The SHOULDER
Ryan Dobbs, MD
Reno Orthopaedic Clinic

Introduction
- The “shoulder” consists of 3 joints and one articulation
  - Scapulothoracic articulation
  - Sternoclavicular joint
  - Acromioclavicular joint
  - Glenohumeral joint
    - Most mobile joint in body

Scapulothoracic articulation
- Snapping medial scapula
  - Diagnosis elusive
  - Rare, but treatable
  - Crepitation - Painless or Painful
    - Poorly understood
    - Treatments unpredictable

Sternoclavicular Joint
- Posterior dislocation is dangerous
- Anterior dislocation is benign
- Degeneration can cause pain
  - Resection is RISKY – undertaken with great caution and only when conservative measures exhausted

Acromioclavicular Joint
- Anatomy
  - Clavicle
  - Acromion
  - Coracoid

Glenohumeral Joint
- Anatomy
  - Humeral head
  - Glenoid
  - Labrum
  - Capsule and ligaments
  - Rotator cuff
  - Proximal biceps tendon

Shoulder Anatomy
Bony Anatomy
Glenohumeral Joint
Labrum
Glenohumeral Joint
- Labrum
  - Acute, unidirectional anterior or posterior instability
  - Multi-directional instability
  - Superior labral tears
- Rotator Cuff
  - Impingement
  - Acute tears
    - Throwers
    - Dislocation
  - Chronic tears
- Etiology
  - Articular cartilage
  - Avascular necrosis
  - Glenohumeral arthrosis
  - Rotator cuff arthropathy

Labrum

Muscles of the Rotator Cuff

Muscles of the Rotator Cuff

Rotator Cuff

Subscapularis

Supraspinatus

Supraspinatus muscle

Infraspinatus

Teres Minor

History
- “Tell me about your shoulder.”
  - Initiation of problem
    - Trauma
  - Modifiers
    - Aggravation
    - Alleviation
  - Activity
  - Position
  - Mechanical symptoms
  - Night pain

Differential Diagnosis for “shoulder pain”
  - Shoulder pain
Differential Diagnosis for “shoulder pain”
- Shoulder pain
  - Typically Anterior
  - Rotator cuff pain refers to deltoid insertion
  - Cubital tunnel syndrome common
- Cervical Spine
  - Posterior
  - Distal neurologic involvement
- Scapula
  - Posterior
  - Activity related
- Cardiovascular system

Physical Examination
- Inspection
  - Scapular winging
  - Infraspinatus wasting
  - AC joint deformity
  - Muscular symmetry
- Palpation
  - Tenderness
- Percussion
  - Tinel’s
- Auscultation
  - Crepitance

Physical Examination
- C-spine
- ROM
- Impingement
- Tenderness
- Sensation
- Strength
- Special tests
- Imaging
  - X-ray (Grashe, AP, axillary, outlet)
  - MRI (open-air, 1.5T, 3T, arthrogram)

Physical Exam - ROM
- Active and Passive
- Forward flexion
- Abduction
- External Rotation
- Internal Rotation
Internal Rotation

24 □ Physical Exam - Strength

25 □ Physical Examination - Strength

26 □ Special Tests

- Impingement
  - Neer
  - Hawkins
  - Cross-body adduction

- Labrum/Biceps
  - O’Brien’s
  - Speed’s
  - Yergason’s

- Instability
  - A/P drawer
  - Apprehension/Reduction
  - Sulcus
  - Generalized laxity signs
  - Jerk sign

27 □ Physical Examination
  Special Tests - Impingment

28 □ Physical Examination
  Special Tests - AC joint

29 □ Physical Examination
  Special Tests - SLAP tear

30 □ Physical Examination
  Special Tests - Biceps

31 □ Physical Examination
  Special Tests - Biceps

32 □ Physical Exam
  Special Tests - Instability

33 □ Physical Examination
  Special Tests - Instability

34 □ Physical Examination
  Special Tests - Instability

35 □ X-rays

36 □ MRI

- Injection vs. MRI?
  - MRI first if ANY doubt about RC integrity

- Open vs. Closed MRI?
Open vs. Closed MRI?
- Open only when absolutely no other choice (>400#)

