Evaluation & Treatment of Shoulder and Elbow Pain in the Adult Patient

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Disclaimer

I, William T. Crowe, have relevant financial relationships to be discussed, directly or indirectly, referred to or illustrated with or without recognition within the presentation as follows:

- None

Objectives

- Review anatomy of the shoulder and elbow
- Define elements of subjective history
- Discuss basic exam of the shoulder and elbow
- Discuss current treatment regimens for common problems

Anatomy

- Bony structures
  - Clavicle
  - Scapula
  - Humerus

Anatomy - clavicle

Anatomy - Scapula
Anatomy

- Connective tissue
  - Ligaments
  - Acromioclavicular
  - Hyaline cartilage
  - Fibrocartilage (labrum)

Anatomy

- Joint capsule

Anatomy

- Passive stabilizers
  - Ligaments
  - Joint capsule

Anatomy

- Active stabilizers (muscles)
  - Glenohumeral (aka Rotator Cuff)
    (supraspinatus, subscapularis, infraspinatus, teres minor)
  - Thoraco humeral (pectoralis major, latissimus dorsi)
  - Biceps brachii (crosses both shoulder & elbow)

Anatomy

- 4 separate joints
  - Glenohumeral
  - Acromioclavicular
  - Sternoclavicular
  - Scapulothoracic
Anatomy
planes of motion
- Flexion & extension
- Internal & external rotation
- Abduction/adduction
- Circumduction (combination of above)

Anatomy
normal ROM
- 180 degrees flexion
- 45 - 60 degrees extension
- 150 degrees abduction
- 90 degrees external rotation
- 70-90 degrees internal rotation

Anatomy
bony structures
- Humerus
- Radius
- Ulna

Anatomy
connective tissue
- Ligaments (4 primary)
  - UCL*, RCL, Annular, Quadrate

Anatomy
passive stabilizers
- Ligaments (UCL, RCL, Annular, Quadrate)
- Joint capsule

Anatomy
active stabilizers
- Flexors (biceps brachii, brachioradialis, brachialis)
- Extensors (triceps, anconeus)
- Supinators (supinator, biceps brachii)
- Pronators (pronator quadratus, pronator teres, flexor carpi radialis)
Anatomy*

- 3 separate joints
  - Humeroulnar
  - Humeroradial (radiocapitellar)
  - Proximal radioulnar

Anatomy

- Planes of motion
  - Flexion & extension
  - Internal & external rotation

Normal ROM

- 140 - 150 degrees flexion
- 0 - 10 degrees extension
- 90 degrees supination (forearm)
- 80 - 90 degrees pronation (forearm)

Subjective/History

- Where does it hurt?

Location of pain*

- Anterior = superior shoulder
  - Pathology of AC joint
- Lateral deltoid
  - RC, adhesive capsulitis, OA of glenohumeral
### Location of Pain
- Lateral/medial elbow
  - Tendonitis
  - Ligamental injury
- Olecranon
  - Bursitis

### Subjective/History
- Where does it hurt?
- When did it start?
- What happened?
- If injury, ROM?
- Previous injury
- RECONSTRUCT THE STORY

### Subjective/History
- Severity - rest & activity
- Instability
- Alleviating/Aggravating factors
- Treatment to date
- Review of PMH/PSH/MEDS/DA

### Objective/Exam
- Always begin by assessing:
  - cervical spine
  - shoulder
  - general neurovascular examination

### Objective/Exam
- Observation
  - “can’t see, can’t treat”
  - BOTH shoulders

### Objective/Exam*
- Observation
  - Deformity
  - Swelling
  - Atrophy
Objective/Exam

- Inspection
  - Swelling
  - Ecchymosis
  - Deformity
  - Atrophy

Objective/Exam

- Palpation
  - AC & SC joints
  - Cervical spine
  - Biceps tendon
  - Anterior glenohumeral joint
  - Coracoid process
  - Acromion
  - Scapula

Objective/Exam

- Palpation
  - Bones
    - Epicondyles
    - Supracondylar lines
    - Olecranon and fossa
    - Radial head

Objective/Exam

- Maneuvers
  - ROM (active & passive)

Objective/Exam

- Maneuver
  - Spurling’s Test

Objective/Exam

- Maneuvers
  - Wall pushup
**Objective/Exam**

- **Maneuvers**
  - Empty can – supraspinatus

**Objective/Exam**

- **Maneuvers**
  - Resisted external rotation – infraspinatus/teres minor

**Objective/Exam**

- **Maneuvers**
  - Neer’s test – impingement of the RC under coracoacromial arch

**Objective/Exam**

- **Maneuvers**
  - Hawkins’ test – subacromial impingement or RC tendonitis

**Objective/Exam**

- **Maneuvers**
  - Subscapularis
    - Liftoff
    - Belly press

**Objective/Exam**

- **Maneuvers**
  - Cross arm test – AC joint disorder
**Objective/Exam**

- **Maneuvers**
  - Long head of Biceps
  - Speed test – outstretched arm, palm up

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**Objective/Exam**

- **Maneuvers**
  - Lateral epicondylitis
  - Medial epicondylitis
  - UCL stability
  - MCL stability

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**Objective/Imaging**

- Radiographs
- CT scan
- MRI

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**Objective/Imaging**

- Missed diagnosis – Dislocation for several months
- MUST get 2 views
Objective/Imaging

