Shoulder Pain: How to Make the Diagnosis

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Objectives

- Develop concepts of correlation anatomy, injury mechanism, PE and imaging to make correct diagnosis
- Show case-based examples of shoulder disorders
- Understand making the correct primary diagnosis will improve patient outcomes and management of shoulder pain patients

Differential Diagnosis

Think Joint
Mechanism
Joints (3) Glenohumeral One Event
SC
AC
Spaces (2) Repetitive
Subacromial
Scapulothoracic
Referred
Neck
Scapula
Lung
Ribs
Repetitive - No event

FUNCTIONAL ANATOMY: Joints

Primary Diagnosis

- Involved Structure
- Age Group
  - Younger Instability (<30 yrs)
  - Older Rotator cuff (>40 yrs)
- Diagnosis
  - Inflammation
  - Tear
  - Sprain
  - Instability

Elevation/Depression of the Scapula
Scapular winging indicates weakness of the serratus anterior muscle and is evident when the patient does a push-up or pushes against the wall.

Remember to examine scapular position

- Have patient reproduce symptoms
- If scapula is unstable, shoulder problems will result
- An unstable scapula is similar to firing a cannon out of a canoe
Scapular Dysfunction
- If exists, shoulder function is like firing a cannon out of a canoe!
- Remember the scapula!
  - Tightness anterior
  - Forward head
  - Overdeveloped pectoralis
  - Scapular movements
  - Touch medial borders
  - Elbows to back pocket
  - Shrugs
  - Clockwise/counterclockwise

Is the pain referred?
- Neck
- Scapula
- Lung
- Ribs
- Tumor

Muscle Testing

Abnormal Shoulder Differential Diagnosis

Rotator Cuff
Supraspinatus
Infraspinatus
Teres minor
The “SIT” Muscles
Palpate and Manual Muscle Test
Arm in varying degrees of abduction and rotation
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Rotator Cuff Testing
- Empty can position
- Weakness in external rotation

Be Specific:
The diagnosis should define the structure that is injured and the condition

Diagnosis Rotator Cuff
- Inflammation
- Tear
  - Partial vs. Complete
  - Articular side vs. Bursal side

Complete Tear
- Suspension bridge
  - Free side of tear (cable)
  - Attachments of tear
    - or (supports at each end)

MRI
- Full Thickness supraspinatus tear

Window shade to sill (cuff) (greater tuberosity)
Use this comparison for patient education

There are many clinical tests named after someone. Instead of description by name:
- Think of the motion of joint and forces you apply:
  - Is it labral?
    - (Axial loading like McMurray’s)
  - Is it the rotator cuff?
    - (compressing or impinging)
  - Is it instability?
    - (distraction of joint capsule subluxing the humeral head)
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Named Tests vs. Movement Description

- Many tests for biceps tendon disorders
- Think about patient history, anatomy and move the arm, load the joint to reproduce patient’s symptoms

Do the most painful part of the exam LAST

Tests for proximal biceps tendon dysfunction – long head

- Ludington’s
- Yergason’s
- Abbott and Saunders’
- DeAnquin’s
- Matsen’s
- Speed’s

Include these for complete exam
Rarely isolated biceps problem
Think associated tear subscap/labrum/RC

Yergason’s test

With the arm flexed, the patient is asked to forcefully supinate against resistance from the examiner’s hand.

Pain referred to the anterior aspect of the shoulder in the region of the bicipital groove constitutes a positive result.


Ludington’s test

The patient is asked to put his or her hands behind the head and flex the biceps. The examiner’s finger can be in the bicipital groove at the time of the test.

Subtle differences in the contour of the biceps are best noted with this maneuver. In this illustration the patient has a ruptured biceps at the left shoulder.


Abbott and Saunders’ test

DeAnquin’s test

Matsen’s test

Speed’s test

The biceps resistance test is performed with the patient flexing the shoulder against resistance, with the elbow extended and the forearm supinated.

Pain referred to the biceps tendon area constitutes a positive result.

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Labrum & Capsule

- Labral Function
- Stability
- Bumper
- Biceps attachment
- Shock absorber

Glenoid : Labrum

- Tee : Golf Ball
- Seal : Ball
- Contact Lens : Eyeball

Labral Function

Stability

Bumper

Biceps attachment

Shock absorber


- Prospective study
  - 61 shoulders, 62 patients
  - Tests Used
    - Jobe relocation test
    - O’Brien test
    - Anterior apprehension test
    - Bicipital groove tenderness
    - Crank test
    - Speed test
    - Yergason test
  - Only O’Brien and Jobe relocation test were statistically correlated with presence of labrum tear, including SLAP
  - Other five not found useful for labral tears
  - None of the tests or combinations statistically valid for SLAP lesion only

