries
Burners or Stingers

Brachial Plexus

Musculocutaneous

Axillary

Radial

Median

Ulnar

C5
C6
C7
C8
T1
Clavicle Fractures

- **Mechanism:**
  - Fall onto shoulder (87%)
  - Direct blow (7%)
  - Fall onto outstretched hand (FOOSH injury)
Clavicle Fractures

- Associated injuries:
  - Brachial plexus
  - Vascular injuries
  - Rib fractures
  - Scapular fractures
  - Pneumothorax
Clavicle Fractures

- Figure-of-8 bandage
- ‘out of favor’
- Sling for comfort
Operative Management

- Neurovascular injury
- Severe chest injuries
- Open fractures
- Uncontrolled deformity
- Cosmetic reasons?
- Non-union
Vascular Issues

- Subclavian
- Axillary
Vascular Issues

Figure 1. A 19-year-old man presented with upper extremity swelling and cyanosis.
Vascular Issues

- Diagnosis
- Ultrasound Doppler imaging
- Anticoagulation
Scapular Fractures

- Potential damage to suprascapular nerve
- Traction
- Hematoma
- Nerve conduction studies not helpful - not positive for 4-6 weeks
Acute Rotator Cuff Disease

**HISTORY:**
- Sudden pain, usually associated with traumatic event
- No prior shoulder symptoms
- Dramatic decrease in function
- Intense pain
- WEAKNESS
When to Order X-rays

• Immediately:
  • ANY Decreased ROM
  • ANY Trauma
  • Suspected OA
  • When the patient just: “doesn’t fit”

• Follow-up:
  • Pain not responsive to conservative management
Diagnosis of Shoulder Pain

- X-ray shoulder:
  - Glenohumeral AP
  - Lateral scapula/outlet view
  - Axillary view (West Point)
  - Acromio-clavicular joint view
Ancillary Imaging

- **Ultrasound:**
  - Suspected *acute* RC tear
  - Suspected chronic RC tear
  - Confirm Tendinosis

- **MRI:**
  - ARTHROGRAM?
  - RARELY necessary
Principles of Shoulder Treatment

- Restore full ROM
- Strengthen the shoulder girdle and stabilizers of the shoulder
- Improve function
Thank you for your attention!