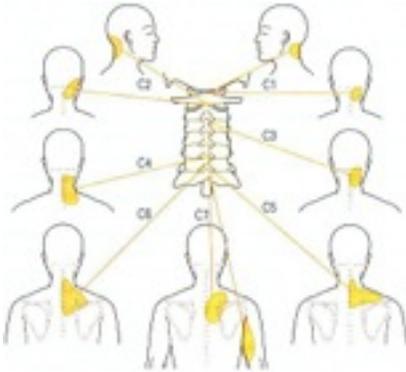


Shoulder Pain



Shoulder motion involves these articulations: the glenohumeral, acromioclavicular, and scapulothoracic. Stability of the shoulder is provided by ligaments and the rotator cuff muscles.

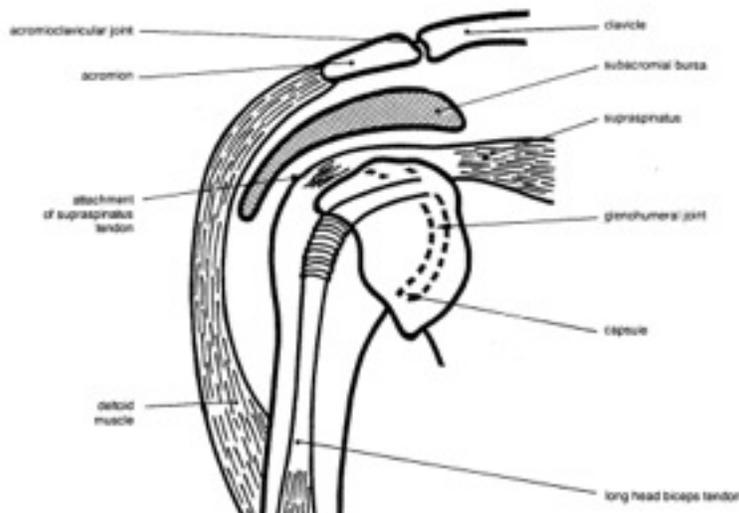
It has to be determined whether the disorder causing pain arises from within the shoulder structures or from other sources such as the cervical spine, the acromioclavicular joint or diseased organs, especially heart, lungs and subdiaphragmatic structures.



Virtually all shoulder structures are innervated by the 5th cervical nerve root.

Pain present in the C5 distribution can arise from:

- Cervical spine
- Upper roots of brachial plexus
- Glenohumeral joint
- Rotator cuff tendons, especially supraspinatus
- Biceps tendon
- Soft tissue, e.g., polymyalgia rheumatica
- Viscera, especially those innervated by the phrenic nerve (C3, 4, 5).

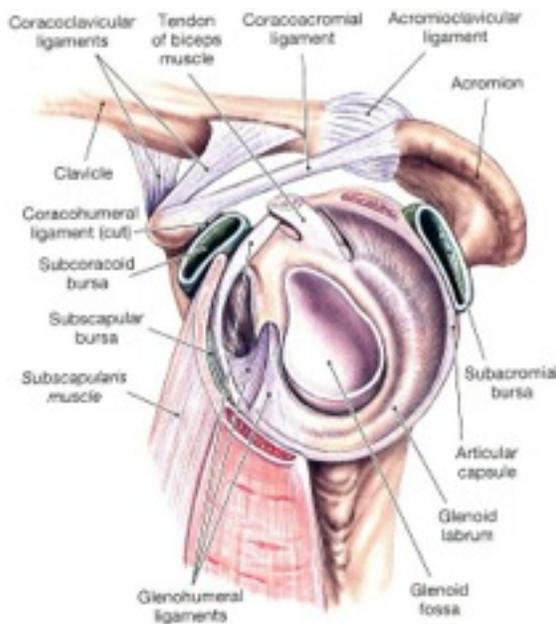


The visceral diseases causing a painful shoulder include:

- Cardiac disorders such as angina and pericarditis

- Lung diseases, especially Pancoast's tumor
- Mediastinal disorders
- Diaphragmatic irritation, as from intra-abdominal bleeding or subphrenic abscess.

