



Shoulder Injury and Disability

Discussion paper prepared for

The Workplace Safety and Insurance Appeals Tribunal

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Prepared by:

Dr. Hans K. Uthoff

Orthopaedic Surgeon

Dr. Hans K. Uthoff graduated from the University of Marburg, Germany in 1951. He did post-graduate training in Surgery at Municipal Hospital of Remscheid, Germany from 1952 to 1953, in Orthopaedic Surgery at Hôpital du Christ-Roi de Verdun, Québec from 1954 to 1956, in research in the department of physiology at Université de Montréal from 1956 to 1957, and in Orthopaedic Surgery at Hôpital du Sacré-Coeur de Cartierville from 1957 to 1958. He was granted his fellowship in Orthopaedic Surgery in 1961. He was an Assistant Professor in the Department of Surgery at Université de Montréal from 1971 to 1973, and joined the faculty at the University of Ottawa in 1973. He held the rank of full Professor in the Department of Surgery. His clinical and research interests were in Orthopaedic Surgery, and he published widely in that area. He served as a consultant at LaSalle General Hospital from 1961 to 1973, at Hôpital de Verdun, Québec and Hôpital St Joseph in Maniwaki from 1973 to 1976, and at Ottawa General Hospital from 1973 to 2003. He was the Chief of the Division of Orthopaedic Surgery at Ottawa General Hospital and the Head of the Division of Orthopaedic Surgery at the University of Ottawa from 1976 to 1992. From 1992 to 1995 he was Chairman of the Department of Surgery at the University of Ottawa and is now a Professor Emeritus. Currently, he is teaching students in the French stream at the medical faculty, is involved in funded medical research and works as an orthopaedic consultant visiting Iqaluit, Nunavut, and various settlements three time a year. Dr. Uthoff was an assessor for the Tribunal from 1997 – 2000.

This medical discussion paper will be useful to those seeking general information about the medical issue involved. It is intended to provide a broad and general overview of a medical topic that is frequently considered in Tribunal appeals.

Each medical discussion paper is written by a recognized expert in the field, who has been recommended by the Tribunal's medical counsellors. Each author is asked to present a balanced view of the current medical knowledge on the topic. Discussion papers are not peer reviewed. They are written to be understood by lay individuals.

Discussion papers do not necessarily represent the views of the Tribunal. A vice-chair or panel may consider and rely on the medical information provided in the discussion paper, but the Tribunal is not bound by an opinion expressed in a discussion paper in any particular case. Every Tribunal decision must be based on the facts of the particular appeal. Tribunal adjudicators recognize that it is always open to the parties to an appeal to rely on or to distinguish a medical discussion paper, and to challenge it with alternative evidence: see *Kamara v. Ontario (Workplace Safety and Insurance Appeals Tribunal)* [2009] O.J. No. 2080 (Ont Div Court).

THIS PAPER HAS BEEN PREPARED TO HELP NON-MEDICAL PERSONS UNDERSTAND MEDICAL PROBLEMS INVOLVING THE SHOULDER.

Introduction:

I believe that clarification of terms used in this discussion paper is in order.

INJURY refers “to a damage inflicted to the body by an external force” (Dorland, Medical Dictionary). Obviously, this acute happening must be supported by documentation as to the exact day and hour. Description of the accident helps to understand the mechanism of the injury.

DISORDER describes the presence of an impairment that is chronic in nature; it does not describe a symptom i.e. pain. For example, pain is often the first clinical evidence of calcifying tendinitis. However, the deposition of calcium salts (formative phase) precedes this evidence but is usually painless. Pain arises only when nature attempts and succeeds removing the deposit (resorptive phase). Thus pain cannot always be interpreted as the beginning of a disorder. The term musculoskeletal disorder (MSD) has come to replace the term musculoskeletal disease (Wells 1997). None of the common MSDs is caused uniquely by work exposure. Physical and social aspects outside work have to be considered (National Research Council 2001). The same Council also states that MSD is not unique to any occupation; it is more activity-related than work-related. In other words, work-related disorders are multifactorial with work contributing significantly though not exclusively to causing the disorder (WHO 1985).

Bernard (1997) addressed specifically occupational shoulder disorders (OSD). He used five criteria for assessing evidence:

1. Strength of association
2. Temporal relationship.
3. Consistency of association.
4. Coherence of evidence.
5. Exposure-response relationship

He stated that the evidence for risk involved in getting OSD is the maintenance of specific shoulder postures such as holding a tool while working overhead. Furthermore, he specified this position as being greater than 60 degrees of flexion (forward elevation) or abduction.

Anatomy of the Shoulder

A. Bones. (Figure 1).

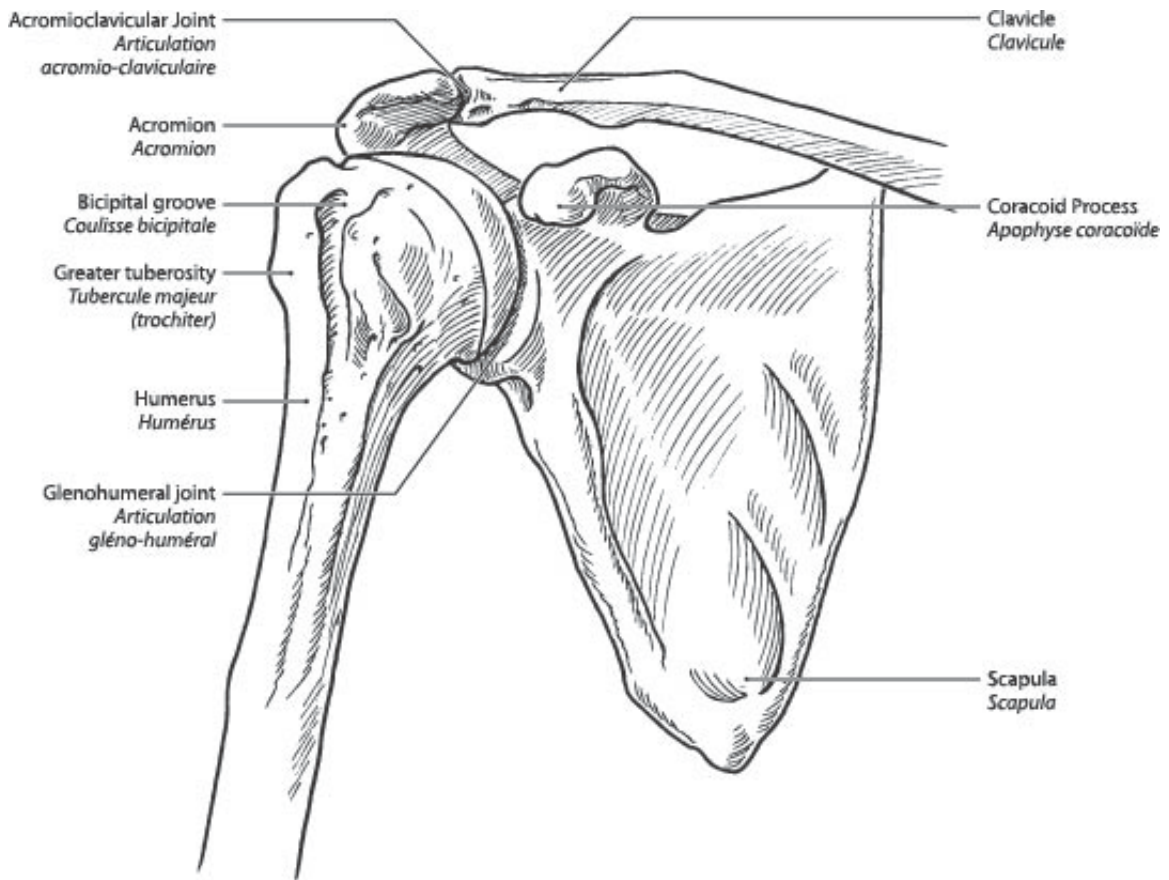
Three bones form part of the shoulder

1. The collar bone (**clavicle**) located in front, at the base of the neck.
2. The upper arm bone (**humerus**) connecting the shoulder with the elbow
 - a. The **scapula** or shoulder blade is located on the back of the rib cage. Where it reaches the area of the shoulder, it has two processes (prolongations) (a and b), and two articular cartilage surfaces (articular cartilage is a white, glistening, smooth surface layer) (c and d).
 - b. The **acromion** on top of the shoulder
 - c. The **coracoid process** in front of the shoulder
 - d. The **glenoid cavity** for articulation with the upper arm bone, the head of the humerus
 - e. The **acromial articular cartilage** for articulation with the collar bone.