Non-contrast MRI vs. MRI arthrogram?
- Plain MRI to r/o RCT
- Arthrogram for questions of instability or SLAP tear
  - rarely needed for > 40 yo
  - increases rate of rotator cuff tear false positives

MRI
1. Open MRI
   - Advantages:
     - Patient comfort
     - Cost?
   - Disadvantages:
     - Poor image quality

2. Closed tube MRI
   - Advantages
     - Improved image quality
     - More scanners
   - Disadvantages
     - Claustrophobia

MRI
1. Plain MRI
   - Indications:
     - Rotator cuff tears
     - Over 40 years old
     - Atraumatic
     - Deltoid insertion pain
     - When in doubt, MRI without

2. MRI Arthrogram
   - Indications:
     - Labral tears
     - Under 40 years old
     - Traumatic
     - History of dislocation

   NO indication for IV contrast
Common Shoulder Maladies

Common Maladies

- Glenohumeral Joint
  - Instability, SLAP, adhesive capsulitis, DJD
- Subacromial Space
  - Rotator cuff, Impingement, Calcific Tendinitis
- Acromioclavicular joint
  - Separation, DJD
- Biceps
  - Tendonitis, Instability, Tear
- Sternoclavicular Joint
  - Separation, DJD

Common Maladies

Instability

- Glenohumeral Joint - Instability
  - History:
    - Traumatic onset
    - Position of arm at time of injury
    - Reduction required in ER? Or Spontaneous?
  - Physical Exam
    - Apprehension, Reduction
    - Sulcus, generalized laxity signs
    - Jerk sign - posterior

Common Maladies

Instability

- Glenohumeral Joint – Instability
  - X-rays
    - Usually negative
    - Hill-Sachs lesion, bony bankart
  - MRI – ARTHROGRAM
    - Labral tear, HAGL lesion
  - Treatment - Age, activity level, concurrent pathology, recurrence

CONCERNS:
- Younger patients = Recurrence
- Older patients = Rotator Cuff Tear or axillary nerve injury

Common Maladies

SLAP tear

- Glenohumeral Joint - SLAP tear
  - History
    - Trauma (traction injury) vs. Insidious onset
History
- Trauma (traction injury) vs. Insidious onset
- Age (traumatic vs. degenerative)

Physical Examination
- O’Brien’s positive

44 Common Maladies

SLAP tear
- Glenohumeral Joint - SLAP tear
  - X-rays - negative, often acromial or AC path in degenerative
  - MRI - ARTHROGRAM (often inconclusive)
- Treatment:
  - PT
  - IA injection
  - SLAP repair (young, acute)
  - Biceps tenodesis and labral debridement (degenerative)

45 Common Maladies

Adhesive Capsulitis
- Glenohumeral Joint - Adhesive Capsulitis
- History
  - Painful ROM
  - Usually minor - moderate trauma followed by immobilization
  - Diabetes
- Physical Exam
  - Limited active AND PASSIVE ROM (esp. IR)

46 Common Maladies

Adhesive Capsulitis
- Glenohumeral Joint - Adhesive Capsulitis
- X-ray/MRI - non-diagnostic
- Treatment:
  - PT
  - NSAIDs
  - IA injection
  - Oral steroids
  - MUA
  - Arthroscopic LOA with A/P capsular releases (for recalcitrant cases > 1 year)

47 Common Maladies

DJD
Common Maladies
DJD

- Glenohumeral Joint - Degenerative Joint Disease
  - History
    - Progressive loss of motion and pain
    - "Tooth ache", "Grinding"
    - Night pain
  - Physical Exam
    - Limited ROM
    - Crepitation with motion

Common Maladies
DJD

- Glenohumeral Joint - Degenerative Joint Disease
  - X-ray
    - Diagnostic
  - MRI
    - Usually unnecessary
    - Can help differentiate the need for TSA vs. reverse TSA