2012, "Fingers to Toes", UTSW, Chris Espinoza, MD

Objective/Imaging

AP thorax             True AP

2012, "Fingers to Toes", UTSW, Chris Espinoza, MD

Objective/Imaging

Axillary Lateral

2012, "Fingers to Toes", UTSW, Chris Espinoza, MD

Objective/Imaging

96 asymptomatic patients
- 34% (33/96) with RC tear
- 54% (25/46) > 60 y/o with RC tear

Sher et al, JBJS 1995

Objective - Studies

anteroposterior view
humerus
ehbow joint
radius
tenas
Shoulder pain*
- 3rd most common musculoskeletal complaint
- 2nd most common referral to ortho
- ~ 20% of all Americans will experience in their lifetime
- 8-13% of athletic injuries

Rotator Cuff pathology
- Impingement Syndrome
  - Subacromial bursitis
  - Rotator cuff tendonitis
  - Rotator cuff tendon tear

Impingement Syndrome*
- Prevalence
  - As of 1/2010, no documented studies for prevalence of ~ 5-40% of general pop may have but no pain
- Causes
  - Acromial morphology (hooked)
  - Osteophytes
  - Trauma (macro & micro)
  - Repetitive overhead activity
  - Subacromial bursa

Impingement Syndrome*
- Subjective
  - Gradual increase in pain
  - Pain increases with overhead motions
  - Difficult to sleep, especially on affected shoulder

Impingement Syndrome*
- Objective
  - Pain with abduction/flexion of the shoulder
  - Neer's test +
  - Hawkins' test +
Impingement Syndrome

Subacromial bursitis / RC tendonitis
- Treatment
  - Conservative
    - Rest
    - NSAIDs
    - Physical Therapy
    - Cortisone injection
  - Surgical
    - Arthroscopic

RC tear*
- Treatment
  - Conservative
    - Rest
    - NSAIDs
    - Physical Therapy
    - Cortisone injection
  - Surgical
    - Arthroscopic
    - Mini-open
    - Open

AC pathology
- Chronic
  - Arthritis

AC pathology
- Acute
  - AC separation

AC pathology
- Subjective
  - Pain usually well localized, front of shoulder
  - Pain with motion, esp cross body

AC pathology
- Objective
  - Visible deformity
  - Pain on palpation
  - Cross-body adduction
AC pathology

- Treatment
  - Conservative
    - NSAIDs
    - Cortisone injections
  - Surgical
    - Distal clavicle excision
    - ORIF

Osteoarthritis

- Subjective
  - Gradual pain, usually centered in back of shoulder
  - Loss of motion
  - Age > 50

- Objective
  - Weakness in muscles, atrophy
  - Decreased ROM

Osteoarthritis

- Treatment
  - Conservative
    - NSAIDs
    - Physical therapy (with caution)
    - Cortisone injection - controversial
  - Surgical
    - Joint replacement

Osteoarthritis

- Subjective
  - Gradual pain, usually centered in back of shoulder
  - Loss of motion
  - Age > 50

- Objective
  - Weakness in muscles, atrophy
  - Decreased ROM
Instability
- Causes
  - Repetitive trauma
  - Recurrent dislocation

Subjective
- ‘loose’
- Hx of recurrent dislocations

Objective
- Apprehension test

Treatment
- REFER to Orthopedic specialist

Instability

Elbow pain
- No hard numbers

Tendonitis (epicondylitis)
- Age
  - 30 – 50 years of age (most common)
Tendonitis (epicondylitis)

- **Subjective**
  - Pain over epicondyle
  - Pain increases with grasping
  - May have burning sensation

- **Objective**
  - POP over the lateral or medial epicondyle
  - Lateral epicondylitis test +
  - Medial epicondylitis test +
  - No radiographic studies indicated

Lateral epicondylitis

Medial epicondylitis

Tendonitis (epicondylitis)*

- **Treatment**
  - Conservative (85-90%)
    - Rest
    - NSAIDs
    - Physical therapy
    - Bracing
    - Cortisone injection to site
  - Surgical (80%)
    - Epicondylar release

Sprain

- **Subjective**
  - Hx of trauma – direct blow or twisting
  - Throwing injury (UCL)
  - Pain
  - Joint instability
Sprain

- Objective
  - Swelling
  - Decreased ROM
  - Ligamental laxity
  - Valgus stress (milking)

Sprain*

- Treatment
  - Conservative
    - REST
    - RICE
  - Surgical
    - REFER if conservative Tx fails

Olecranon Bursitis

- Causes
  - Trauma
  - Extended pressure
  - Infection
  - Underlying medical conditions (RA, gout)

Olecranon Bursitis

- Objective
  - "Goose egg" to posterior elbow
  - Decreased ROM
  - Redness to posterior elbow
  - XR ?? (injury, infection)

Olecranon Bursitis

- Subjective
  - Pain/edema to posterior of elbow

Olecranon Bursitis

- Treatment
  - Conservative
    - RICE
    - NSAIDs
    - Antibiotics (infectious)
    - Aspirate (symptomatic relief)
    - Cortisone injection to site
  - Surgical
Cubital Tunnel Syndrome
Ulnar Nerve Entrapment

- **Prevalence**
  - 2nd most common compressive neuropathy
  - Males 3-8x > females

- **Cause**
  - ???

- **Risk factors**
  - Previous elbow injury/fx
  - Bone spurs

- **Subjective**
  - Hand (4th & 5th fingers) falls asleep when elbow flexed (sleeping, phone usage)
  - Aching to the medial elbow
  - Weakened grip

- **Objective**
  - Tinel’s sign +
  - Elbow flexion test +
  - EMG/NCV studies

- **Treatment**
  - Conservative
    - Soft splinting
    - NSAIDs
  - Surgical
    - Anterior transposition

Fractures