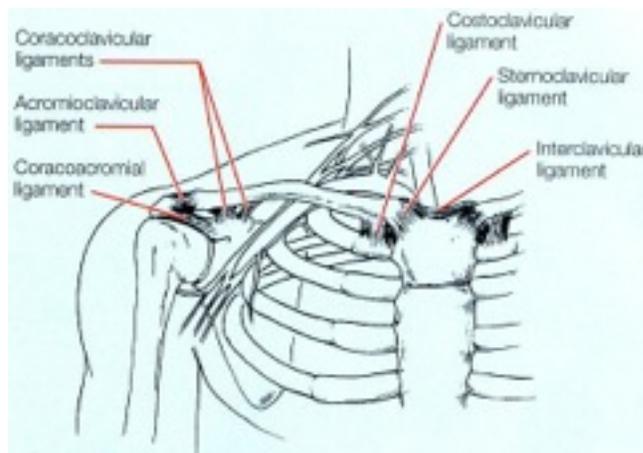
A careful history should generally indicate whether the neck or shoulder is responsible for the patient's pain. By the age of 50 about 25% of people have some wear and tear of the rotator cuff, making it more injury prone. Disorders of the rotator cuff are common, especially supraspinatus tendinitis. The most effective tests to diagnose these problems are the resisted movement tests.



The glenohumeral joint is a ball and socket joint enveloped by a loose capsule. It is prone to injury from traumatic forces and can develop osteoarthritis. The glenoid labrum is a rim of fibrocartilage at the periphery of the glenoid, which effectively deepens the glenoid fossa and increases its diameter and contact with the humeral head, thereby affording some increased stability.

The clinically important subacromial space lies above the glenohumeral joint between the head of the humerus and an arch formed by the bony acromion, the thick coracoacromial ligament and the coracoid process. This relatively

tight compartment houses the subacromial bursa and the rotator cuff, particularly the vulnerable supraspinatus tendon.



History

A fall onto can give rise younger pa-

the outstretched arm to instability in the patient or a rotator cuff

tear in the elderly. A fall onto the point of the shoulder may result in injury to the rotator cuff or acromioclavicular joint. Throwing injuries tend to stress the capsule and ligaments of the glenohumeral joint and can also give rise to rotator cuff or bicipital tendinitis.

Pain referred from the cervical spine is often maximal over the suprascapular region with associated paresthesia or pain referred into the upper limb. Acromioclavicular and sternoclavicular pain is usually well localized to the involved joint. Pain from rotator cuff pathology is usually felt at the outer aspect of the upper arm or deltoid region. Adhesive capsulitis tends to give rise to an intense aching deep in the shoulder although features similar to rotator cuff pathology are common in the early stages. Radiating pain into the arm may indicate cervical pathology, thoracic outlet syndrome, compressive neuropathy, brachial neuritis or reflex sympathetic dystrophy. Night pain tends to be of two types: either sharp pain associated with movement, indicative of a rotator cuff tendinitis or acromioclavicular pathology; or pain of a deep, constant aching nature more suggestive of capsulitis or a chronic tear of the rotator cuff.

Physical Examination

Observe the shape and contour of the shoulder joints and compare both sides. Note the posture and position of the neck and scapulae.



