

# **"Physical Examination and Differential Diagnosis for Shoulder Problems"**

경북의대 정형외과 인주철

- DDX : 1. Impingement syndrome**  
**2. Rotator cuff tear**  
**3. Biceps tendon problem**  
**4. Instability**

## **1. Impingement syndrome**

- Three progressive pathologic stages (by Neer)
  - stage 1 : edema and hemorrhage
  - stage 2 : thickening and fibrosis
  - stage 3 : rotator cuff tear, biceps rupture and bone changes
- Individual who excessively use their arm above the horizontal are especially at risk for developing impingement
- Functional arc of shoulder elevation is forward, with the greater tuberosity of humerus impinging against the anterior one third of the acromion undersurface.

### **1) Dx of stage 1.**

- **Hallmark** : reversible lesion
- **Age** : 10 to 20-year-old group
- **Symptoms**
  - . pain : dull ache about the shoulder following strenuous activity
  - . progress to discomfort during sport or activity -> interfering with sleeping
- **Physical findings**
  - ① palpable tenderness over the greater tuberosity at supraspinatus insertion
  - ② palpable tenderness along the ant. edge of the acromion
  - ③ a painful arc of abduction between 60 degrees and 120 degrees increased with resistance at 90 degrees
  - ④ positive impingement sign
  - ⑤ impingement test : 1% lidocaine injection into the subacromial space -> pain relief
  - ⑥ bicipital tenderness
  - ⑦ Speed's test : pain along the bicipital groove with resisted forward flexion and extended elbow with forearm supination
  - ⑧ Yergason's sign : pain with resisted supination at 90 degrees elbow flexion
  - ⑨ painful restricted range of motion.

### **2) Dx of stage 2**

- **Hallmark** : inability to reverse the process by activity modification and time
- **Age** : 25 to 40-year-old group
- **Symptoms** :
  - aching discomfort, often interfering with sleep and work

- **Physical finding**

physical finding of stage 1

- ① greater degree of soft-tissue crepitus, due to scarring in the subacromial space
- ② catching sensation with reversal of elevation at approximately 100 degrees, thought to present scar tissue entrapment beneath the acromion.
- ③ mild limitation to both passive and active range of motion.

3) **Dx of stage 3**

- **Hallmark** : prolonged history of refractory tendinitis, significant tendon degeneration
- **Age** : 40 to 50-year-old group
- **Symptoms** :

prolonged periods of pain, particularly at night weakness

- **Physical finding with rotator cuff degeneration**

- ① limitation of shoulder motion, active being more limited than passive
- ② infraspinatus atrophy
- ③ weakness of shoulder abduction and external rotation.
- ④ biceps tendon involvement with rupture or degenerative changes occurring in a high percentage of patients with rotator cuff tears.
- ⑤ acromio-clavicular joint tenderness, especially if degenerative changes are present

- **Radiographic evaluation**

1) **Plain X-ray**

- . early stage - normal
- . stage 3 or late stage 2
  - ① cystic changes about the greater tuberosity
  - ② sclerotic changes beneath the ant. third of the acromion
  - ③ osteophytes along the undersurface of the acromion, after associated with the coracoacromial ligament
  - ④ acromioclavicular joint change
  - ⑤ late narrowing of the subacromial space

2) **Arthrogram**

- : to identify rotator cuff tears diagnosed by extravasation of dye from the glenohumeral joint into the subacromial space
- . double contrast arthrogram with tomogram

3) **Bursagrams**

4) **Ultrasonogram**

5) **MRI**

**2. Biceps tendon problem**

- The synovial lining of biceps tendon is an extension of the synovium of the shoulder joint, and any inflammatory process within the synovium of the joint can extend along the tendon.

- Symptoms

- 1) Pain anteriorly radiating to the biceps muscle and ant.elbow,pain on internal rotation,and pain with forward flexion of the shoulder.
  - . worse with repetitive overhead activities or lifting
  - . relieved by rest
  - . more intense at night
- 2) pain in the groove ---> biceps subluxation
- 3) click or pop as the arm rotate

- Physical examination

- 1) The muscle of the rotator cuff, the spine of the scapula,the acromion,A-C joint, biceps groove ---> should be palpated carefully
- 2) Specific testing for impingement syndrome should be performed,because in 95% of patients, biceps tendinitis is secondary to a primary diagnosis of impingement.
- 3) Point tenderness in the biceps groove 3 to 6 cm below the ant.acromion with the arm approximately 10 degrees of internal rotation
- 4) Ludington's test or position :  
The patient places both hands behind the head and flexes the biceps.  
This is the best position to see subtle differences in the contour of the biceps and to pick up a biceps rupture.
- 5) Speed's test or the biceps tension test
- 6) Yergason's sign
- 7) Biceps instability test

- Diagnosis

- 1) Plain X-ray : A-P axillary view, supraspinatus outlet view,biceps groove view
- 2) Ultrasonogram
- 3) Single-contrast arthrography : absent or poor filling
- 4) MRI
- 5) Arthroscopy : synovitis,fraying

### 3. Rotator cuff tear

- Age : 5th decade of life or older

- Acute

Chronic : traumatic (longer than 3wks)  
          attritional (degenerative)

- most ruptures are chronic and attritional rather than traumatic

- Symptoms

: Insidious onset of pain,especially aggravated by use in the overhead position  
pain at night.