B. Joints (Figure 1)

The main shoulder motions take place at three levels.

1. The articulation or joint between the shoulder blade and upper arm bone is known as the **glenohumeral** joint. If the contact between these bones is lost, the patient says that his shoulder is out of joint, and the doctor talks about **shoulder dislocation**. If contact is lost only partially, we, as doctors, speak about a **subluxation**. Dislocation and subluxation can occur in different directions, the most frequent one being a forward displacement, **anterior** dislocation (**Figure 2**). If a shoulder joint dislocates more than once, we speak about recurrent dislocation. The force needed to get this joint out of place for the first time is considerable, but usually trivial at the subsequent dislocations. Some persons are able to dislocate their shoulder at will - a condition called voluntary or habitual dislocation, obviously without a history of injury.



Bones of the shoulder
Les os de l'épaule

Figure 1

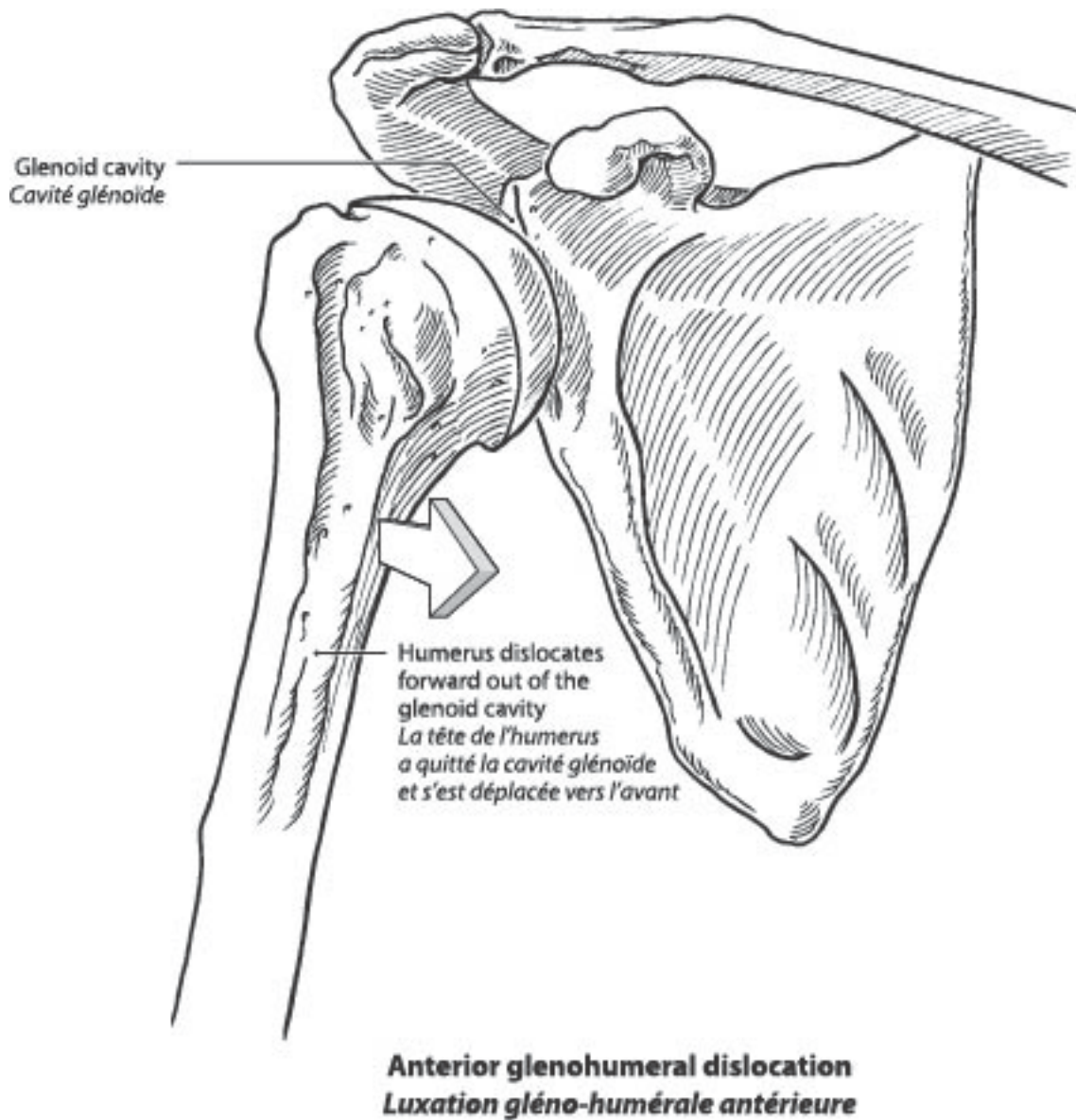


Figure 2

2. Motion also occurs between the shoulder blade and rib cage (**scapulothoracic** motion). There is no joint or articulation at this level. There is a gliding motion between the two neighbouring, muscle-covered bones.

3. During scapulothoracic movement, motion also occurs between shoulder blade and collarbone (at the **acromio-clavicular** joint). As stated before, the acromion is part of the shoulder blade that acts somehow as a roof to the upper portion of the humerus, the humeral head. If the collarbone loses its articulating contact with the acromion, patients talk about a shoulder separation and doctors prefer to talk about an **acromioclavicular dislocation (Figure 3)**. A subluxation, a partial separation, can also occur.

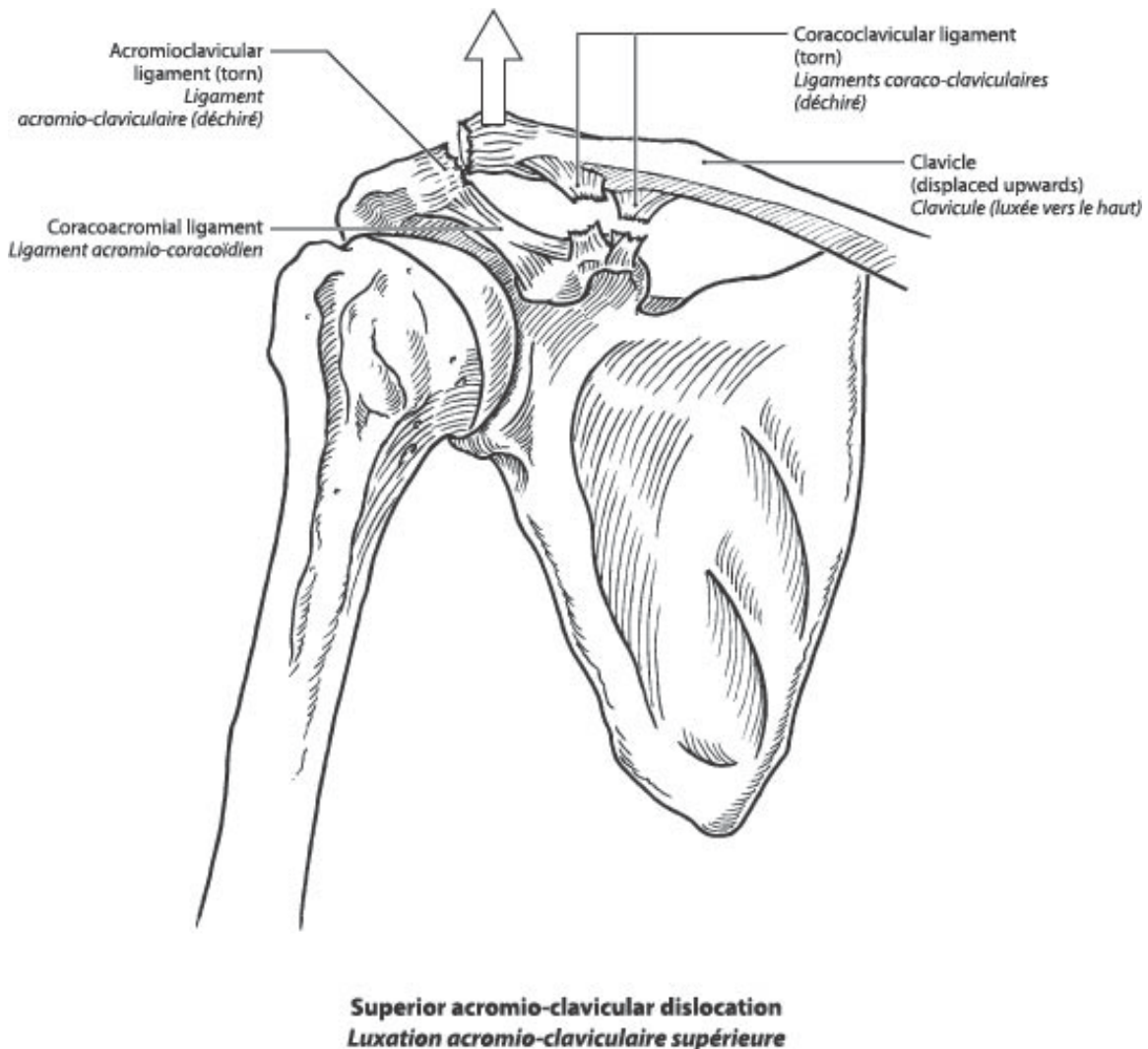


Figure 3

C. Capsule and Ligaments (Figure 4)

At the level of any joint, the bones are held together by a sheet of tissue (the capsule), and by strong bands (the ligaments). The innermost layer of the

