

THE SAN DIEGO KNEE CLINIC

THE SHOULDER

We will be offering counseling on diet and exercise. If interested, please contact my office and schedule a medically supervised *Health and Orthopedic Fitness* assessment appointment which will include a spine and joint health assessment evaluation. This assessment will not be covered by health insurance.

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The shoulder is a fascinating joint. Several muscles traverse the shoulder joint. These include the deltoid muscle, which is the large superficial, fleshy muscle best noted on the lateral, or outside, aspect of the shoulder. Deep under the deltoid muscle are the rotator cuff muscles which include (from front to back) the subscapularis, supraspinatus, infraspinatus, and teres minor. The long head of the biceps traverses the interior of the shoulder joint and helps supinate, or turn, the forearm in an outward direction. The biceps primarily functions more as a forearm muscle than a humeral muscle.

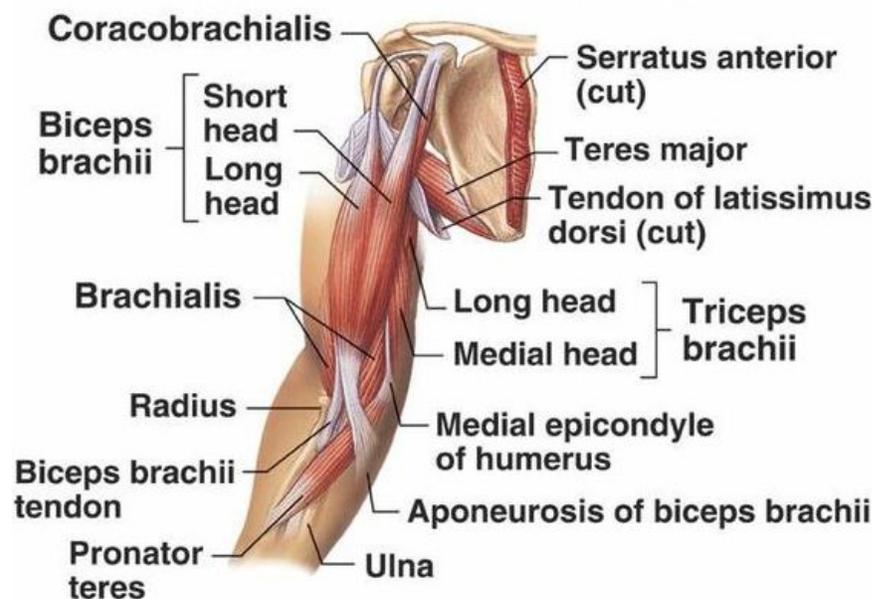


Figure 1.

The deltoid and rotator cuff muscles work in concert to control the motion of the shoulder. It is quite amazing to think that these muscles control the actual elevation of the arm and hand above the level of the head, fighting the forces of gravity. In order for the shoulder to function normally, the bony architecture and the shoulder muscles must work in concert to produce a normal painless range of motion at the shoulder. There are many shoulder conditions that can disrupt this delicate balance and control. The most common of these is termed “impingement syndrome” (Koester, 218).

IMPINGEMENT SYNDROME

This syndrome refers to an abnormal biomechanical relationship that has developed at the shoulder region. An impingement-type syndrome can occur in both the young and the older patient. There are congenital abnormalities about the shoulder that lead to problems at a younger age. The acromion, which is the bone at the end of the shoulder where the deltoid muscle inserts, is responsible for the upper stability of the shoulder region (Ellenbecker, 2009). The deltoid muscle inserts onto the acromion and works off the acromion to elevate the arm above the level of the head in all directions.

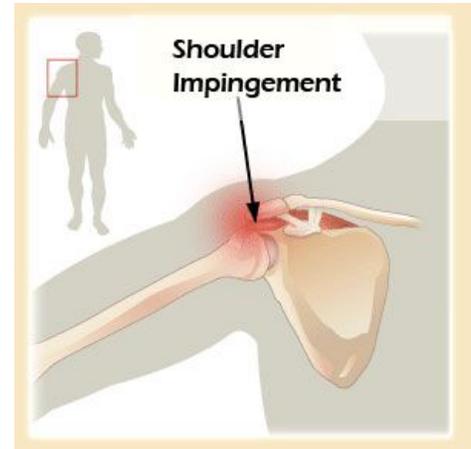


Figure 2.

