

견관절의 이학적 검사 (Physical Examination in Shoulder)

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Basic principles

- Undress the patient to the nipple level
- Compare sides
- Check range of motion
- Do a neurovascular exam if needed

Inspection & Palpation

1. Winging
2. Shrugging
3. Muscle atrophy
4. Cervical/ Thoracic excessive lordosis,
Thoracic excessive kyphosis, scoliosis
5. SC joint
6. AC joint
7. Tuberosities
8. Coracoid process and conjoined tendon insertion
9. Biceps tendon: internal rotation 10° makes the tendon anterior to shoulder
10. Rent test: transdeltoid palpation of rotator cuff tear

Range of motion

Active and passive ROM

1. Forward flexion
2. Abduction

3. External rotation at abduction
4. Internal rotation at abduction
5. External rotation at side
6. Internal rotation at position

Manual muscle test

1. Supraspinatus muscle test

- a. Empty can test (Jobe's test)

Position: standing

Maneuver: resistive abduction, abducted 90°, horizontally flexed 20-30°, thumb down position

- b. Full can test

Position: standing

Maneuver: resistive abduction, abduction 90°, horizontally flexed 20-30°, 45° external rotation

2. External rotator muscle test

Position: standing or sitting

Maneuver: resistive external rotation arm at side, elbow in tight to thorax

Muscle weakness with or without pain is positive. Indicate, infraspinatus muscle weakness

3. Internal rotation

Resistive internal rotation, arm at side. Weakness of pectoralis and of s subscapularis, not specific for any one muscle

Provocative tests

Rotator Cuff Disorders

A. Subacromial impingement signs

1. Neer impingement sign (I)
2. Hawkins impingement sign (II)
3. Painful arc sign: pain or painful catching between 60 ° and 120 ° of abduction

B. Coracoid impingement

Coracoid impingement test

Position: standing or sitting

Maneuver: Relax arm, internally rotate and adduct

Positive test: aggravate shoulder pain or clicking

Interpretation: impingement of humeral head or supraspinatus tendon to coracoid process

C. Internal impingement test

1. Relocation test
2. Abduction 90 and maximal ER

D. Rotator cuff integrity tests

1. Supraspinatus tendon integrity

a. Drop arm sign

The patient was asked to elevate the arm fully and then to slowly reverse the motion same arc. If the arm dropped suddenly or the patient had severe pain, the test is considered to be positive.

2. Supraspinatus and infraspinatus tendon integrity

External rotation lag sign

The elbow flexion 90°, 20° elevation of shoulder in scapular plane with near maximal external rotation. The patient is asked to actively maintain the external rotation in elevation as the physician releases the wrist while maintaining support of the limb at the drop. It might be false positive in suprascapular nerve palsy

3. Infraspinatus tendon integrity

Drop sign

The patient's arm is held at 90° scapular plan elevation and full external rotation with 90° elbow flexion. The patient is asked to actively maintain this position as the physician releases the wrist while supporting the elbow. Positive if it shows lag or "drop". It is also false positive in suprascapular nerve palsy

4. Subscapularis tendon integrity

a. Lift off test

lift one's hand off one's back at full extended and internal rotated arm position, if one is unable to lift off, it is positive.

b. Belly press test

Press abdomen with maximal internal rotation, elbow drops back behind trunk

c. Napoleon sign

Belly press is exerted by extension of the shoulder and flexion of the wrist. This position is considered as the "Napoleon sign"

d. Internal rotation lag sign

The affected arm held by the physician at almost maximal internal rotation. The elbow is flexed to 90°, and the shoulder is held at 20° elevation and 20° extension. The dorsum of hand is passively lifted away from the lumbar until almost full internal rotation is reached. The patient is then asked to actively maintain this position as the physician releases the hand. If the patient can not maintain the position it is considered positive.