Scapular winging



Septic arthritis



Supraspinatus atrophy

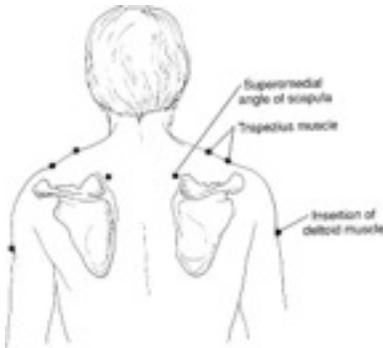


Sulcus defect due to instability

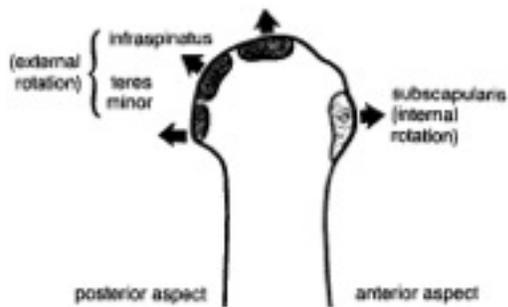


Rupture biceps tendon





Palpate for tenderness, swelling and instability of the acromioclavicular, sternoclavicular and glenohumeral joints. Tenderness over the long head of biceps and the bicipital groove is common in bicipital tendinitis but comparison with the normal shoulder is necessary as this tendon is normally tender to touch. Muscles of the shoulder girdle and neck region should be palpated for trigger points.



There may be tenderness over the rotator cuff insertions to the greater and lesser tuberosities, but this is not always present in rotator cuff tendinitis.

Movements of the shoulder joint are complex and involve the scapulothoracic joint as well as the glenohumeral joint, with each joint accounting for about half the total range. Flexion, abduction, external rotation and internal rotation should be tested. For each movement note the range of movement, any pain production, any trick movement by the patient, and scapulothoracic rotation.



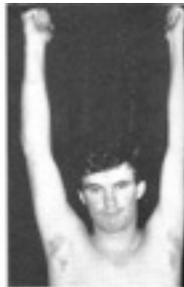
Active abduction



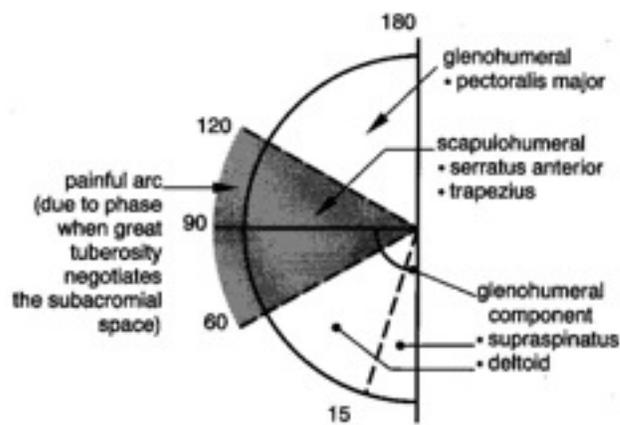
Active external rotation



Active flexion



Active internal rotation



Abduction is only possible if the arm is fully externally rotated. It is a key combined glenohumeral and scapulothoracic movement, which should reach 180 degrees. Look for the presence of a painful arc, which occurs between 60-120 degrees of abduction. The most common cause is supraspinatus tendinitis. Other causes include infraspinatus tendinitis and subacromial bursitis.

Glenohumeral joint pathology is unlikely in the presence of a normal range of passive motion.

Resisted shoulder movements are performed to assess involvement of muscles and tendons.



Resisted adduction - pectoralis major tendon and to a lesser degree the latissimus dorsi tendon affected.



Resisted external rotation - infraspinatus tendon and to a lesser degree the biceps tendon affected.



Resisted internal rotation - subscapularis tendon and to a lesser degree the teres minor tendon affected.

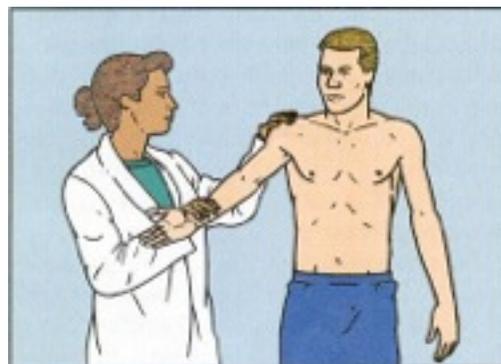


Emptying the can position test for the supraspinatus tendon in resisted abduction.