However, the acromial bone can be congenitally or developmentally elongated in the front of the shoulder, especially when the patient forward flexes or takes the arm in front of him or her, and elevates it above the level of the head when the arm is lifted forward and the proximal aspect of the humerus (arm bone) comes in contact with the acromion. The rotator cuff muscles are interposed between the acromion and the humerus. In the forward-elevated or the side-elevated position, the supraspinatus is the main muscle-tendon that feels the impinging effect of the acromion once the arm is elevated in a forward or side direction (Escamilla, 2014).

BURSITIS AND TENDON TEARS

Over the years, the tendon of the supraspinatus can become affected by too much mechanical pressure. The tendon loses its blood supply and either pain or a tendon tear may develop. In addition, there is a sac called a “bursa” that lies between the acromion and the humeral head (Figure 3). This is referred to as the “subacromial bursa” (Roddy, 2014). Bursitis can develop initially through this impinging-type process with irritation of the bursa being caught between the acromial bone, the humeral head,

and the overlying supraspinatus tendon. The bicep tendon is also located in this region and can be affected as well. If the pain becomes too excessive, various degrees of disability are created.

MEDICATION AND PHYSICAL THERAPY

One usually proceeds—after being medically evaluated—with either a mild oral anti-inflammatory medication with rest and/or physical therapy. Generalized strengthening about the shoulder is needed to attempt to reposition the humeral head in the shoulder joint so that abnormal forces are not put directly on the painful areas.

The exercises recommended are basic exercises that circumferentially strengthen the shoulder muscles and pull the humeral head backward and, thus, decrease the pressure on the humeral head when the arm is elevated forward (Killian, 2012). Conservative management of the problem is usually successful in the initial stages.

DEGENERATIVE ARTHRITIS

However, as time goes by, if continued impingement occurs, then one will develop chronic pain with or without associated tendon tears (Figure 4). In addition, either post-traumatic degenerative arthritis or degenerative arthritis caused by aging affects the “AC joint,” which is located next to the shoulder joint. “AC” is an abbreviation for acromioclavicular. There is a “meniscus,” or cushion, between the acromion and clavicle. The cushion can be easily injured and, with time, degenerative arthritis due to

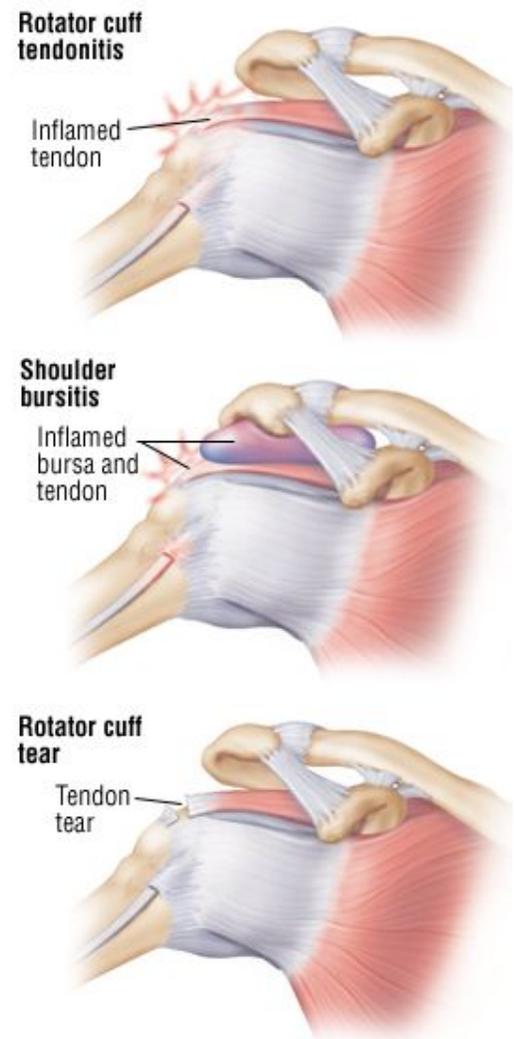


Figure 3.

injury of this particular joint, will occur (Mitchell, 2005). AC joint arthritis is a very common problem and is often associated with acromial impingement syndrome.

Studies performed in England have shown that with aging, the acromion actually increases in size in a forward direction with calcification of the coracoacromial ligament. This CA ligament is found in the front of the shoulder and, with calcification, can affect the forward positioning of the shoulder as one attempts to place the arm above the head.