capsule is lined by a layer of cells, called synovium, that produces the joint fluid. The bones, covered by articular cartilage, and the capsule form the joint cavity. The capsule is attached to glenoid as well as to the humeral head. The junction between the capsule and the glenoid is formed by a fibrocartilaginous tissue, the labrum. Of note is the fact that the labrum is devoid of blood vessels. The bones involved are the glenoid, part of the scapula, and the humeral head. The capsule makes a joint watertight; this means that the joint fluid cannot escape. Joint fluid ensures the lubrication of a joint, and the nutrition of articular cartilage cells. If the amount of joint fluid is increased, we speak of an **effusion**. This condition is often accompanied by an inflammation of the innermost layer of the capsule, a condition known as **synovitis**.

Ligaments function as checkreins. At the joint between shoulder blade and humerus, the anterior (**glenohumeral**) ligaments are one of the most important ones. Before the shoulder can dislocate the ligaments must tear and the capsule rupture. When this tear occurs at the labrum, the site where the capsule inserts into the anterior aspect of the glenoid, clinicians speak of a Bankart lesion. As the labrum is devoid of blood vessels (avascular), healing of the tear cannot take place. If these structures do not heal after a first-time dislocation, and a hole remains in the capsule, the shoulder can re-dislocate with a minor effort. In such a case, surgery is needed to close the defect, to restore the original tension of ligaments and capsule. Many episodes of recurrent dislocation can lead to **arthritis** meaning that the smooth gliding surfaces of the opposing bones (articular cartilage) are getting rough and irregular, sometimes to a point where entire areas of articular cartilage are lost and the underlying bone is exposed. A dislocation sometimes produces a dent in the humeral head, known as a Hill-Sachs lesion.

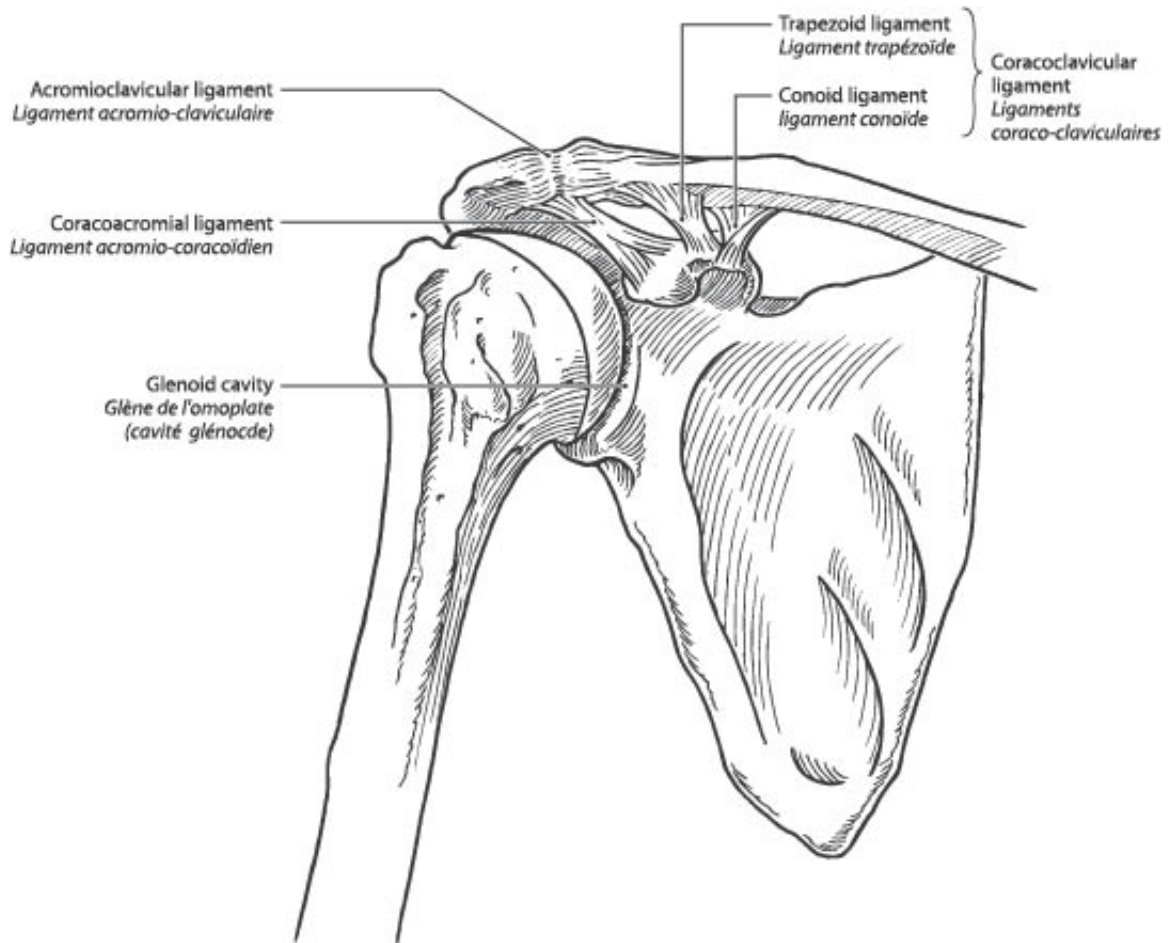
Since articular cartilage does not contain calcium like bones, it cannot be seen on plain x-rays. Instead, we see an apparent space between the bones on x-ray films. When the articular cartilage wears down, becoming thinner, the bones get closer to each other; we speak about a narrowing of the joint space, a definite sign of arthritis. Joint space can be defined as the distance between two bones at the level of an articulation as seen on plain x-ray films.

A separation of the shoulder, the **acromioclavicular** dislocation (**Figure 3**), is only possible when ligaments tear, either the ligaments reinforcing the capsule or the ligament holding the clavicle down to the scapula (coracoclavicular ligament). The latter ligament is not situated at the level of the acromioclavicular joint but further medial, between the mid part of the collar bone and coracoid process. To keep the clavicle in its normal position after a dislocation, surgery is required as the flat opposing joint surfaces preclude a maintenance of the reduction. This then is contrary to the glenohumeral dislocation that is stable after reduction. A reduction is a manoeuvre whereby the components of a joint are replaced in their normal, anatomic relationship.

Fortunately, unreduced acromioclavicular subluxations are often well tolerated. On the other hand, unreduced glenohumeral dislocations need surgical attention.