O’Brien’s Test

Shoulder Palpation Crank Tests

Shoulder Stability

40th Lexington Family Medicine Review, 5-14-09
18 YO Freshman Football Athlete

- 18 YO Freshman RB for EKU w/ dominant right shoulder injury
- Opening game, 8/31/2000
- No previous H/O injury
- Dead Arm Complaints
- Mechanism of Injury thought to be a lateral blow to the shoulder while being tackled

Clinic Radiographs

- Confirm humeral head radiolucency consistent with Hill-Sachs lesion

MRI

- Hill-Sachs lesion approx. 20%
- Anteroinferior Labral Detachment
- Anterosuperior Labral Detachment

Posterior Instability Test

Prone Posterior Instability Test
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Vicious Cycle: Laxity to Instability

Physiologic Laxity
Pathologic Instability
Subluxates Position of Humeral Head Inferior Anterior Posterior
Rotator Cuff partial tear

Physiologic Laxity can lead to pathologic instability is shown schematically.

Multi-Directional Instability

- Voluntary posterior direction - symptomatic

S/P Open anterior shoulder reconstruction
Multi-Directional Instability, bilateral shoulders.

18 YO Right-Hand-Dominant Discus Thrower

- Threw the discus
- Felt pop, pain, inability to move her arm
- Went to the emergency room

Posterior Dislocation

- X-rays showed humeral head posteriorly dislocated on axillary view
- This direction of dislocation still is missed in emergency rooms

ER view
Axillary

Posteriorly Dislocated

Stryker view

More symptomatic on operated right side.
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**Imaging**
- Plain films
- Make the diagnosis by history and physical and plain films
- Institute treatment
- Re-examine
- Then special Imaging Studies

**Initial Imaging**
- True AP in 0° external rotation
- Lateral in scapular plane
- Axially view
  - When imaging studies are indicated during the initial evaluation and treatment of a patient with shoulder pain, appropriate plain "x-rays" should be obtained. More sophisticated imaging studies (such as shoulder MRI, ultrasound, or arthrography) are not indicated.

**AP Internal View**

**Stryker Notch View**

**IMAGING**
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Outlet View

Outlet Upright View

Axillary Lateral View

Modified Axillary View in Humeral External Rotation

Subscapularis Muscle

Subscapularis Tears

- Lift Off (75% tear 5-30)
  - Hand or back Lspine
  - Maximum LR
- Napoleon (50% tear)
  - Press belly, flexes wrist
- Bear Hug (Upper tear, most sensitive)
  - Hand on opposite shoulder
  - Elbow forward
  - Examiner pulls hand off shoulder
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Initial Clinic Visit

- 46 year-old right-hand dominant male fell onto an outstretched right arm after tripping over his dog.
- Felt a ripping sensation in his shoulder
- Went to the emergency room, plain x-rays normal
- PE next day:
  - Pain diffusely anterior shoulder
  - Weakness, IR > ER

Biceps Tendon

- Often associated with:
  - Subscapularis tear
  - Chronic rotator cuff tears
- Presentation
  - Initial ecchymosis and pain, then feel better
- Treatment
  - Repair other associated tears
  - Tenodesis vs. tenotomy

Pectoralis Major Rupture

33 YO Male
- Bench pressing weights
- Weight amount he did ten years previously
- Felt a rip, pain, deformity, right pectoralis

34 YO RHD weight-lifter
Pain over AC joint s/p arthroscopy labral debridement 3 years previously
Right AC osteolysis

You May Not Have Seen It, But It Has Seen You
12 YO Male Soccer Athlete
- Pain in left shoulder, 1 to 2 years
- No injury
- PE: normal stability
- Mildly tender firm axillary mass

22YO LHD Male
- Multiple osteochondroma
- Girlfriend noted scapular asymmetry

True space occupying mass
- Causing “winging” and “snapping”
- Axial skeleton osteochondroma
- Underwent resection mass
- Diagnosis: osteochondroma, no malignant change

Imaging
- Special Studies
  - MRI scan
    - With or without gadolinium
  - CT scan
  - Ultrasound

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Ultrasonography

- In office
- Accurate
- Low cost


Ultrasound showing symptomatic progression of previously asymptomatic rotator cuff tear.


Differential Diagnosis Categories

- Rotator Cuff Disorders
  - Frozen shoulder
  - GH Instability
  - Arthrosis
  - AC Joint Disorder
  - Fibromyalgia


CONCLUSIONS

- Don’t order a test if you can’t read it.
- Communicate with the radiologist at your imaging center.
- A bad scan is worse than no scan.
- In KY, we have many MRI scanners. Shoulder scans are notoriously bad if ordered by someone who is unable to examine a shoulder.

CONCLUSIONS

“Sometimes an MRI report just doesn’t help...”
Conclusions

- By:
  - Knowing Anatomy
  - Understanding Biomechanics
  - Sport of injury
  - Mechanism
  - Physical Exam makes sense and Specific Diagnosis is made

Try to put the whole picture together

Treat the entire patient!

The End . . . Thank You!

Quit