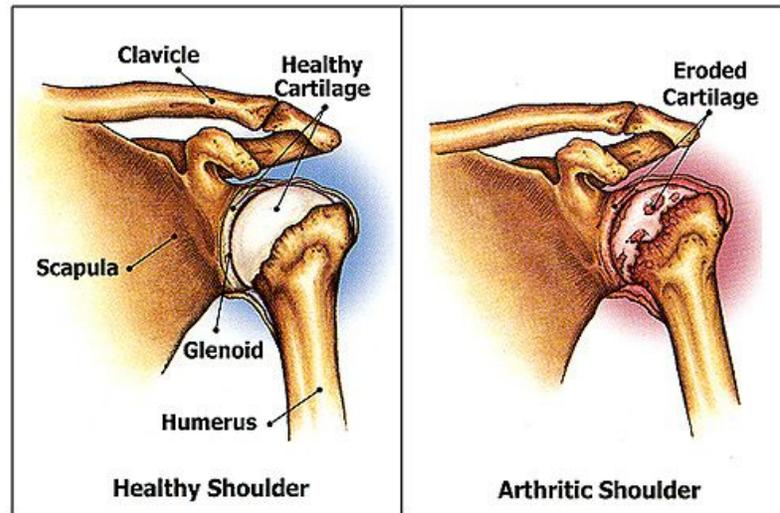


Figure 4.

ARTHROSCOPIC SURGERY PROCEDURES

At this time, if conservative management fails, the current medical philosophy regarding this problem dictates that the acromion must be reduced in size in the forward and/or the lateral, or outside, position. This is usually done arthroscopically. A small microscope is inserted into the subacromial region just below the acromial bone and the undersurface of the acromial is basically burred down to a smaller size. Additionally, this is also done in the front leading surface of the acromial bone. If there is any suspicion of pain emanating from the AC joint and/or bone spurs of significance, the end of the clavicle bone is removed (known as a Mumford procedure) either arthroscopically or through a small incision at the top of the shoulder. These procedures are performed to reduce and/or eliminate the patient's pain. The coracoacromial ligament is also either removed or transected to reduce any type of soft tissue impingement upon the front of the shoulder as well.

Surgery is performed to improve the biomechanics of the shoulder so that one can lift the arm with less or no pain while performing activities of daily living. There are also potential problems which emanate from the shoulder joint, which is referred to medically as the glenohumeral joint (Sheehan, 2013). Pathological problems of the shoulder joint can include several disorders. The most common disorders are:

LABRAL TEARS

The labrum is the structure inside the shoulder that is made of a soft tissue called fibrocartilage. The labrum functions as a “spacer” between the humerus and the glenoid within the shoulder joint (Mimori, 1999). There is a “suction” phenomena created by the meniscus within the shoulder joint that helps maintain shoulder stability. If the labrum is torn or disrupted, the suction phenomena decreases and a feeling of instability results. Physical therapy may help this condition.

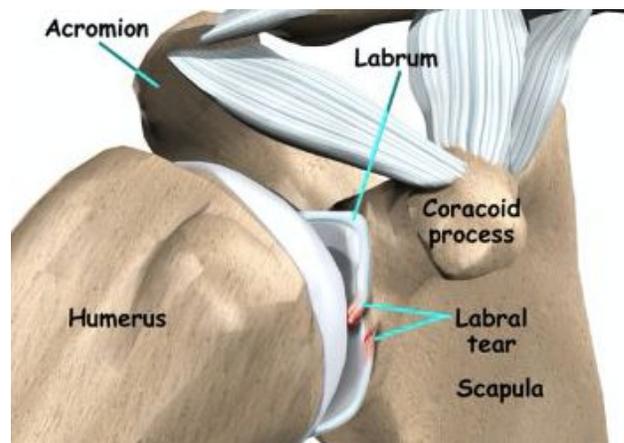


Figure 5.

However, it will not change the altered biomechanics of a tear at the labrum. If physical therapy and other conservative modalities fail, arthroscopy is performed. Arthroscopy will demonstrate the head and its location. Using small microscopic instruments, the torn region is excised. This does not restore complete normal functioning of the shoulder, but it does seem to be beneficial in terms of decreasing “catching” pain and the feeling of instability.