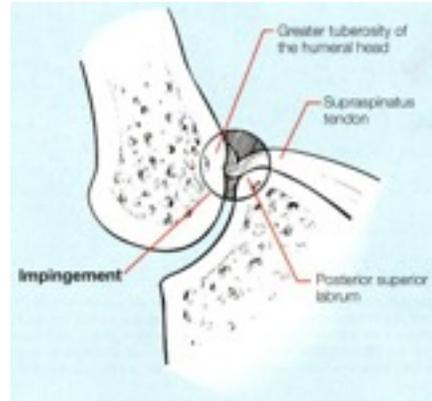
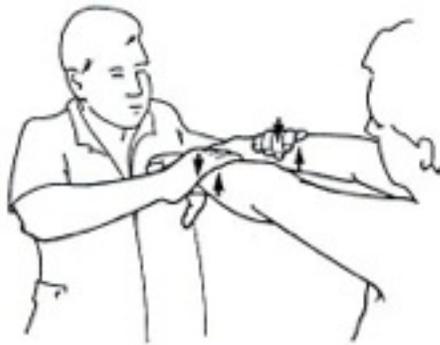


A quick test to differentiate between a lesion of the supraspinatus tendon and the infraspinatus causing a painful arc syndrome is the thumbs/up down abduction test. To test supraspinatus, perform abduction with thumbs pointing upwards, then with the thumbs pointing downwards to test infraspinatus.

To test the long head of biceps tendon is to oppose forward elevation of the arm with the elbow straight. A positive test is reproduction of pain in the bicipital groove. Resisted supination can also be used to test the tendon.



The impingement test is an effective test for supraspinatus lesions as it forces impingement of the greater tuberosity under the acromion. If pain is reproduced, this is a positive impingement sign and is a very sensitive test for the upper components of the rotator cuff, especially supraspinatus.

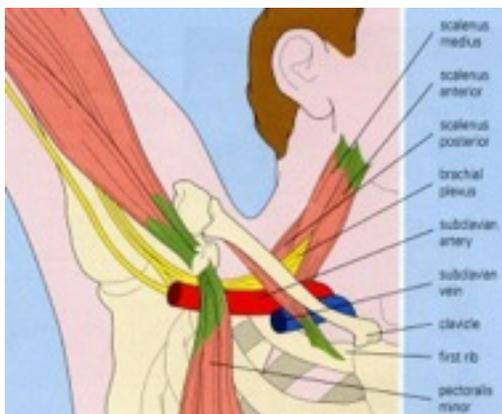


Pain at the acromioclavicular joint can be localized by performing various stress tests.

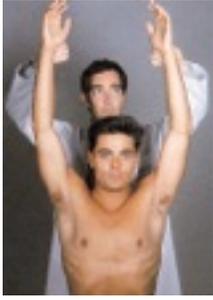
In one the arm is held with the elbow and shoulder extended and then passively adducted across behind the back. Pain is felt over an inflamed acromioclavicular joint at the limits of movement.



Palpation of the acromioclavicular joint



Assessment for a thoracic outlet syndrome can be done using several maneuvers, which may provoke the symptoms of neurovascular compression.

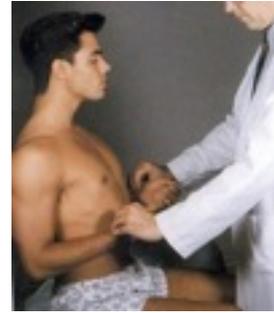


Hyper-
tion test



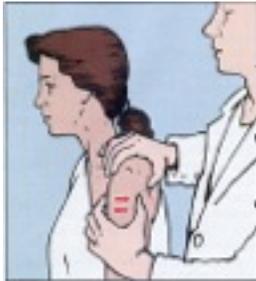
Hyper-

Adson test



abduc-

Costoclavicular test



The patient should be assessed for the presence of joint hypermobility. Laxity of the glenohumeral joint in anterior and posterior directions is determined by the drawer tests in which the humeral head is gripped firmly and moved backwards and forwards in the glenoid fossa.

Inferior laxity is assessed by applying distal retraction to the arm while palpating the gap between the humeral head and acromion. Presence of a distinct gap can be felt and seen and is referred to as a positive sulcus sign. If this is present it is indicative of multidirectional laxity of the joint.