- Treatment:
  - NSAIDs
  - IA injection (few)
  - TSA
  - Reverse TSA

Common Maladies
Subacromial Impingement

- History
  - Rare in < 40 yo
  - Pain with overhead reaching, lifting, sports
  - Positional pain

- Physical Examination
  - Neer, Hawkins, Whipple - positive
  - Normal PROM, RC strength

Common Maladies
Subacromial Impingement

- X-ray
  - Type 2/3 acromion very common
  - AC joint often degenerative
  - MRI - Tendinopathy

- Treatment
  - PT/NSAIDs, Injections
  - Arthoscopic subacromial decompression for failure of extensive conservative management
    - (usu find concomitant pathology)
(usu find concomitant pathology)

51 Common Maladies
Calcific Tendinitis
■ History
  ■ Impingement pain baseline
  ■ Intermittent episodes of severe, incapacitating pain < 1 week
■ Physical Examination
  ■ Neer, Hawkins, Whipple – positive
  ■ Painful ROM
  ■ Possible adhesive capsulitis

52 Common Maladies
Calcific Tendinitis
■ X-rays - diagnostic
■ MRI - often false negative
■ Treatment
  ■ Acute
    ■ Injection
    ■ NSAIDs
    ■ +/- narcotics
    ■ +/- oral steroids
  ■ Chronic
    ■ Injection, PT, NSAIDs
    ■ Chronic > 1-2 years w/ multiple bouts of acute reactions = consider arthroscopic excision in dormant phase

53 Common Maladies
Rotator Cuff Tear
■ History
  ■ Traumatic or insidious
  ■ Pain localizing to deltoid insertion
  ■ Pain with overhead reaching, lifting
  ■ Night pain
■ Physical Examination
  ■ Pain > weakness with RC isolation
  ■ Drop arm, lag signs with massive tears
  ■ Belly press/lift off with subscapularis tears

54 Common Maladies
Rotator Cuff Tear
■ X-ray - Humeral head elevation (acute or chronic massive), acromial and humeral head sclerosis with chronic massive
■ Treatment
  ■ Partial (PT, injections, repair if > 50%)
  ■ Full thickness < 5 cm retraction with minimal atrophy = repair
  ■ Full thickness > 5 cm, chronic, atrophy = conservative vs. RTSA
Full thickness > 5 cm, chronic, atrophy = conservative vs. RTSA

55 Common Maladies
   AC separation
   History
   Direct blow to the shoulder
   Physical Examination
   TTP over AC joint
   Pain w/ CB adduction
   Deformity in all but grade I

56 Common Maladies
   AC separation
   X-rays
   Deformity in all but grade I
   Clavicle views best
   MRI - unnecessary
   Treatment
   Conservative for all but grade 5 initially
   Reconstruction an option for symptomatic grades 3-6

57 Common Maladies
   AC joint arthritis
   History
   Pain with lying on the shoulder, reaching across the body or behind the back
   Common in weight-lifters, laborers, elderly
   Physical Exam
   TTP over AC joint
   Pain with CB adduction

58 Common Maladies
   AC joint arthritis
   X-rays
   DJD on AP, axillary views
   MRI
   Increased T2 signal at AC joint
   Treatment
   PT, NSAIDs, injections
   Arthroscopic DCR

59 Common Maladies
   Biceps pathology
   History
   Pain referable to anterior shoulder/biceps muscle
   Worsened with supination
   Physical Examination
   Positive Speed’s, Yergason’s, O’Brien
   X-ray
Positive Speed’s, Yergason’s, O’Brien
X-ray
Often acromial/AC joint pathology

**Common Maladies**

**Biceps pathology**

- MRI
  - Good for splitting of biceps or instability
  - Often difficult to evaluate intra-articular portion of biceps
  - Arthogram for SLAP tears

**Treatment**

- Eccentric strengthening in PT
- NSAIDs, Injection
- Biceps tenodesis

**THANK YOU**