

OSTEOARTHRITIS SHOULDER

Version 2b draft

Document control

Version history

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Description

The shoulder joint is particularly vulnerable to the development of pain and restriction of movement because of its wide range of movement and the complex interrelationships of the muscles, tendons and bursae.

There is considerable confusion regarding the nomenclature of shoulder joint disease with different authorities referring to a single clinical presentation in different ways.

Anatomical, pathological and symptom complex have all been used to describe the same condition eg rotator cuff lesion□.

In this protocol, the terms used are those employed by the Arthritis and Rheumatism Council for Research. (ARC).

The complexity of the shoulder joint both in the arrangement and the number of its components and their interplay during the large range of movement can create problems in correctly interpreting the clinical findings.

Four areas of the shoulder joint are important clinically: -

1. The glenohumeral joint, frequently referred to as the shoulder joint.
2. The acromioclavicular joint to which is linked the scapula
3. The sternoclavicular joint
4. The shoulder/rotator cuff, consisting of almost a complete annulus of tissue comprising the fusion of the joint capsule with the musculotendinous insertions of subscapularis (front), supraspinatus (above) and teres minor/infraspinatus (behind) and intimately associated with the biceps tendon.

Osteoarthritis can affect areas 1-3.

A combination of unhampered movements of the articular joints (the glenohumeral joint, acromioclavicular joint, sternoclavicular joint, subacromial joint and the sub-scapulothoracic articulations) and the periarticular (rotator cuff, subacromial bursa and biceps muscle) structures is necessary for the accurate positioning of the arm and hand.

Aetiology

The pathophysiology of OA of the shoulder involves both soft tissue and bony structures. Soft tissue defects can result in instability while cartilage and bone loss result in incongruity with altered mechanics abnormal movement and progressive joint destruction.

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Despite a relative increase in degenerative changes with ages, most shoulder pain in the absence of inflammation is nonarticular and is often caused by mechanical impingement and tendinitis.

A south eastern United States study of degenerative joint disease in 1991 showed that arthritis of the shoulder, elbow (and knee) were the most common sites in hunter-gatherers and agriculturists (1).

Athletes appear to have an increased prevalence of arthrosis of lower limb joints but a decreased prevalence in the neck and shoulder (2).

Prevalence

Until the 1960s, epidemiological studies in the USA (3) examining specific joint involvement often did not include the shoulder joint as part of the evaluation.

Painful shoulder disorders are common and have an estimated prevalence of 8% (4).

No specific figures are generally available for the prevalence off osteoarthritis of the various joints of the shoulder but in one American radiological study 1 in 1000 people (average age 79 years) were said to have 'primary' osteoarthritis of the shoulder based on joint space narrowing (5).

Diagnosis

The natural history of osteoarthritis of the shoulder is unpredictable and therefore signs and symptoms vary mainly because of the diversity of conditions leading to secondary OA in this joint.

Classification

Osteoarthritis in the shoulder joint is generally classified as primary (idiopathic) or secondary (conditions known to be associated with its aetiology).

As previously outlined (see general introduction to OA) the secondary conditions can be :

- (i) anatomical such as avascular necrosis/bone dysplasias.
- (ii) metabolic such as endocrine disorders including acromegaly and
- (iii) hyperthyroidism and systemic metabolic diseases such as haemachromatoses.
- (iv) traumatic such as fractures etc,
- (v) inflammatory such as crystal deposition diseases and rheumatoid arthritis.

1. Glenohumeral osteoarthritis is usually symptomless although some crepitus with a minor ache may be present for many years. Symptoms can then arise with relatively minor trauma to the joint after a brief period of immobility.

Radiographically, there is joint space narrowing, humeral head flattening and osteophyte formation at the inferior margin. There may be subarticular cyst formation in the superior aspect of the head of the humerus[6].

The glenoid may also show flattening with sclerosis and in advanced cases some posterior erosion.

Interestingly, the rotator cuff is usually intact in osteoarthritis probably because only an intact rotator cuff would provide the necessary muscle forces to produce these deformities [7].

This is in contrast to the findings in rheumatoid arthritis where there are greater erosive changes, soft tissue changes and a torn rotator cuff in up to one third of cases.

Muscular compression across the glenohumeral joint is essential to centralise the head of the humerus within the glenoid cavity and prevent abnormal translation

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usually upwards.

The compressive force at the glenohumeral joint is maximal at 90° of abduction.

2. The acromioclavicular joint is formed by the articulation of the distal clavicle with the acromium. The thin, fragile articular disc between the joint space frequently undergoes degenerative changes after the second decade of life [8]. Isolated involvement of the AC joint in osteoarthritis is unusual. Usually it is part of a global shoulder dysfunction with glenohumeral arthritis or impingement.

3. The sternoclavicular joint provides the only bony articulation between the shoulder girdle and trunk and the intra-articular disc is larger and stronger than that of the AC joint. OA is usually due to trauma although asymptomatic degenerative changes do occur without a history of trauma in the third and fourth decades of life [5].

Pain and movement limitation are common. Patients with primary OA usually experience a gradual increase in pain over months or years. The pain is usually described as diffuse and aggravated by movement.