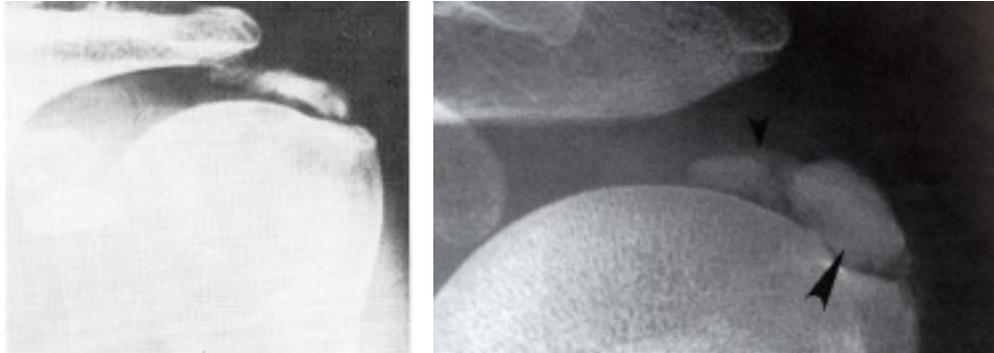


Supraspinatus Tendinitis

This is the commonest inflammatory problem encountered around the shoulder joint and can vary in intensity from mild to severe. The severe cases usually involve calcification (calcific tendinitis) of the tendon and spread to the subacromial bursa. On examination the following is found:

- Painful resisted abduction
- Painful arc
- Painful resisted external rotation

- Positive impingement test
- Positive emptying the can sign



Calcific tendinitis of the supraspinatus tendon

Subacromial Bursitis



This is sometimes called subdeltoid bursitis. On examination the following are noted:

- Global loss of shoulder motion
- Difficult to dress and undress
- Marked tenderness below acromion over deltoid

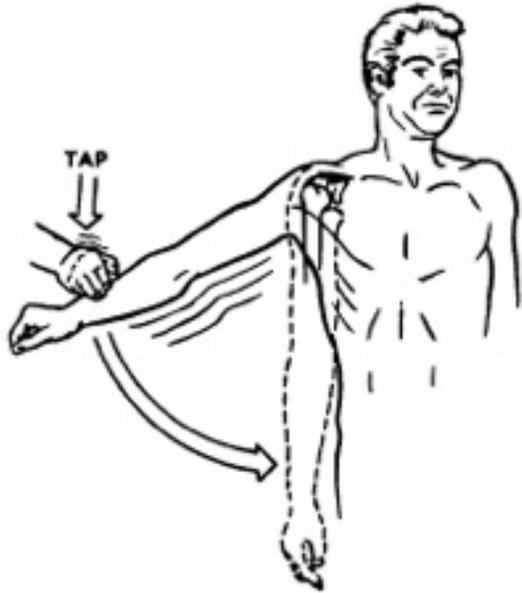
Rotator Cuff Tears

Tears may be acute or chronic, partial or full thickness. Partial tears may occur in any age group following trauma, but the full thickness (or complete) tear is rarely seen in the patient under 40 years of age.

Chronic full thickness tears may have no history of trauma and symptoms frequently become apparent with increased activity. The usual picture is one of pain on abduction and flexion with varying degrees of loss of active movement depending on the size of the tear. The patient may complain of weakness on abduction, flexion and internal or external rotation depending on the tendon involved. Night pain is common and often severe.

Examination reveals many of the features of rotator cuff tendinitis but there is often an inability to maintain the arm in abduction when lowering from the elevated position, i.e., a positive drop-arm sign. Subacromial crepitus and pain on impingement testing are present. A common clinical finding is wasting of the infra-

spinatus muscle, and to a lesser supraspinatus, with weakness of abduction, but more often weakness of external rotation reflects the size of the tear. Rupture of the long head of the biceps tendon is frequently associated with chronic rotator cuff tear.

