

Presented by:  
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0:00 Introduction

0:19 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

0:45 Differential Diagnosis

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

3:14 FUNCTIONAL ANATOMY: Joints

3:33 Primary Diagnosis

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

4:49 Scapula Stabilizers

Elevators / depressors

Upward / Downward rotators

Protractors / Retractors

5:42 Elevation/Depression of the Scapula

6:36 Upward/Downward Rotation of the Scapula

7:09 Protractors and Retractors of the Scapula

7:57 Abduction/Adduction of the Shoulder

8:10 Flexion/Extension of the Shoulder

8:33 Scapular Winging

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

9:25 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

10:30 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

11:27 Scapular Winging Video

13:06 Like firing a cannon out of a canoe . . .

13:32 Is the pain referred?

- Neck
- Scapula
- Lung
- Ribs
- Tumor

13:47 Neurologic stretch injury from lifting heavy dumbbells, suprascapular (C5) nerve involved Video

15:24 Muscle Testing

16:46 Abnormal Shoulder Differential Diagnosis

18:44 Rotator Cuff Video

19:27 Rotator Cuff  
Supraspinatus  
Infraspinatus  
Teres minor  
The "SIT" Muscles

20:08 Internal and External Rotators

20:30 Rotator Cuff Testing

- Empty can position
- Weakness in external rotation

21:16 Be Specific:  
Diagnosis Rotator Cuff

- Inflammation
- Tear
- Partial vs. Complete
- Articular side vs. Bursal side

22:12 Complete Tear

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

22:32 Mobilization of cuff and view of sutures pulling cuff back to greater tuberosity Video

23:36 75 YO Male: Massive Rotator Cuff Tear

24:59 MRI

- Full Thickness supraspinatus tear

25:18 Window shade to sill  
(cuff) (greater tuberosity)

26:07 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)

28:12 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

29:28 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

30:52 Abbott and Saunders' test, DeAnquin's test, & Matsen's test

31:24 Speed's test Video

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.

32:03 Yergason's test Video

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.

32:35 Ludington's test Video

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.

33:31 Labrum & Capsule

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

35:09 Glenoid : Labrum

37:56 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

40:41 O'Brien's Test Video

41:11 Shoulder: Peel-back sign Video

45:32 If SLAP tear in young pitcher, assess RC for tear

48:29 Shoulder Palpation Crank Tests Video

50:35 Shoulder Stability Video

51:23 18 YO Freshman Football Athlete

- 18 YO Freshman RB for ECU 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

51:42 Clinic Radiographs

- Confirm humeral head radiolucency consistent with Hill-Sachs lesion

52:17 Axillary views – Regular & Modified

52:51 MRI

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

55:58 Posterior Instability Test Video

56:44 Prone Posterior Instability Test Video

57:32 Vicious Cycle: Laxity to Instability

59:23 Multi-Directional Instability Video

- Voluntary posterior direction – symptomatic

1:00:45 S/P Open anterior shoulder reconstruction Multi-Directional Instability, bilateral shoulders Video

More symptomatic on operated right side.

1:02:19 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

1:03:07 Posterior Dislocation Image

1:03:36 EUA Severe Posterior Instability Video

1:04:52 ER view Images

1:05:04 Posteriorly dislocated & Stryker view

1:05:35 Shoulder Pain Algorithm:

AAOS Clinical Guideline on Shoulder Pain, in Orthopaedic Knowledge Update: Shoulder and Elbow 2 (AAOS, 2002), p. 448-455.

1:06:01 Imaging

- Plain films
- Make the diagnosis by history and physical and plain films
- Institute treatment
- Re-examine
- Then special Imaging Studies

1:06:49 Shoulder Pain Algorithm

- 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.

1:08:19 AP Internal View

1:08:28 Stryker Notch View

1:08:57 Outlet View

1:09:36 Outlet Upright View

1:10:01 Axillary Lateral View

1:10:18 Modified Axillary View in Humeral External Rotation

1:10:44 Subscapularis Muscle

1:11:19 Subscapularis Tears

- Lift Off (75% tear 5–30)
- Hand or back L spine
- 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

1:12:37 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 Greater than ER

1:13:07 Clinical exam: subscapularis tear Video

“I was unable to get my wallet out of my back pocket.”

1:14:30 Subscapularis & Biceps Instability Video

1:16:10 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

1:17:18 Pectoralis Major Rupture 33 YO Male Video

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

1:18:26 34 YO RHD weight-lifter Pain over AC joint s/p arthroscopy labral debridement 3 years previously Right AC osteolysis

1:19:45 Open distal clavicle resection

1:20:10 You May Not Have Seen It, But It Has Seen You

1:20:48 31 YO female Lawyer Shoulder pain; don't forget the coracoid

1:22:06 16 months later Continued impingement signs Remember the coracoid

1:22:58 Gr. 1 Chondrosarcoma, coracoid  
Get preop xrays; remember the coracoid!

1:23:14 12 YO Male Soccer Athlete

- Pain in left shoulder, 1 to 2 years
- No injury
- PE: normal stability
- Mildly tender firm axillary mass

1:24:47 Dx: Synovial Sarcoma

- Underwent limb salvage sarcoma resection and chemotherapy

1:25:13 22YO LHD Male

- Multiple osteochondroma
- Girlfriend noted scapular asymmetry

1:26:35 True space occupying mass

- Causing "winging" and "snapping"
- Axial skeleton osteochondroma
- Underwent resection mass
- Diagnosis: osteochondroma, no malignant change

1:26:52 CT Scan Mass Video

1:27:09 Make the Primary Diagnosis!

1:27:56 Shoulder Pain Algorithm (cont.)

1:28:07 Imaging

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

1:29:14 Ultrasonography

- In office
- Accurate
- Low cost

1:30:11 Ultrasound showing symptomatic progression of previously asymptomatic rotator cuff tear.



1:30:49 Differential Diagnosis Categories

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

1:31:39 Needs specialized care, refer to specialist

1:32:23 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.

1:33:22 CONCLUSIONS

"Sometimes an MRI report just doesn't help. . . "

1:34:11 Conclusions

- By:
- Knowing Anatomy
- Understanding Biomechanics
- Sport of injury
- Mechanism
- Physical Exam makes sense

and Specific Diagnosis is made

1:34:40 Little League pitchers do NOT become Big League pitchers

1:35:24 Try to put the whole picture together  
Treat the entire patient!

1:35:53 The End . . . Thank You!