e. Belly-off sign

The affected arm of the patient is passively brought into flexion and maximum internal rotation with the elbow flexed to 90°. The elbow of the patient is supported by one hand of the examiner while the other hand places the palm on the abdomen. The patient is asked to keep the wrist straight and actively maintain while maintaining support at the elbow. The hand lifts off the abdomen is positive sign

5. Teres minor tendon integrity

a. Hornblower's sing

External rotation at 90° of abduction. The examiner supports the patient's arm at 90° of abduction in scapular plane. The elbow is then flexed to 90°. The patient is asked to rotate the forearm externally against the resistance of the examiner's hand. Positive test: the shoulder can not be externally rotated

*Combination of tests for diagnosing rotator cuff disease

Murrell et al

Three tests: supraspinatus weakness, weakness in external rotation, and impingement (Hawkins or Neer) Rotator cuff tear ; all three were positive, of if two tests were positive and the patient was aged 60 of older, the individual had 98% chance Rule out rotator cuff tear; absence of three tests

Park et al

The combination of the Hawkins impingement sign, the painful arc sign, and the infraspinatus muscle test yielded the best post-test probability (95%) for any degree of impingement syndrome. The combination of the painful arc sign, drop-arm sign, and

infraspinatus muscle test produced the best post-test probability (91%) for full-thickness rotator cuff tears.

Biceps Lesions and SLAP

Biceps tests

1. Speed's test

Arm flexed 90 degrees and 10 degrees horizontal abduction, then resisted elevation. Pain is elucidated during forward elevation on the groove. Biceps long head problem (tendonitis, subacromial impingement, SLAP)

2. Yergason's test

Resisted supination of elbow, and pain localized of the bicipital groove
Mainly, biceps tendon problem

3. Ludington's test

Position: sitting, clasps both hand top of behind of head, alternatively contracts and relax the biceps tendon. Impossible to feel biceps tendon, Rupture of biceps tendon

4. Biceps instability test

Palpation biceps in groove while taking the arm from an abducted external rotated position to a position of internal rotation. Palpable or audible painful click indicated positive test. Subluxation or dislocation of biceps tendon

SLAP tests

1. Compression rotation test (McMurray's of the shoulder)

Position: Supine or lateral position. Arm abducted 90 degrees and grind idea is to capture labral fragment. Pain or a click is positive test. Sensitive for labral tear, not specific for SLAP

2. Crank test

Arm elevated 160' in the scapular plane, humerus loaded axillary with maximum internal and external rotation. Glenoid labral tears, not specific for SLAP lesions

3. Active compression test (O'Brien test)

Arm forward flexed 90' with elbow extended, arm adducted 10 to 15', maximum internal rotation (thumb down position), examiner applies resisted downward force to arm, patient then maximally

supinates arm and the maneuver is repeated. Positive test: either a click or pain. Pain shoulder decrease with palm up. Interpretation: SLAP, AC arthritis

4. Biceps Load test II

Arm elevated 120°. Maximum external rotation, elbow flexed 90°, forearm supinated resisted elbow flexion. Pain during resisted elbow flexion is positive.

Negative test: no pain or pain unchanged or less by resisted elbow flexion

5. Pain provocation test or Mimon's test

Arm abducted approximately 90° to 100° examiner externally rotates shoulder and puts forearm in maximum pronation and then maximum supination. Positive test: pain provoked only when forearm is in pronated position. Or Pain in pronation is greater than pain in supination

Instability and Laxity

Laxity tests

1. Anterior and Posterior Drawer

A) Anterior drawer: One hands holds the patient's scapula firmly, other hand draws arm anteriorly, while the shoulder positioned 80° to 120° abduction, 0° to 20° forward flexion and 0° to 30° external rotation.