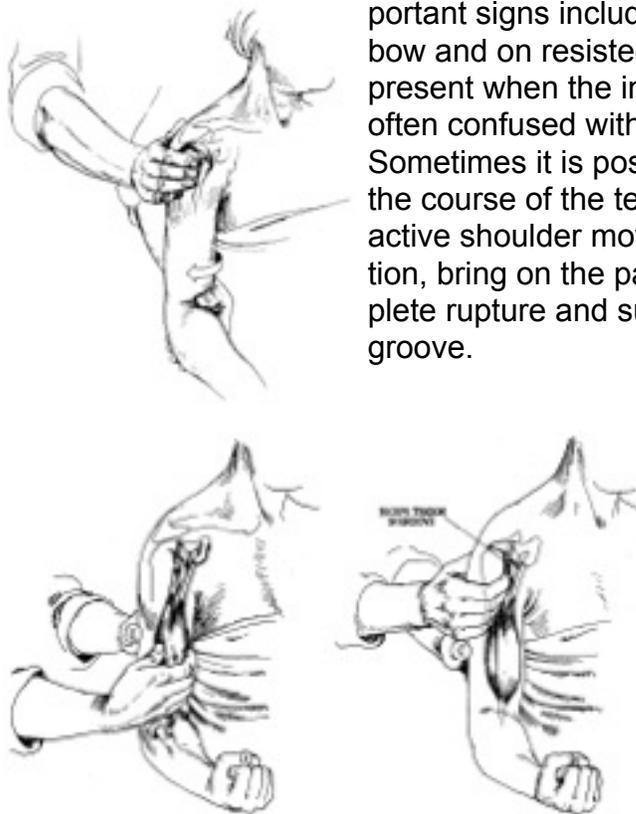


Abduction in a large cuff tear

Drop Arm Test

Bicipital Tendinitis

This is a tenosynovitis of the long head of biceps. Important signs include pain on resisted flexion of the elbow and on resisted supination. A painful arc may be present when the intrascapular part is affected. It is often confused with one of the rotator cuff lesions. Sometimes it is possible to elicit local tenderness along the course of the tendon in the bicipital groove. Most active shoulder movements, especially external rotation, bring on the pain. Two complications are complete rupture and subluxation of the tendon out of its groove.



Capsulitis

This is a condition of the shoulder that is difficult to define and to manage. Many labels have been given to the situation where there is a painful restriction of shoulder movement apparently of soft tissue origin. These include:

- Frozen shoulder
- Periarthritis
- Pericapsulitis
- Adhesive capsulitis
- Adherent or obliterative bursitis

Primary capsulitis of the shoulder can be defined as a condition of unknown etiology in which there is painful global restriction of glenohumeral movement in all planes, both active and passive, in the absence of joint degeneration sufficient to explain this restriction. Underlying diseases associated with this condition are:

- Diabetes mellitus
- Thyroid disease
- Pulmonary disorders such as tuberculosis and carcinoma
- Cardiac disease
- Surgery

Myocardial infarct, cerebrovascular accident or shoulder trauma may precipitate the development of shoulder capsulitis.

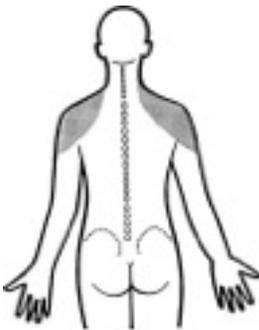
Onset under the age of 40 years is rare, with the mean age of onset being in the sixth decade. There are three phases in its development and progression:

1. Painful phase - insidious onset of symptoms usually in the form of shoulder pain on movement and background ache in the shoulder region, often in the upper trapezius muscle. There is increasing pain at rest and at night. Towards the end of this phase stiffness becomes a major complaint.
2. Adhesive phase - usually after several months the character of pain alters and becomes less severe. There is a reduction of pain at rest and at night but discomfort and a more severe pain at the limits of movement persist. Shoulder movement becomes more restricted during this phase.
3. Resolution phase - the pain is less evident and the dominant symptom is restriction of shoulder movement. There is a slow and gradual improvement in range of motion. The onset and rate of recovery are variable and unpredictable.