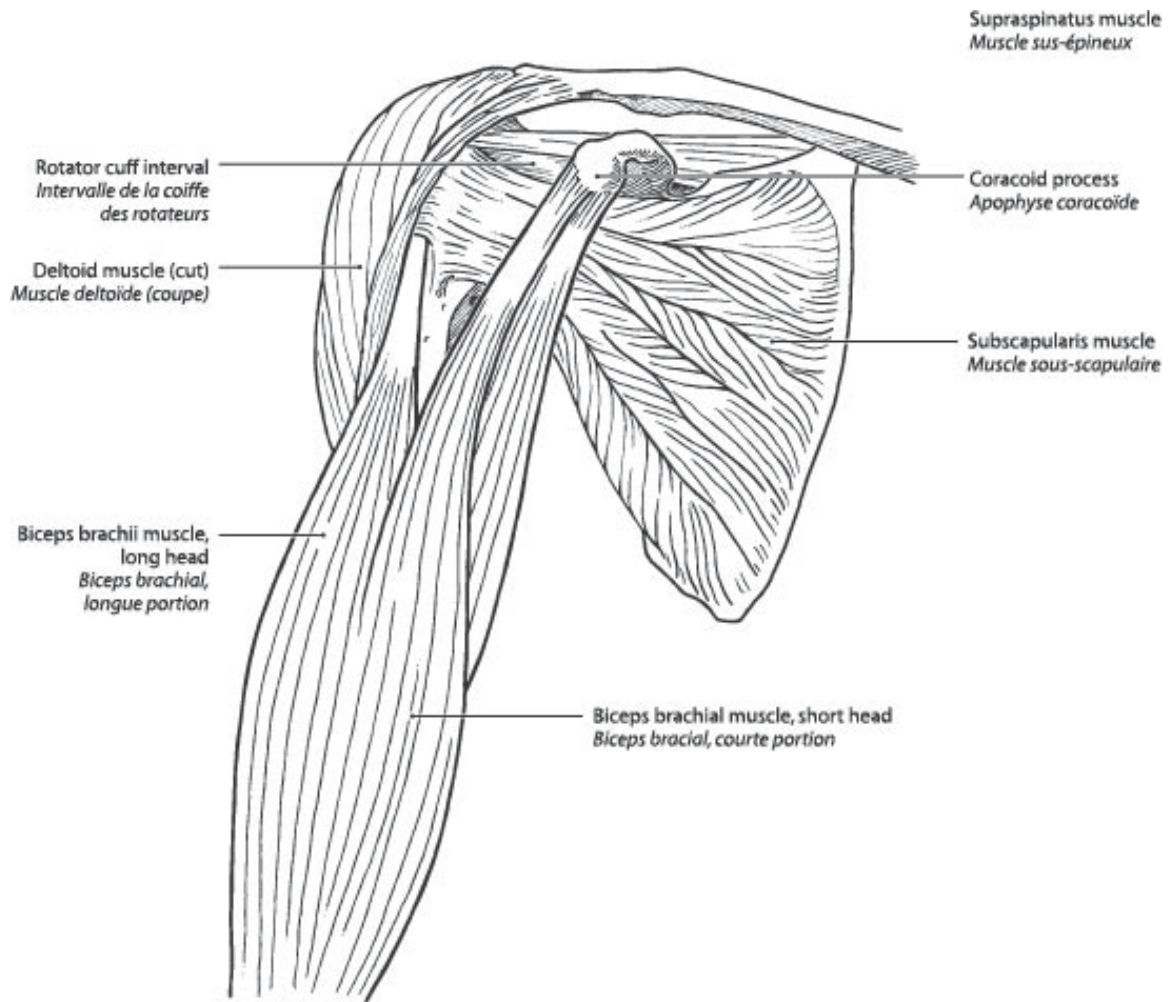
One other ligament needs to be mentioned, the **coraco-acromial** ligament (**Figure 4**). It spans from the acromion to the coracoid process (acromion and coracoid processes are part of the shoulder blade). Acromion, coraco-acromial ligament and coracoid process form the coraco-acromial arch, a structure which lies over the humeral head. In between the arch and humeral head, pass the rotator cuff tendons (**Figure 5**). The area occupied by all the above mentioned elements: the acromial arch, together with the rotator cuff and the humeral head play a role in the **impingement syndrome**.

Any joint can be put through a range of motion by the examiner without any help from the person to be examined; this is known as passive motion. Under normal circumstances, only the capsule and ligaments, as well as the configuration of the joint, will limit the range of passive motion. Motions done by the examinee are known as active movements. The extent of mobility is known as the range of motion (ROM); usually a distinction is made between active and passive ROM.



Ligaments of the shoulder
Ligaments de l'épaule

Figure 4



Anterior view of the muscles of the shoulder
Vue de face des muscles de l'épaule

Figure 5

D. Muscles and Tendons (Figures 5 & 6)

Active motion, as opposed to passive motion, is only possible through the action of the muscles of the person examined. During testing of the active range of motion, the examiner can determine the function, as well as, the strength of muscles. Obviously, the prerequisite is the co-operation of the examinee. Strength is often tested by active movements against resistance. Pain, provoked by movements, may be one reason for the limitation of the active and passive range of motion. Another reason could be the

unwillingness of the examinee to reveal to the examiner the exact extent of mobility.

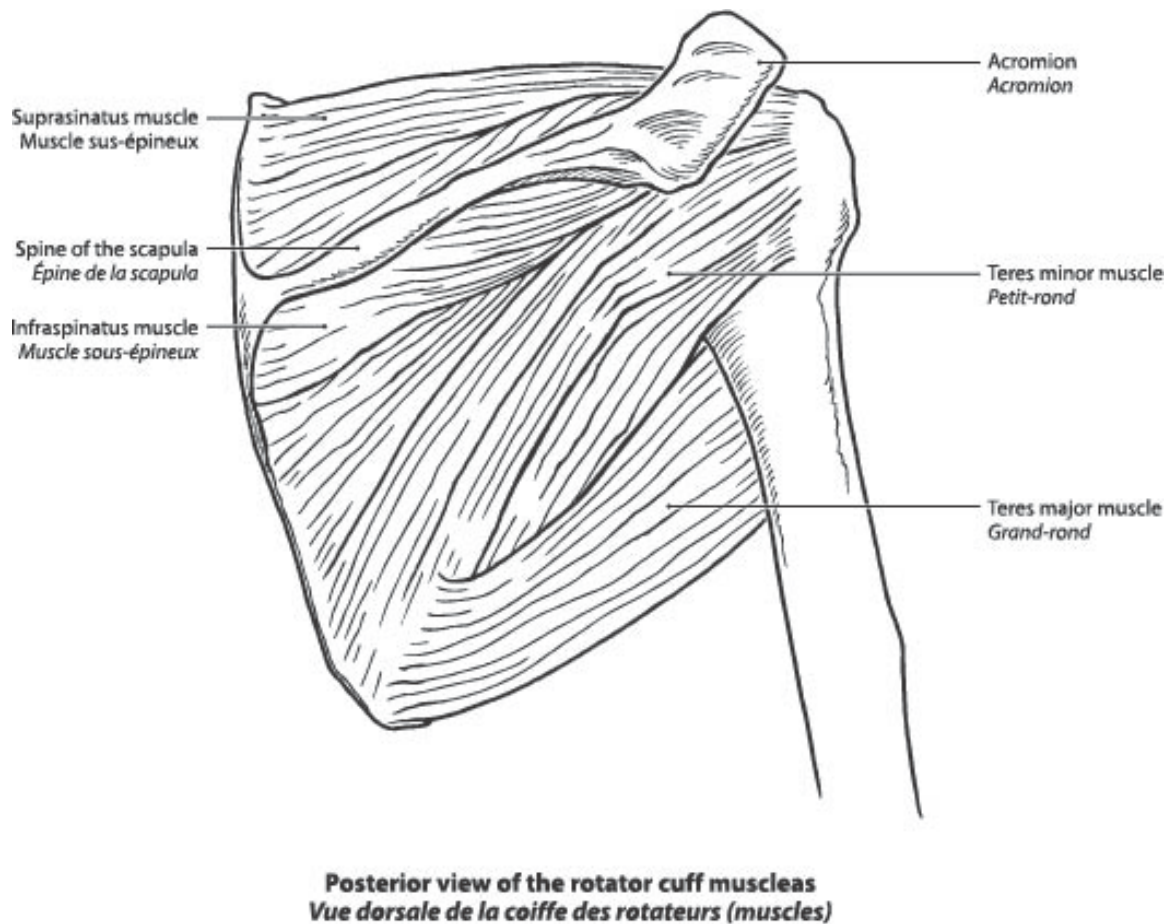


Figure 6

Muscle is a fleshy tissue that the body uses to move a joint. Active muscle contraction is a prerequisite for such a movement during which the joint acts as a hinge. At some sites, the muscle spans the entire distance between its origin from one bone and its insertion into the other, crossing on its way a joint. At other sites, we have a **muscle-tendon unit** where the muscles originate from one bone, then continue in form of a tendon, which, in turn, inserts into the other bone, again having crossed at least one joint. An example is a finger flexor where the muscle is situated in the forearm; at the level of the wrist it continues as a tendon that crosses the hand to insert into a finger.

