Common sports injuries. Part 2: testing the shoulder

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Injuries to the shoulder are common in contact sports, especially football codes. In addition to acute injuries, chronic shoulder pain and discomfort may present in athletes, particularly throwing athletes and swimmers. Physical tests can be helpful in diagnosing certain shoulder injuries.

In the previous issue, part 1 of this two-part series discussed general principles in assessing sports injuries and featured tests for the knee and ankle. Here, part 2 will consider some of the clinical examination techniques used for the diagnosis of specific shoulder injuries.

Impingement

Impingement of the rotator cuff mechanism beneath the acromion and acromioclavicular arch is recognised as a common cause of shoulder pain. Difficulties in establishing a gold standard or even a consistent definition for this diagnosis mean that the accuracy of tests for impingement is not known.

A commonly applied test involves abducting the shoulder to 90º in external rotation and then internally rotating the shoulder (Figure 1). This is thought to rotate the greater tuberosity of the humerus and the rotator cuff tendons underneath the acromial arch. Reproduction of the patient's pain constitutes a positive test result.

Anterior instability

Shoulder instability is poorly defined, yet generally taken to mean that there is excessive laxity of the shoulder joint that manifests as pain or tendency to ready dislocation. Excessive laxity is important to recognise because, if neglected, it can lead to irreversible degenerative change at the glenohumeral joint. Several types of instability are recognised – the most common being anterior instability, where the shoulder dislocates anteriorly.

Translating the humerus

Anterior instability can be assessed by grasping the upper humerus from behind the patient and attempting to translate it anteriorly over the lip of the anterior glenoid (Figure 2). Pain or excessive movement (when compared with the other side) constitutes a positive test result. The accuracy and reliability of this technique are not known.

The apprehension test

The apprehension test is performed by having the patient abduct the arm to 90º in external rotation. The examiner then applies anterior pressure to the back of the humeral head with one hand and slowly extends the patient's arm with the other (Figure 3). This forces the humeral

Figure 1. Assessing for impingement in the shoulder by internally rotating the abducted arm.

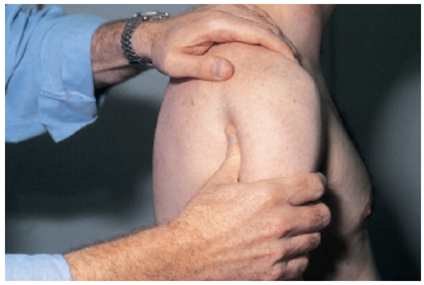

Figure 2. Testing for anterior laxity at the glenohumeral joint by attempting to translate the humerus anteriorly.

Figure 3. Shoulder apprehension test for anterior shoulder instability. The shoulder is abducted to 90º, externally rotated to 90º and then held in extension by the examiner while the examiner pulls forwards on the back of the humerus.

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Figures 4a and b. Anterior release test for anterior shoulder instability. A posterior force is applied to the humeral head while the arm is in 90° of abduction. a (left). The shoulder is then brought into maximal external rotation. b (right). The posterior force on the humeral head is then released.

head anteriorly relative to the glenoid fossa. The patient is asked to note any unusual or troubling sensations. A sense of concern (apprehension) that the shoulder is about to 'pop out of joint' and guarding by the patient indicates a positive test result. This test has been found to have a sensitivity of 74% for anterior instability.[1]

Anterior release test

Another test of anterior shoulder instability is the anterior release test (Figures 4a and b). This has been reported as having a sensitivity of 92% and a specificity of 89%.[2]

The test is performed with the patient supine and the affected shoulder over the edge of the bed. The arm is abducted to 90° while the examiner places a posteriorly directed force on the patient's humerus. The posterior force is maintained while the patient's arm is brought into extreme external rotation (Figure 4a). The pressure on the humerus is then relaxed (Figure 4b). The result is positive if the patient experiences a sudden pain and/or distinct increase in pain, or if the symptoms are reproduced.

Bicipital tendinitis

Inflammation of the long head of the biceps can cause anterior shoulder pain. It is possible to test for bicipital tendinitis by applying Speed's test.

The patient extends the elbow and supinates the forearm to bring the palm upwards. The shoulder is then flexed to 90°, and further flexion is resisted by the examiner (Figure 5). The reproduction of pain is indicative of bicipital tendinitis.

This technique has been found to have a sensitivity of 90% and a specificity of 18%.[3] In other words, a negative Speed's test means that a patient has only a 10% chance of having long head of biceps tendinitis.

Labral tears and acromioclavicular disorders

Tears to the glenoid labrum can contribute to, or be produced by, shoulder instability. They often require surgical repair. The active compression test is a new test reported to be highly specific and sensitive for the detection of labral tears and acromioclavicular disorders.[4]

The patient flexes his or her arm to 90° with the elbow fully extended. The

Figure 5. Speed's test for bicipital tendinitis. With the shoulder flexed to 90°, the elbow is extended and forearm supinated to bring the palm upwards. The examiner resists further flexion of the elbow and shoulder.

Figures 6a and b. Testing for labral tears and acromioclavicular pain. Pain brought on by resisted downward pressure in the first position (a, left) should be decreased by the same manoeuvre in the second position (b, right). Note the shoulder is at 90° flexion and at 15° across the body.

Figures 7a, b and c. Techniques for isolating the rotator cuff muscles for strength testing. a (above left). Supraspinatus. The arm is abducted to the horizontal, at 45° to the frontal plane, with the hand held as if holding a full can. The examiner resists further abduction. b (above centre). Infraspinatus. There is no shoulder abduction, and the arm is internally rotated to 45°. The examiner assesses the strength of external rotation from this position. c (above right). Subscapularis. The patient's hand is placed behind the back with the dorsum of the hand against the L3 vertebra. The examiner resists the patient's attempts to push the palm posteriorly.

arm is then adducted to 10° to 15° across the body with the thumb pointing down, which internally rotates the shoulder. The examiner, standing behind the patient, applies a uniform downward force to the patient's arm. Pain reproduction constitutes the first component of a positive test result (Figure 6a). The manoeuvre is then repeated with the arm fully supinated (i.e. palm up) to achieve external rotation, and in a positive test there is elimination or a decrease in the pain brought on by the first manoeuvre (Figure 6b).

Deep pain or painful clicking identifies a labral lesion, and superficial pain at the top of the shoulder suggests a painful acromioclavicular joint. The reported sensitivity of this test was 100% with 99% specificity for labral tears, and 100% sensitivity and 97% specificity for acromioclavicular joint pain.

Testing rotator cuff muscle power

Careful electromyographic studies have revealed the optimal position for testing the strength of each of the rotator cuff muscles.[5]

Supraspinatus strength is best tested at 90° of abduction in the plane of the scapular with the humerus externally rotated through 45° – this is best achieved through positioning the arm as if holding a full can. The examiner resists further abduction to test the strength (Figure 7a).

The infraspinatus is best isolated with no shoulder abduction and the humerus internally rotated through 45° (Figure 7b). The examiner then tests the ability of the patient to externally rotate the arm.

The subscapularis is assessed by asking the patient to push backwards against the examiner's hand from behind the L3 vertebra (the Gerber 'push off' test; Figure 7c).

Conclusion

When examining the shoulder for both acute and chronic injuries in athletes, there are a number of useful physical tests that can be used to aid in diagnosing the injury. Understanding their sensitivity and specificity enables these test to be interpeted correctly. This facilitates correct diagnosis and subsequent management. MT

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