Differentiation from chronic rotator cuff tendinitis is possible on the basis of there being a global restriction of passive movement rather than simply the loss of abduction and flexion. Associated findings are tenderness in the upper trapezius muscle and early movement of the scapula. In the latter phases the important finding is significant restriction of glenohumeral movement with a compensatory increase in scapulothoracic motion during abduction and flexion.

Polymyalgia Rheumatica



It is very important not to misdiagnose this condition in the older person presenting with bilateral pain and stiffness in the shoulder girdle. It may or may not be associated with hip girdle pain. The patients seem to complain bitterly about their pain and seem flat and miserable. The pain is described as a deep intense ache that is constant but easier in the afternoon and evening. Patient will wake with pain at its greatest intensity. There is severe morning stiffness with malaise. There is usually a greatly elevated ESR. Corticosteroids are curative.

Acromioclavicular Osteoarthritis

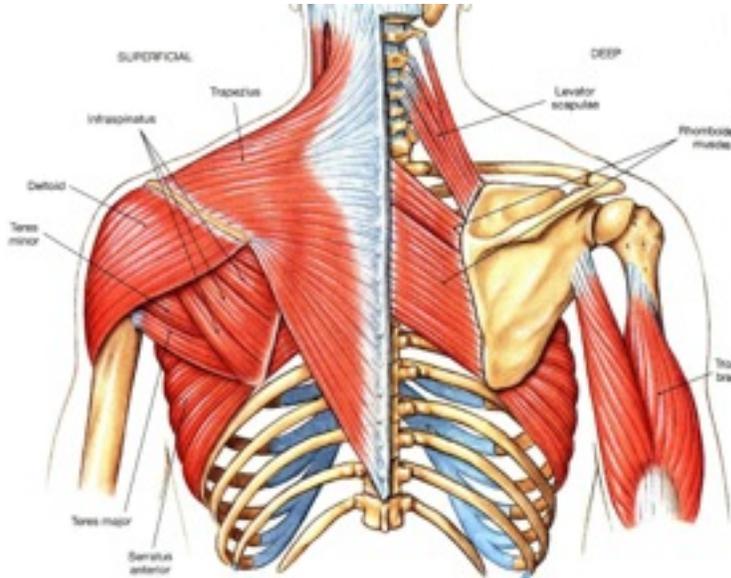


This condition is usually traumatic or degenerative and is relatively common in carpenters and sports people, especially rowers. Pain and tenderness is well localized to the joint, which is often prominent due to osteophyte formation. Pain exists of full abduction or horizontal adduction and can also be reproduced with adduction of the extended arm. Crepitus is frequently localized to the joint.

Scapulothoracic Bursitis



Scapulothoracic crepitus should not always be considered a pathologic symptom since it is found in up to 70% of the normal population. Rarely, it may represent changes in the bony structure of the deep surface of the scapula or underlying ribs, such as an osteochondroma of the scapula or a rib exostosis. These lesions tend to give a more pronounced snapping sound and may result in deviation of the scapula away from the chest wall.



Soft tissue causes are more common, and frequently a diagnosis of scapulothoracic bursitis is made, although the exact pathology is difficult to define. Crepitus is frequently found in association with muscular complaints, such as myofascial pain syndrome, and probably represents a frictional sound as the scapula glides across the underlying muscle layers.

Glenohumeral Instability

Symptomatic subluxation or instability often presents as a painful shoulder with all the signs and features of a rotator cuff or bicipital tendinitis, but a careful history and examination coupled with a high index of suspicion in the young adult should confirm the presence of instability.

Management of tendinitis in the young patient with instability should be directed at resolution of the symptoms, restoration of normal flexibility and scapular control, correction of faulty technique in athletes and then a suitable strengthening program for the dynamic stabilizers of the shoulder joint, notably the rotator cuff muscles. Also, correction of any muscle imbalance about the shoulder girdle is important. These methods are covered in the advanced seminar.

MyoFascial Disruption Treatment Approach to Shoulder Pain

If the patient presents with acute shoulder pain and global loss of motion (restriction in abduction, internal rotation, and external rotation) rule out fracture and dislocation.