At the level of the shoulder, muscle contractions allow forward bending (**flexion**), backward movement (**extension**) (**Figure 9**), turning (external or

internal **rotation**) (**Figure 10**), as well as movements toward (**adduction**) or away from the body (**abduction**) (**Figure 11**).

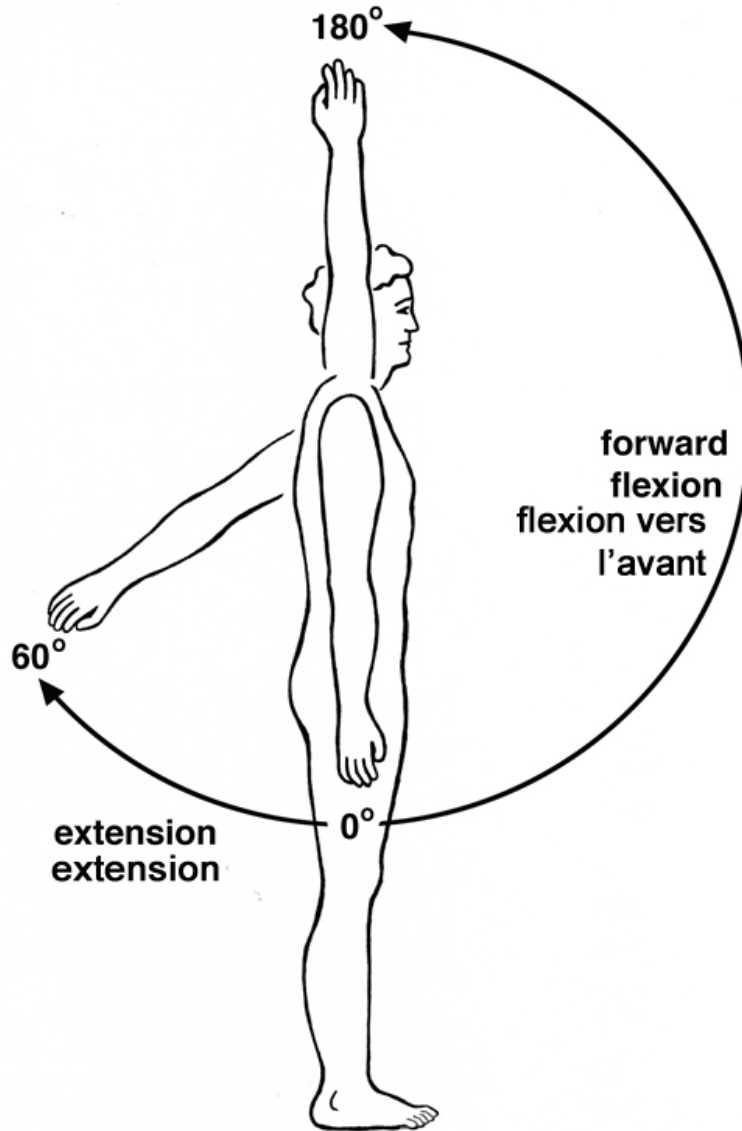


Figure 9 - Flexion and Extension
Flexion et extension

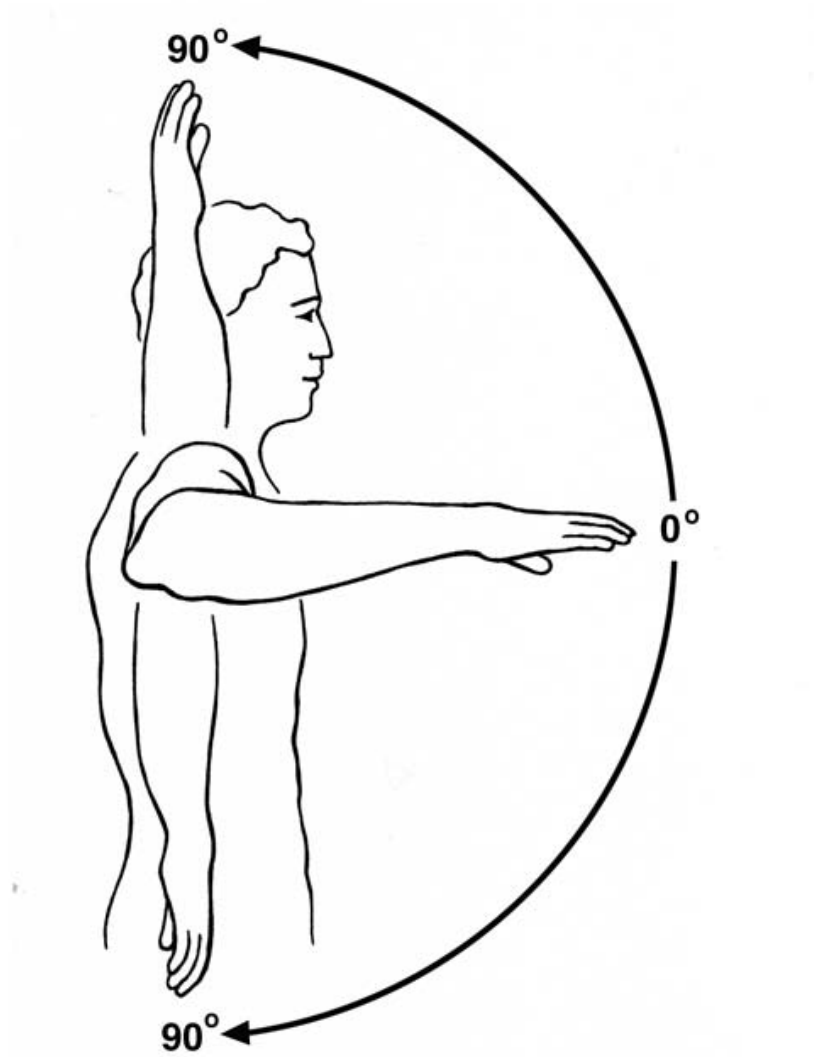
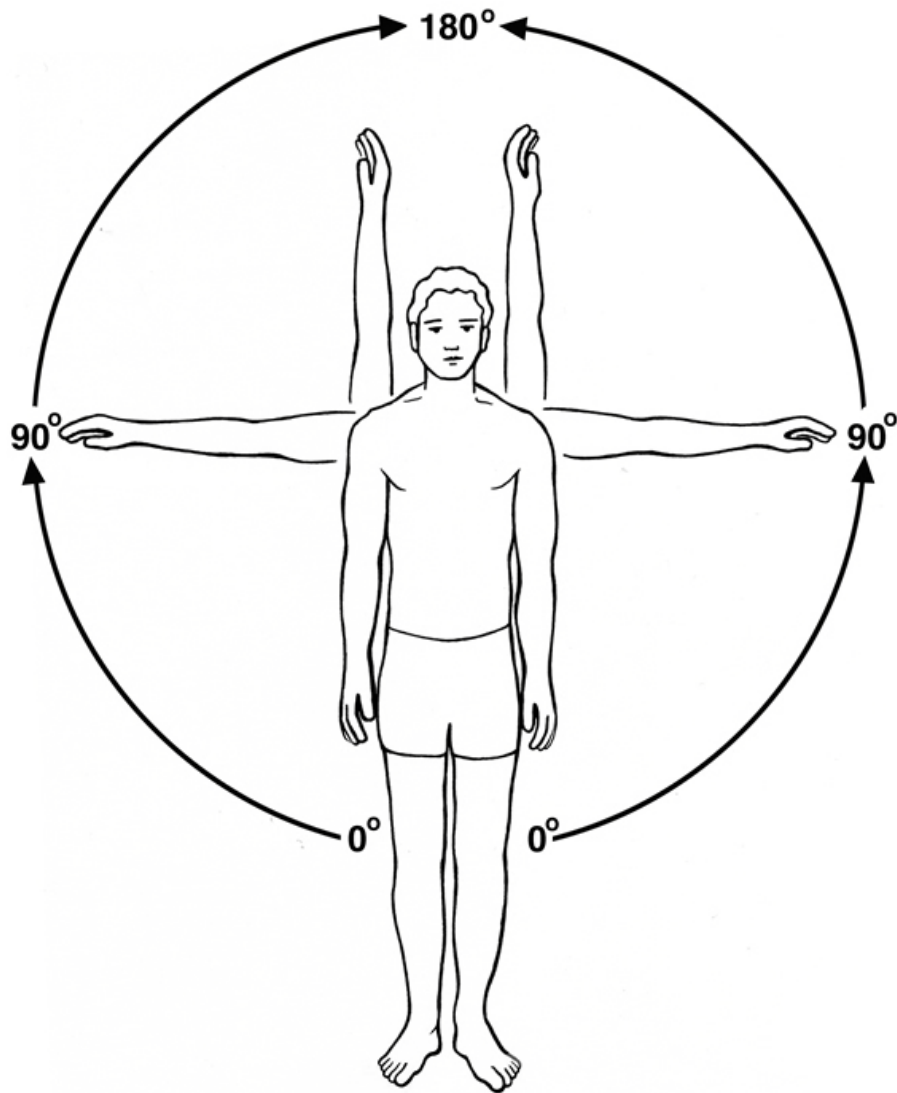