- **Physical findings**
  - 1) loss of motion is due to pain & slight
  - 2) drop arm test ( $\pm$ ),if present,massive defect in the rotator cuff
  - 3) tenderness about the cuff ( $\pm$ ) : frequently prominent and tender A-C joint
  - 4) crepitus with motion
  - 5) weakness in ext.rotation
  - 6) atrophy of deltoid and spinati ( $\pm$ )
  - 7) pain with palm-down abduction
  - 8) positive impingement sign
- **Radiographic diagnosis**
  - 1) Plain radiograph
    - . degenerative change at the A-C joint
    - . cystic change about the greater tuberosity
    - . elevation of the humeral head with relationship to the glenoid or a narrowed acromiohumeral interval
  - 2) Arthrogram : confirmed single-contrast arthrography
  - 3) MRI

#### **4. Anterior Shoulder Instability**

- Shoulder instability should be diagnosed by its frequency, the degree of trauma involved,its direction,and the degree of instability
- Voluntary dislocation
  - .pop-out without apprehension and with minimal discomfort
  - . commonly associated with generalized ligamentous laxity or connective tissue disorders such as Ehler-Danlos syndrome
  - . require psychiatric evaluation prior to surgery
- Shoulder subluxation
  - Def: Increased humeral head translation on the glenoid
- Clinical presentation
  - : one of pain
  - 1) Painful clicking or dead arm syndrome while in phase I of throwing (cock-up phase)
  - 2) Pain is often posterior,or the patient may present with a classical impingement syndrome from repetitive traction and compression of the rotator and compression of the rotator cuff during subluxation.
  - 3) Some loss of external rotation with the arms at the 90 degrees position secondary to apprehension.
  - 4) Degree of ext. rotation loss with the arm at the side (losses of 15 to 20 degrees).
  - 5) Crepitus
  - 6) Sulcus sign - multidirectional instability
  - 7) Any axillary nerve dysfunction

- Radiographic Dx  
"instability series"
- ① AP view in internal rotation
- ② Stryker Notch view
- ③ West point view

## 5. Post Shoulder Instability

- Differs in other way from ant. instability patterns
- Post subluxation do not progress to a recurrent dislocation pattern
- Majority of patient, with post.subluxation present initially with the complaint of pain,with instability as a secondary concern.
- Apprehension : uncommon
- Voluntary subluxation : 2 types
  - 1 S/L by appropriate positioning of their arm into flexion,adduction,and internal rotation
  - 2 selective muscle group activation and suppression to create the displacement of the humeral head --- generalized ligmentous laxity and hypoplstic glenoid and/or humerous.
- Involuntary subluxation  
high forces generated by the periscapular muscles developed in the follow-through phase of various sprots activities.
- Humerus in adduction,flexion,and internal rotation and maximal contractions are in the subscapularis and deltoid muscle groups.
- Pitchers,swimmers during pull-through phase of freestyle,tennis players with serving and with stress on the post.structures in back-hand stokes.
- Clinical findings
  - 1) Pain :
    - . post.,ant. or both
    - . stress-related inflammation in the rotator-cuff due to abnormal biomechanics resulting impingement syndrome
    - . more disabling than the subluxation itself.
  - 2) Crepitation and/or clicking (90%)
  - 3) Loss of internal rotation with flexion arm at 90 degrees of abduction
  - 4) Post stress testing : performed with the patient supine, in both 90 degrees of abduction and 90 degrees of forward flexion with adduction and internal rota
  - 5) Instability grade
    - 1+ : incresed motion without a "clunking"sensation of the humeral head "dropping off" the post.glenoid.
    - 2+ : if clunking is noted without locking in the subluxated position
    - 3+ : if there is actual locking in the subluxated postion
- Careful exam for multidirectional instability

- Careful assessment should be done for generalized ligamentous laxity
  - : Four parameters
    - ① degree of thumb hyperabduction in wrist palmar flexion
    - ② degree of index finger MP joint hyperextension in wrist palmar flexion
    - ③ degree of elbow hyperextension
    - ④ degree of knee hyperextension
  
- Radiographic evaluation
  - 1) "instability series"
    - + AP view in ext.rotation
  - 2) CT scan
  - 3) Arthrogram + CT scan
  - 4) MRI