With shoulder pain and decreased abduction, this usually means a herniated trigger point in the upper trapezius muscle and myofascial bands of the anterior and posterior shoulder.



Acute shoulder pain and decreased internal rotation is also usually due to an upper trapezius herniated trigger point and myofascial bands.



Acute shoulder pain and decreased external rotation is usually due to enthesopathy or myofascial bands.

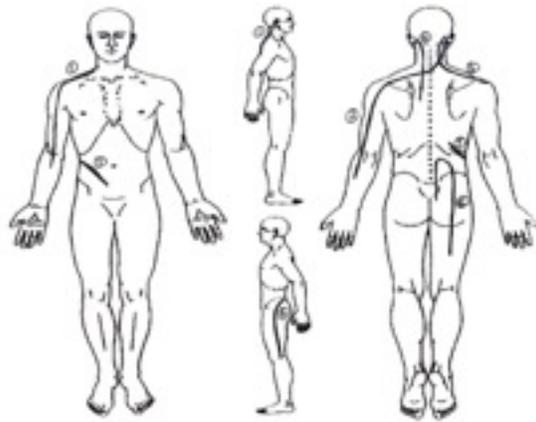
If the patient has shoulder pain and normal range of motion, the problem is usually due to myofascial layer disruption type of joint dysfunction (usually traction manipulation), or superficial fascial disruption of the upper arm.

When the patient is unable to abduct the shoulder without forward flexion, this indicates a synovial joint disruption type of joint dysfunction. If the patient is unable to have shoulder contact with the table, in the prone position with the involved arm above the head, this also suggests a synovial fixation of the glenohumeral joint. The patient will state the shoulder feels stiff, or the joint feels dry or needs to be lubricated. In severely restricted shoulders a slow mobilizing pump of the joint may have to be conducted before attempting manipulation.



With myofascial layer disruption type of joint dysfunction requiring compression of traction manipulation, the patient will rub the fingers across the humeral neck. The patient may also squeeze the shoulder joint. If the patient complains of a deep ache in the joint, squeezes the joint with the opposite hand, and pushes several fingers across the humeral head, this indicates compression thrust manipulation.

In any shoulder problem, cervical and upper thoracic joint dysfunctions, costovertebral joint dysfunctions, and a myofascial band beginning in the interscapular muscles and ending at the mastoid should be considered and treated,



With myofascial band involvement the patient will make a sweeping motion the fingers along the extent of the band. The patient may sweep the fingers from the mid interscapular muscles up the neck to the mastoid. The patient may also sweep the fingers from the forearm and up the anterior shoulder, or from the forearm up the posterior shoulder. Another common band is indicated by the patient sweeping the fingers from the shoulder and up the neck to the mastoid.



Tightness, spasm, or ache in the upper arm, with the patient squeezing the upper arm can indicate a superficial fascial disruption. This distortion of the upper arm can cause global loss of motion and be very painful. Double thumb technique is used and the patient instructed in ice massage at home. Recheck the next day and re-treat with double thumb or whole hand technique.

In adhesive capsulitis or frozen shoulder the prominent distortions are the upper trapezius herniated trigger point and myofascial bands. The trigger points are treated first and then the bands. If after treating all the trigger points and all the bands, the patient still has global loss of motion, then the synovial fixation of the glenohumeral joint has to be treated. Start with mobilization and lead into manipulation of the shoulder joint.



With enthesopathy of the shoulder the patient will point with the finger to one or more spots of pain. These are treated with entheses compression or electric point stimulation.



The patient will push the fingers into areas of muscle containing active herniated trigger points. The muscles capable of causing posterior shoulder pain include the scalenes, teres major, subscapularis, posterior deltoid, and triceps brachii. Muscles capable of causing lateral shoulder pain include the supraspinatus and the middle deltoid. Anterior shoulder pain can be caused by active trigger points in the infraspinatus, coracobrachialis, biceps brachii, anterior deltoid, and scalenes.

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