Figure 10 - Internal and External Rotation
Rotation interne et externe



**Figure 11 - Abduction
Adduction**

At the **glenohumeral joint** (between humerus and shoulder blade), we distinguish between a deep and a more superficial (directly under the skin) group of muscles. The deep group of muscles comprises the **subscapularis** in front, the **supraspinatus** on the top and the **infraspinatus** and **teres minor** behind the humeral head. Their tendinous continuations form a hood over the humeral head, known as the **rotator cuff**. The rotator cuff interval is situated between the tendons of the supraspinatus and the subscapularis muscles. The main function of all four muscles is to stabilize the humeral head in the glenohumeral joint. The second function is active motion. The subscapularis rolls the arm inward (internal rotation), the supraspinatus brings the arm away from the body (abduction) and the infraspinatus and teres minor roll the arm outwards (external rotation). Rotator cuff tendons may tear in response to a severe injury where the external force is greater than the strength of a healthy tendon (young individuals). In this instance, a piece of bone is often avulsed (torn away by force) from the greater tuberosity of the humeral head together with the tendon. The greater and the lesser tuberosities are bony prominences of the humeral head; they are situated outside the glenohumeral joint (extraarticular)

In the more common type of rotator cuff tear, the tearing (**Figure 7**) occurs in older individuals with a moderate external force, such as during the lifting of objects. It causes a tear of a cuff tendon close to its insertion into bone. This site has been weakened by age-related, and maybe by activity-related, changes (middle aged and older persons), already present at the time of the incident. The incidence of age-related rotator cuff tears increases with age to a point where tears may occur in the absence of a history of injury. This happening must be considered as a disorder and not as an injury. Following a tear, active movements are restricted or impossible since the continuity between origin and insertion of the muscle-tendon-bone unit is disrupted. As the supraspinatus tendon is usually affected, it results in impaired abduction. The person cannot hold his/her arm in a position at 90 degrees away from the body (abduction). If the infraspinatus is torn, external rotation is weak and if the subscapularis is disrupted, internal rotation is affected.

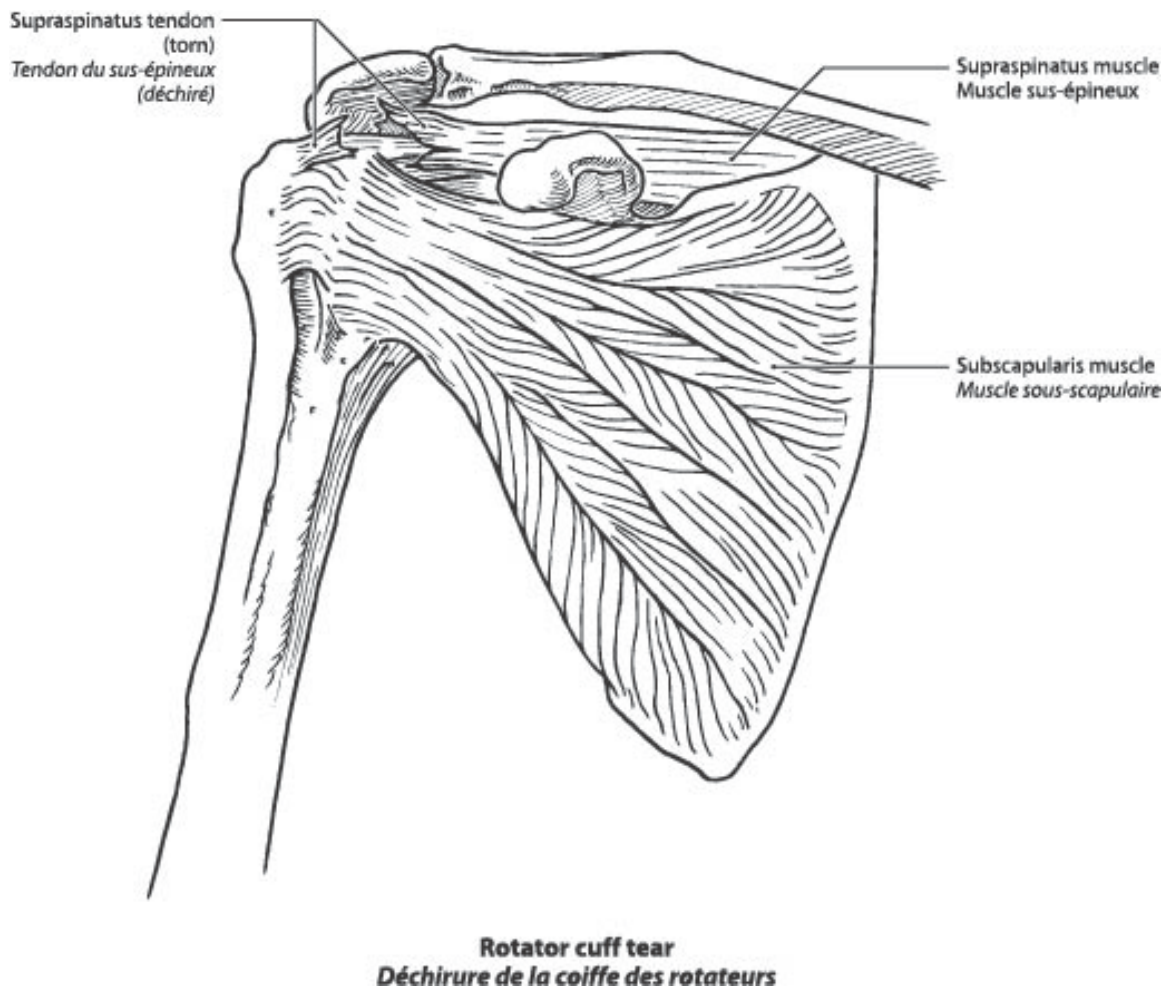


Figure 7

Another deep structure is the long head of the **biceps muscle**, a muscle effecting forward flexion of the shoulder and flexion of the elbow (it spans two joints). The long head of the biceps originates from the scapula inside the glenohumeral joint. It then travels in an interval between the subscapularis and supraspinatus tendons, and glides through a groove between two bony prominences of the humeral head (**lesser and greater tuberosities**). It is then joined below the exit from the groove by the short head of the biceps which originates from the coracoid process (biceps = two heads). The biceps inserts into one of the two forearm bones, the radius. Its action at the shoulder is to bring the arm forward and at the elbow to bend the forearm. A tear of the long head of the biceps (**Figure 8**) is often seen in patients suffering from a degenerative rotator cuff tear and usually occurs without any significant trauma. As a result, the biceps muscle shortens and becomes more prominent (thicker) in front of the upper arm. Obviously, elbow bending becomes weaker. To repeat, a tear is the consequence of a disorder and not of an injury.

