ORTHOSPORTS NEWS

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Welcome to Orthosports News 2018.

In this newsletter Dr Doron Sher presents a complete Shoulder examination series for your reference including the most common shoulder conditions presenting in General Practice. We trust this edition will give you a helpful summary and outline of practical testing procedures.

– The Team at Orthosports

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AUSTRALIAN ORTHOPAEDIC ASSOCIATION

WHO ARE WE?

Orthosports is a professional association of Orthopaedic Surgeons based in Sydney.

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Shoulder pain **diagnosis**

Shoulder pain is common and can be difficult to diagnose accurately. It is helpful to remember that certain diagnoses are more common in certain age groups. Across the board impingement is by far the most common diagnosis but in the younger age groups (20-40) one should consider instability both as it's own diagnosis and as a cause for secondary impingement.

In the 30-50 year age group remember adhesive capsulitis (which unfortunately is over diagnosed) as well as impingement and rotator cuff tears; and in the 50+ age group add arthritis to the list above.

As with all joints a thorough history is required to appropriately direct your clinical examination. Ask about the patient's age, hand dominance, sport and work activities. Does the injury prevent or interfere with work, hobbies and sport? The location and nature of the pain, instability, stiffness, locking, catching and swelling are all critical questions. Pain from the shoulder is often felt in the upper arm and night pain is common.

Stiffness or loss of motion is seen with adhesive capsulitis, arthritis and posterior glenohumeral dislocation.

Pain or inability to throw suggests anterior glenohumeral instability. Pain at the top of the shoulder may be AC joint arthritis. A history of a fall, or pain with lifting, may indicate a rotator cuff tear and may be associated with bruising in the upper arm (which could also indicate a fracture).

Clinical examination requires inspection, palpation, evaluation of range of motion and provocative testing. Always remember to check the neck and elbow and look for neurological problems. Bones, muscles and soft tissue structures can all be injured around the shoulder.

The rotator cuff is made up of 4 muscles: the supraspinatus, infraspinatus, teres minor and subscapularis. Rotator cuff tears most commonly begin with the supraspinatus, resulting in weakness in external rotation. Subscapularis tears result in internal rotation weakness. The physical examination for a rotator cuff tear will serve to isolate out these muscles to test their function. A patient with an intact rotator cuff will be able to resist the examiner's force during strength testing. When a patient is unable to resist, weakness is noted.

Shoulder pain may originate from pathology in the neck. Pain is referred to the shoulder and can make diagnosis of the source of the pain difficult.

KEY EXAMINATION POINTS

INSPECTION

The shoulders and arms should be properly exposed to look for swelling, asymmetry, muscle atrophy, scars and bruising. Loss of shoulder roundness may be from a dislocation or chronic muscle wasting. Scapular winging and poor scapulothoracic rhythm can indicate a nerve injury or be the cause of secondary impingement. Look for rupture of the long head of biceps and any scarring. Wasting of the supraspinatus or infraspinatus makes you suspicious of a rotator cuff tear, suprascapular nerve entrapment or neuropathy.

PALPATION

Palpation should include examination of the acromioclavicular and sternoclavicular joints, the cervical spine and the biceps tendon. The glenohumeral joint, coracoid process, acromion and scapula should also be palpated for any tenderness and deformity. Feel the whole shoulder girdle and determine the tender points. In particular, tenderness of the joint lines, anterior and/or posterior, often occur in instability.

RANGE-OF-MOTION TESTING

Always compare the two shoulders with both active and passive range of motion. Forward elevation (Image 1), external rotation (Image 4) and internal rotation (Image 2) and abduction are the most useful movements. Loss of some motion can be caused by impingement, calcific tendonitis and chronic instability. A global loss of motion is caused by arthritis, chronic dislocations, fractures and massive rotator cuff tears.

Image 1: Forward elevation

Image 2: Internal rotation

Testing Active and Passive motion helps to differentiate a rotator cuff tear from adhesive capsulitis or glenohumeral arthritis.

- PASSIVE motion of the shoulder is generally maintained with a rotator cuff tear and restricted in the other entities.
- ACTIVE motion will be limited as the torn rotator cuff limits the patient's ability to move the shoulder in all ranges of motion. If the problem has been present for some time secondary stiffness can occur.

STRENGTH TESTING

When examining the rotator cuff always test both arms and look for subtle (or obvious) differences in strength and motion. True weakness should be distinguished from weakness that is due to pain (a subacromial injection can be used to differentiate between the two). A patient with a rotator cuff tear may have weakness in one direction only with the rest of the rotator cuff examination being normal.

The supraspinatus can be tested by having the patient abduct the shoulders to 90 degrees in forward flexion with the thumbs pointing downward. The patient then attempts to elevate the arms against examiner resistance. This is often referred to as the "empty can" test. (Image 3)

Image 3: Empty can test

Next, with the patient's arms at the sides, the patient flexes both elbows to 90 degrees while the examiner provides resistance against external rotation.