A grinding crepitus on the glenohumeral joint is often present. Secondary soft tissue contracture due to restricted movement often occurs although a satisfactory range of movement can be maintained, despite marked degenerative changes on x-ray, because of compensatory scapulothoracic movement.

Slight tenderness may be present over the anterior glenohumeral joint, the rotator cuff or the biceps tendon. It has been stated [9] that tenderness along the posterior joint line is the most important sign indicating osteoarthritis of this joint.

Physical findings in OA of the AC and SC joints are limited. The AC joint is usually grossly normal to inspection and tenderness over the joint is the only consistent finding. Degenerative changes of the SC joint can present with joint swelling and local tenderness.

Radiographic assessment of the shoulder is usually confined to plain x-rays with specific views for particular conditions.

As with OA in general, radiographic evidence does not correlate well with clinical findings because degenerative changes are frequently asymptomatic.

Arthrography and ultrasound together with MRI and CT scanning are not normally required in the diagnosis of OA of the shoulder although they can be very helpful when the diagnosis is questionable.

Differential Diagnosis

Shoulder inflammation and pain occur in many rheumatic disorders.

Pain in the shoulder can frequently be referred and therefore can be the initial

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presentation of several disorders including cervical spinal problems (both mechanical and neurological), thoracic outlet syndrome, apical tumours of the lung (Pancoast), diaphragmatic irritation and ischaemic heart disease.

Rheumatoid arthritis : Rheumatoid arthritis can quite commonly involve the glenohumeral joint, the subacromial space and the rotator cuff itself can become damaged.

Cervical spondylosis : This may present with shoulder pain but there is usually pain in areas outside those of a C4 and C5 dermatomal distribution. There is usually a painless arc of shoulder movement while neck rotation or compression may trigger the pain.

Capsulitis : Primary as in rotator cuff syndrome where pain has a vague distribution and may be exacerbated by movement or lying on the affected side. None of these symptoms are particularly distinguishing features and this was demonstrated by a study in 1992 which found that in many cases arthroscopic evaluation was sometimes the only way of distinguishing between an impingement syndrome and/or glenohumeral degenerative disease.

Systemic lupus erythematosus : SLE can involve the shoulder. Anti-nuclear antibodies will be found in 96% to 99% of cases. There may also be the appearance of the malar flush (butterfly rash), though this is only present in 30% of cases.

Gout : Gout is not uncommon in the shoulder joint, although pseudogout with calcium pyrophosphate crystals is rarer.

Synovial osteochondromatosis : This condition can generate multiple loose bodies which may be seen in the joint and give rise to impingement syndrome.

Haemarthrosis : Patients on anti-coagulant therapy can present with tender shoulder joint swellings and global restriction of movement. They require drainage and review of anticoagulant medication. Shoulder effusions are rare and require further investigation.

Immobilisation : hemiplegia and prolonged strapping after dislocation are causes of shoulder pain associated with limitation of movement. The history is normally diagnostic.

Main Disabling Effects

Generally shoulder dysfunction is unusual in osteoarthritis

Assessment of disability specific for the shoulder joint (SPADI) has been described (11) in addition to generic disability questionnaires such as the Health Assessment Questionnaire (12). All are subjective in that they require self completion by the patient and none relate only to osteoarthritis.

In 1994 a study comparing patients in the community (a cross-sectional population survey) with a group attending general practitioners in Manchester found that the frequency with which a range of disabilities was reported correlated well with the objective measurement of restricted shoulder movement (13).

The most commonly reported problem was sleep disturbance. Arm and hand movement was reported as difficult and this affected the speed of dressing and particularly pulling a garment over the head.

Abduction of the shoulder and placing the thumb on the spine were the most restricted movements.

Up to 27% questioned reported no restriction in these everyday activities because of their shoulder symptoms (13).

A study funded by the Arthritis and Rheumatism Council in 1996 (14) gave broadly similar results. Again sleeping and dressing, where clothing had to be pulled over the head or fastened at the back, caused most problems.

Prognosis

- OA of the shoulder usually responds to conservative treatment
- Patients with primary OA usually experience a gradual increase in pain over months or years.
- Generally shoulder dysfunction is unusual in osteoarthritis.
- Secondary soft tissue contracture due to restricted movement often occurs, although a satisfactory range of movement can be maintained despite marked degenerative changes on x-ray.
- Although effective, the results of injection of corticosteroid and/or local anaesthetic preparations to the AC joint are after short lasting.
- The primary indication for surgery is pain unresponsive to medical management. The results of shoulder arthroplasty are good to excellent in 86-94% of patients.

Treatment

Following assessment and diagnosis, the treatment for osteoarthritis of the shoulder follows that for osteoarthritis in any joint.

Non-pharmacological : Physiotherapy utilises mainly mobilisation of the joint but where they are not sufficient NSAIDs are often given in place of, or in addition to, simple analgesics.

Joint Injection : the AC joint is readily accessible to injection of corticosteroid and/or local anaesthetic preparations. Although effective, the results are often shortlasting.

Surgery : OA of the shoulder usually responds to conservative treatment.

The primary indication for surgery therefore is pain unresponsive to medical management.

The procedure of choice for degenerative changes in the glenohumeral joint is hemiarthroplasty or total shoulder replacement depending on the condition of the glenoid. The results of shoulder arthroplasty are good to excellent in 86-94% of patients.

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