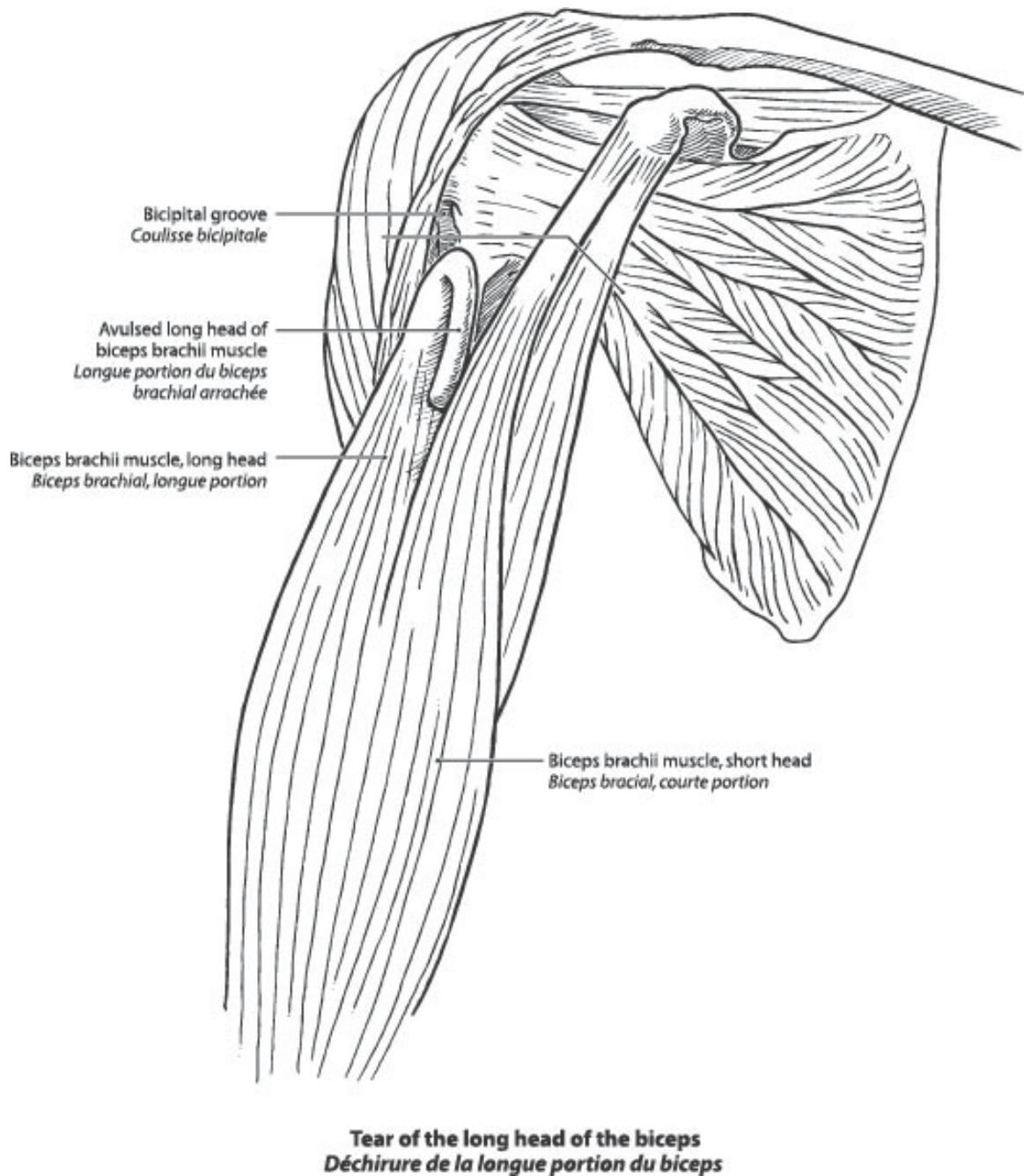


Figure 8

The superficial muscle covering the entire shoulder is called the **deltoid muscle**. For purposes of functional activity, doctors distinguish between an anterior, middle and posterior part. The parts contribute to forward elevation (**flexion**), to moving the arm away from the body (**abduction**) and pushing the arm backwards (**extension**). Paralysis causes a functional disability. Tears are unknown. During shoulder surgery, the muscle is sometimes

detached from its bone origin. If sutures are not strong enough or fail to hold the muscle to bone during healing, the muscle will not heal back to the bone, a space remains between muscle and bone (**dehiscence**) resulting in a considerable loss of function.

E. Bursae

Bursae are flat bags containing small amounts of fluid. They allow gliding between two neighbouring structures. During movements, the humeral head together with the rotator cuff tendons covering it, glides against the coraco-acromial arch. The smoothness of gliding is made possible by the **subacromial bursa**, a narrow but extensive sac filled with small amounts of lubricating fluid (synovial fluid). It extends also under the deltoid muscle, and this part is known as the **subdeltoid bursa**. Under normal circumstances, the subacromial bursa does not communicate with the glenohumeral joint cavity. It does so, however, after a complete tear of the rotator cuff. When the amount of fluid increases, we speak of an effusion; it is often accompanied by a thickening of the wall of the bursa, known as **bursitis**. A bursitis always develops in response to other pathology. Therefore, the diagnosis of bursitis must be considered as a secondary happening, the primary condition being a pathology of the rotator cuff or the coraco-acromial arch, such as spurs (osteophytes). Squeezing of the contents of the space between coraco-acromial arch and humeral head is often referred as an impingement syndrome. It is unfortunate that some physicians use the diagnosis bursitis for a painful shoulder condition they are unable to define exactly.

In front of the humeral head, a gliding motion also exists between the subscapular tendon and the underlying capsule. In this space we find the subscapular bursa. There always exists a communication between this bursa and the joint cavity. Both the glenohumeral joint and the subacromial bursa can be inspected with an arthroscope.

2. DISEASES AND DISABILITY OF SHOULDER

A. Bursitis

Bursitis of the shoulder is a disorder and usually refers to the subacromial-subdeltoid bursa that has become inflamed. This means that the bursal walls are thickened and that the amount of fluid in the bursa is increased. Bursitis almost always develops in response to an irritation by neighbouring structures. A bony outgrowth (spur of the acromion or osteophytes from an arthritic acromio-clavicular joint) or a thickened or a partially torn tendon of the rotator cuff may lead to an irritation of the bursa. With the exception of rheumatoid arthritis, bursitis can never be a primary or free standing

diagnosis. It is always secondary to an underlying disease. The diagnosis of bursitis as a work-related disorder is unacceptable.

B. Tendonitis-Tendinitis, a disorder

In the strict sense of the word, it means an inflammation of a tendon. However, microscopic examination of a biopsy sample rarely shows the presence of inflammatory cells. The process is rather characterised by other, usually degenerative, tendinous changes that lead to a thickening of the tendon. Often the diagnosis of tendinitis is based on a clinical examination. All too often, additional testing later on reveals an incomplete tear of a cuff tendon. It is therefore my opinion, that the diagnosis tendinitis should only be provisional; more detailed examinations (ultrasound, MRI or even a diagnostic arthroscopy) should be done to exclude partial tears.

C. Impingement Syndrome

The Impingement Syndrome is caused by a squeezing of the contents of the space bordered on one side by the coraco-acromial arch and the other side by the humeral head. Both structures are visible on plain x-rays. The contents consist of soft tissues, namely the rotator cuff, in particular the supraspinatus tendon, and the subacromial bursa. The squeezing of these contents in an unyielding space can have two causes:

1. A thickening of the contents, a swelling of the tendon (tendonitis) and/or a swelling of the bursa (bursitis).
2. A decrease of the space, mostly caused by bony outgrowths, such as acromial spurs, osteophytes of the acromio-clavicular joint and/or osteophytes of the humeral head.

As a syndrome is defined as “a set of symptoms which occur together” (Dorland, Medical Dictionary), the pathologic changes leading to the squeezing must be clearly described. As a symptom is the subjective evidence of a disease or of a patient’s condition (Dorland, Medical Dictionary), Impingement Syndrome cannot be accepted as a free-standing diagnosis; the cause(s) must be given.

The pain caused by the Impingement Syndrome is usually aggravated by internal rotation and flexion (forward elevation) of the glenohumeral joint.

It is sometimes argued that impingement may cause a rotator cuff tear through wear and tear. This is an exception. In most instances, the tendon is the site of the original disease, leading to a tear due to the structural weakening of the tendon; the resulting impingement will make the situation worse. In fact, outgrowths of the acromion (bony spurs) form in response to a continued pressure of thickened tendon against the acromial arch. This is

important, as the argument often goes that spurs lead to a tendinitis; spurs may aggravate the existing tendinitis. Degenerative processes inside the rotator cuff can be made worse by repeated activities with the hands at shoulder level or above it or by operating vibrating tools. Such activities, when performed repeatedly over a period lasting months and years may also affect the acromioclavicular joint leading to a joint degeneration and the formation of osteophytes. Impingement affects both genders equally. Impingement can start at an early age (around age 20) particularly in athletes. It can develop spontaneously in older people (around 50 to 60 years of age).

Is there a relationship between an isolated injury to and recurrent disorders of the shoulder and impingement syndrome?

I do not think that an isolated injury can induce an impingement syndrome. However, recurrent episodes and, more so, repetitive work and/or sports activities can cause an impingement (a disorder), usually secondary to wear and tear of the rotator cuff tendons.