Weakness of external rotation almost always indicates a rotator cuff tear.

Image 4: External rotation

Subscapularis function is assessed with the lift-off test. The patient rests the dorsum of the hand on the back in the lumbar area. Inability to move the hand off the back by further internal rotation of the arm suggests injury to the subscapularis muscle. A modified version of the lift-off test (Image 6) is useful in a patient who cannot place the hand behind the back. In this version, the patient places the hand of the affected arm on the abdomen and resists the examiner's attempts to externally rotate the arm.

Impingement tests known as the NEER and HAWKINS sign are used to demonstrate pain which comes from the subacromial space. These help to diagnose impingement, calcific tendinitis and rotator cuff tears (they can be positive with an intact or torn rotator cuff).

NEER SIGN – The elbow is kept straight and the shoulder slightly externally rotated. The shoulder is then forward flexed to take the hand above the head. Pain occurs at the acromion with a positive sign.

HAWKINS SIGN – With the shoulder forward flexed to 90 degrees the arm is slightly adducted across the body. The elbow is also flexed to 90 degrees and the arm is internally rotated. A positive test produces pain near the acromion. (Image 5)

Image 5: Hawkins sign

DROP ARM TEST – With a very large tear, the patient may lose the ability to hold the weight of the the arm against gravity. When the arm is above shoulder height the deltoid is the main muscle working and the patient can keep their arm in place. As they lower the arm, the deltoid is no longer the main muscle working and the rotator cuff should take over control of the arm. The patient is asked to slowly lower their arms to the side from 90 degrees of forward elevation. With a large rotator cuff tear the patient will have trouble controlling the arm and it will quickly drop down to their side - the drop arm test is positive.

HORNBLOWER'S SIGN – This specific test demonstrates a very large rotator cuff tear. The arm is adducted to 90 degrees and the elbow flexed. The patient is unable to keep the arm externally rotated, and it falls forward in a position that someone blowing a horn would be in to hold their instrument. This test isolates infraspinatus, which is the main driver of external rotation. A positive test confirms a massive tear and signficant loss of function of the rotator cuff.

SUBSCAPULARIS TEARS – These tears result in loss of internal rotation strength and should be looked for as they can occur in isolation.

SHOULDER INSTABILITY

Determining the mechanism of injury and the position of the arm when the patient feels their shoulder slip out of joint is very important.

Image 6: Lift off test

Specifically, if the arm is in abduction and external rotation when the patient has the sensation of instability, the instability then is in an anterior direction.

If the arm is adducted and internally rotated the instability is posterior.

Apart from a frank dislocation or subluxation the patient may have a subtle instability and complain of "the arm going dead" with forced abduction and external rotation of the arm such as when going into a tackle, throwing or serving at tennis.

Patients who are hypermobile or have generalised ligamentous laxity are more prone to have instability than others.

EXAMINATION:

Examine the patient elevating the arms in forward flexion from both the back and the front. (Image 7) Observe any abnormality of rhythm and compare the injured to the non injured side. Specifically observe the movement from behind and watch the scapula move comparing one side to the other. Although uncommon if the scapula wings as the patient brings the arm down one should suspect a scapula dysrhythmia, as a potential cause of the problem. Check the patient has a full range of motion.

Image 7: Scapula motion and control

The apprehension sign (Image 8) is designed to determine whether the shoulder is unstable. The aim is to put the shoulder in the provocative position for the dislocation and reproduce the patient's symptoms without actually dislocating the shoulder. For an anterior dislocation the shoulder should be put in abduction and external rotation, and for a posterior instability the direction of force should be adduction and internal rotation. This test can generally be done with the patient sitting on an examination couch but in the larger patient it is often easier to have the patient in the supine position.

Image 8: Anterior Apprehension sign

If you suspect instability then plain xrays are required to exclude fractures of the glenoid in particular (the so called bony Bankart lesion) or glenoid dysplasia. Ultrasounds are of little value. If surgery is contemplated the patient requires an MRI with intraarticular contrast. An MRI without contrast is not as helpful.

Injections can be used for diagnosis and treatment. If a subacromial injection relieves pain and restores motion and strength the patient usually has impingment rather than a rotator cuff tear. AC joint injections are useful to deal with superior shoulder pain.

Once the shoulder has been examined it is worthwhile examining the neck.

The patient is asked to extend the neck and tilt from side to side. This is known as the Spurling manouevre. This movement puts pressure on the nerves exiting the neck and will reproduce the pain if the problem is in the neck rather than the shoulder.

Image 9: Check for ligamentous laxity

Lastly check for ligamentous laxity (Image 9).

CONCLUSION

Combining a thorough history and careful examination will provide the diagnosis in the majority of cases. Imaging will confirm this diagnosis for you. Always start with a plain X-ray and in most cases an MRI arthrogram will be more useful than a plain MRI of the shoulder for surgical planning.

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