B) Posterior drawer: One hand holds arm 120° elbow flexion, shoulder 80° to 120° abduction, and 20° to 30° flexion initially. Thumb of other hand push humeral head posteriorly during arm holding hand rotates the arm medially and flexes it 60° to 80°

Grading systems: modified Hawkins scale

I: to the glenoid rim, but not over glenoid edge (or doesn't sublux)

II: goes over the rim but spontaneous reduction when the force was removed

III: locks out

2. Load and shift test

One hand holds scapula. Other hand holds proximal arm and reduces humeral head concentrically in glenoid fossa. Then shifts humeral head anteriorly and posteriorly. Grading system same as grading system of drawer test

3. Sulcus sign

Grasps the patient's forearm below the elbow and pulls the arm distally. Repeat with arm in external

rotation

Grading System:

I : less than 1.0 cm

II : 1.0~2.0 cm

III : over 2.0cm

A sign of inferior laxity, not inferior instability unless reproduces symptoms, not decreased with ER then supposedly rotator cuff interval lesions

4. Generalized laxity signs

Thumb to forearm

Finger MP hyperextension

Elbow hyperextension

Genu Recurvatum

Frequent ankle sprain

Instability tests

1. Anterior instability

A) Crank test

Abduction and external rotation push anteriorly on shoulder (fulcrum test)
apprehension is sign of positive

B) Relocation test

Press back on anterior shoulder after crank test to relieve the apprehension

2. Posterior instability tests

A) Posterior apprehension or stress test (Jerk test)

Arm flexed 90° at scapular plane, apply posterior force on elbow, pain or apprehension is positive sign

Initially 90° abduction and apply axial loading, then horizontal adduction return to initial 90° abduction position. Sudden jerk or clunk as the humeral head slides off and the back of glenoid

Scapular movements

Evaluation of Scapulothoracic Articulation

1. Scapular position and motion

Sick scapula syndrome

Scapular dyskinesis

2. Muscle strength

A) Scapular isometric pinch or Squeeze test

Maneuver: Actively "pinch" or retract the scapulae together

Positive test: burning pain occurs in less than 15sec

Interpretation: weakness of scapular retractors

B) Wall pushup test

Maneuver: arms length from wall, wall pushup 15 to 20 times

Positive test: scapular winging may be noted with 5 to 10 wall pushups

Interpretation: weakness of serratus anterior

C) Lateral scapular slide test

Position: standing or sitting. Measure the distance from inferior angle of the scapular spine to the closest spinous process in three different positions; 1) arms at side, 2) arms abducted, approximately 10° shoulder extension, hands on waist, thumbs back, 3) arms abducted to 90°, thumbs down position. Positive asymmetry more than 1.5 cm. Dysfunction of scapular stabilizer

3. Corrective tests

A) Scapular assistance test

Purpose: to evaluate scapular and acromial involvement in subacromial impingement. One hand stabilizing clavicle and scapula and holds scapular retracted. Other hand hold inferior angle of scapula, than, stabilizes and pushes the inferior medial border of the scapula up and laterally during the patient actively abducts or forward flexes the arm.

Elimination or modification of external impingement symptoms serratus anterior and or lower trapezius muscle weakness

B) Scapular retraction test

Maneuver: improvement in rotator cuff manual strength testing. Trapezius and Rhomboids muscle weakness

AC joint tests

1. Cross arm adduction stress tests (Horizontal adduction test)

Examiner passively forward flexes the arm 90° and then horizontally adducts the arm as far as

possible. Positive if localized pain on AC joint. AC joint lesion, or posterior joint capsule tightness is expected.

2. Acromioclavicular resisted extension test

- Please see SLAP
- Pain should localize on AC joint

Neurovascular examination

1. Peripheral nerves

- a. Musculocutaneous- biceps
- b. Radial- triceps
- c. Ulnar- intrinsic
- d. Median-opponens pollicis
- e. Axillary- deltoid
 - Swallow- tail sign
 - Deltoid extension lag sign

2. Vascular Examination

- a. Adson's maneuver
- b. Wright's maneuver
- c. Roos stress test
- d. Costoclavicular maneuver