D. Rotator Cuff Tear (Figure 7)

As stated before, a severe acute trauma can cause a tear, particularly in younger individuals. In that instance, a piece of bone from the humeral head (greater tuberosity) is usually avulsed together with the tendon. Obviously, this must be considered as an injury. As stated above, in middle aged or older people, changes inside the tendon (degenerative changes) make the tendon weaker to a point where the tear may occur spontaneously with no trauma or with trivial trauma. In this instance we are dealing with a chronic tear, a disorder. Work requiring repetitive or prolonged use of arms above the shoulder level (either flexion or abduction) may accelerate the progress of degenerative tendinitis and thus, may predispose to tears (work-related). Small tears may not cause any symptoms. Bigger tears cause a weakness and usually cause pain, mostly on abduction. The symptoms are usually made worse when attempting to lift the arm away from the body and the weakness is felt when performing activities with the arm at shoulder level or above it. A change of work is often required. Although degenerative tears of rotator cuffs of both shoulders are not uncommon, symptoms rarely occur at the same time.

Is there a relationship between isolated injury or recurrent disorders and partial or complete rotator cuff tears?

There is definitely a strong relationship. However, since most partial and complete tears occur in the middle aged and older person, pre-existing degenerative changes causing a weakness in tension of the tendon must have contributed. As already stated, certain repetitive movements required by work can accelerate the development of degenerative changes. This raises the question of the importance of a pre-existing condition, which in

certain workers can be activity-related. Therefore, there is a strong correlation between a shoulder disorder and partial and complete tears.

Even after a most successful repair of a rotator cuff tear, a complete recovery of function and strength cannot be expected in the middle aged and older worker.

E. Calcific Tendinitis , also known as Calcifying Tendinitis

This condition is neither caused by work nor aggravated by any particular activity. It affects females more often. Calcific deposits in the opposite shoulder occur in up to 40% of patients. Calcific tendinitis cannot be attributed to factors associated with work. The thickening of the tendon caused by the calcific deposit often leads to an impingement syndrome.

F. Recurrent Shoulder Dislocation (Figure 2)

This question has been addressed before. A first traumatic dislocation always precedes a recurrent shoulder dislocation. If the tear is at the level of the labrum, a spontaneous healing cannot take place as the labrum is devoid of blood vessels. Consequently, the humeral head can slip out easily, surgical repair is indicated. A shoulder dislocation is sometimes accompanied by a compression fracture of the humeral head, a lesion known as a Hill-Sachs compression fracture of the humeral head. This dent in the humeral head can engage the humeral head on the anterior rim of the glenoid during a subsequent recurrence of dislocation and render a reduction difficult. If dislocation recurs without a significant trauma after surgery, one must conclude that the surgical repair has not been successful. If, on the other hand, a severe trauma leads to re-dislocation, we are dealing with a new independent injury. Anterior dislocations are usually caused by very forceful external rotation with the arm in abduction (the arm in a position away from the body), a position assumed by pitchers. There is one exception to the above-mentioned cause of events. This concerns people having an inborn laxity of all ligaments (Ehlers-Danlos syndrome). Obviously, the latter condition is not work-related. In these people, a first time dislocation can occur without trauma. Repeated dislocations may lead to arthritis. Contrary to acute, first-time dislocations where a cuff tear may occur simultaneously, recurrent dislocations (a disorder) cannot be the cause of cuff tear.

What is the relationship between subluxation and dislocations and specific accidents at the workplace?

For first time dislocations and subluxations to occur, a definite injury must have taken place. Without such a history, we must be dealing with a recurrence and not a first time condition.

G. Shoulder Instability

This term is often used to describe a certain laxity of the capsule and ligaments of the shoulder leading mostly to subluxation. It may result from a first-time dislocation, an injury. In the absence of such an injury, the condition cannot be accepted as work-related. Patients complain about a feeling of insecurity while attempting certain movements.

H. Frozen Shoulder (Adhesive capsulitis)

This term is used to describe a severe, often painful and incapacitating limitation of passive and active movements. This disorder can follow a prolonged immobilization of the shoulder or it may be due to a tendinitis. This condition usually resolves, but may take up to one year of rehabilitation, consisting mainly of active exercises. In some cases, it does not resolve and stiffness may be permanent.

I. Arthritis

The most common form is degenerative osteoarthritis seen in the middle aged and older population. It is often attributed to wear and tear. Although inflammation of a joint is sometimes stated as a cause, an actual inflammatory process is most uncommon except for rheumatoid arthritis. Deformation or incongruity of opposing joint surfaces, as may result from fractures (injury) extending into the joint, can also lead to arthritis. Such a condition is known as post-traumatic osteoarthritis, a disorder related to the original injury. Degenerative osteoarthritis is usually age-related, and may be associated with familial generalized OA; it may, however be an activity-related disorder (overhead work, use of vibrating tools)

In instances of arthritis, bony outgrowths often form at the periphery of the joint surfaces; they are known as marginal osteophytes. Post-traumatic, as well as degenerative osteoarthritis usually leads to a decrease in the range of motion of a joint and to pain. At the shoulder, both the glenohumeral and the acromioclavicular joints can be the site of osteoarthritis. In some instances, total shoulder arthroplasty is required for relief of pain.

Is there a relationship between isolated or recurrent injuries to the shoulder and osteoarthritis?

1. Glenohumeral osteoarthritis.

This joint can be affected after repeated episodes of dislocations or, as in the post traumatic form, after intraarticular fractures. I believe that repetitive, overhead work may lead to osteoarthritis of the glenohumeral joint.

2. Acromioclavicular joint.

Osteoarthritis can develop after an unreduced subluxation or dislocation, as well as after repetitive work requiring activities with the hands above shoulder level.

J. Shoulder-hand syndrome

This autonomic dystrophy is known to occur in 10 to 30% of patients having had a myocardial infarction, a stroke, or injury to the upper limb and hand. It is characterised by shoulder stiffness. This disorder may follow an injury, often trivial, such as a wrist fracture.

K. Neck problems and shoulder problems

There is no doubt that pain from cervical spine problems, in particular in instances of degenerative disc disease, can radiate to the shoulder. A good clinical examination will help to distinguish between symptoms originating in the shoulder and those referred to the shoulder. Discussion of cervical spine problems exceeds the limits of the discussion paper of the shoulder.

L. Value of certain examinations

a. MRI

As previously stated I believe that an MRI as well as ultrasound and a CT can give us the necessary information to reach an exact diagnosis.

b. Arthroscopy

Although, it is a valuable tool in confirming a diagnosis (diagnostic arthroscopy) it is rarely used for diagnostic purposes only, as imaging studies are very accurate in determining the diagnosis.

Therefore, since ultrasound, CT and MRI are non-invasive procedures they should be given preference.

Most surgical procedures involving rotator cuff, AC joint, and recurrent dislocation are done arthroscopically, after the diagnosis has been confirmed.

What can be expected after a debridement of the shoulder?

The most beneficial effect seems to be temporary reduction of pain and thus a better function. I do not think that the effect is long lasting, and this should rarely be done as a stand alone procedure. It may be associated with other procedures for impingement, rotator cuff, etc.

Additional information of the anatomic structures of the shoulder can be found in:

The CIBA Collection of Medical Illustrations

Volume 8

Musculoskeletal System Part 1
Anatomy, Physiology and Metabolic Disorders

Published by CIBA - GEIGY Corporation, 1987

Section 1:
Plates 27 and 28 (upper drawings only)
Plate 30
Plate 31

Gray's Anatomy

The articulations
Fig .169: showing the left shoulder
Fig.170: vertical sections through the shoulder joint

Additional References

1. Bernard BP 9 (ed): Musculoskeletal disorders and work place factors. Washington DC. DHHS (NIOSH) , publication No 97-141, 1997
2. Halpern M, Hurd JL, Zuckerman JD: Occupational shoulder disorders, In: The Shoulder, Rockwood CA, Matsen III FA, Wirth MA, Lippitt SB (eds), 4th edition. Philadelphia, Saunders, 2009, pp.1489-1508.
3. National Research Council: Musculoskeletal disorders and the workplace. Washington DC. National Academic Press 2001
4. Wells R: Task analysis. In: Chronic musculoskeletal injuries in the workplace. Ranney D (ed). Philadelphia WB Saunders. 1997 pp.41-63
5. World Health Organization: Identification and control of work-related diseases. Technical report 174. Geneva, World Health Organization 1985 pp.7-11