Shoulder Dislocation

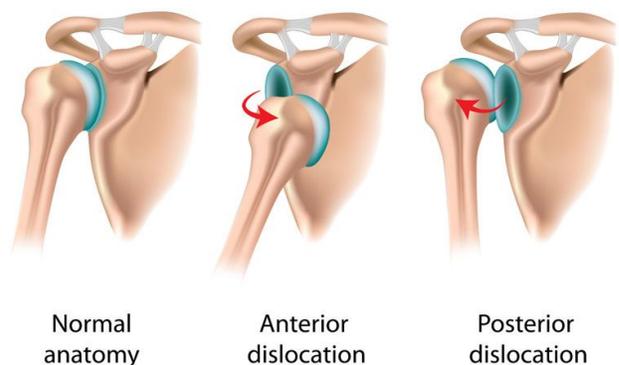


Figure. 6

LIGAMENTOUS INSTABILITY PROBLEMS

Another common shoulder problem, especially after a trauma, is ligament-related instability. Instability is usually the result of direct trauma to the shoulder. However, this is not true in all cases, as some people are born with very loose joints and have a condition referred to as “multidirectional instability,” which I will discuss later in this article.

The post-traumatic problems result from an abnormal force upon the shoulder that stretches the ligaments, either repetitively or acutely, to the point of rupture. When the ligaments are no longer functional about the shoulder, the term “instability” is used medically to describe the laxness or looseness of the joint (Levine, 2000). When the ligaments fail, the humeral head will dislocate or sublet from the joint, causing pain and, at times, an inability to move the shoulder. Conservative treatment includes physical therapy and strengthening of the shoulder.

However, if conservative measures fail to resolve the patient’s symptoms, then surgery is indicated.

Various reconstructive surgery techniques are available once the pathology is defined. The most difficult part of the shoulder instability question is to feel confident that one has ascertained the type of ligament instability which is involved. Obviously, the humeral head can dislocate in a 360° position. The most common type of instability is where the humeral head falls out of the glenohumeral joint in a forward and downward direction. Various tightening procedures referred to currently as “capsulorrhaphy,” which tighten the stretched ligaments, are performed for this condition. The results are quite successful in terms of controlling instability and returning the shoulder to near-normal functioning. Each mechanical problem at the shoulder associated with instability, such as a partial or full tear of the biceps tendon and/or impingement syndrome, decrease the probability of a return to normal functioning of the shoulder.

ROTATOR CUFF TEARS

Rotator cuff tears are very common at the shoulder and are associated with impingement-type syndromes and/or acute injuries (Hashimoto, 2003). When the rotator cuff is torn, generally this is a painful condition. Not all rotator cuff tears, however, require a surgical approach. After the initial tear of the tendons, the shoulder is usually painful. Minor tears will heal in time.

Physical therapy is often quite helpful. However, if all conservative modalities fail, and/or it is obvious that there has been a serious rupture of the rotator cuff, a surgical approach is indicated.

Current medical philosophy dictates that an arthroscopic evaluation is performed to assess the location of the rotator cuff tear. An MRI (Magnetic Resonance Imaging) and/or an arthrogram (dye study) is often performed prior to surgery to gain further information regarding the shoulder condition.

In treating rotator cuff tears, arthroscopic approaches are available, which are performed in concert with small incisions about the shoulder. Big tears are usually surgically corrected via a larger incision at the outside of the shoulder.

Small suture anchors, which are either metallic or plastic, are placed in the depths of the shoulder joint and are used as anchoring devices with sutures, which holds the tendon in a more normal anatomic position to allow healing (Cole, 2001). These techniques have been quite successful, whether performed arthroscopically or through larger incisions using a more direct, open technique. Suture anchors infrequently require removal. The open techniques are used for larger rotator cuff tears that are also associated with subacromial bursitis, advanced acromial bony irregularity with impingement, AC joint injury and arthritis, and/or coracoacromial ligament hypertrophy/calcification and impingement-type problems, which would also need to be addressed at the time of rotator cuff surgery.

INTRA-ARTICULAR BONY LOOSE BODIES

Intra-Articular bony loose bodies are noted at the time of a patient's initial x-rays in the office setting (Yiannakopoulos, 2007). These can be removed arthroscopically. Arthroscopy is the treatment of choice for any type of bony loose body within the shoulder joint.

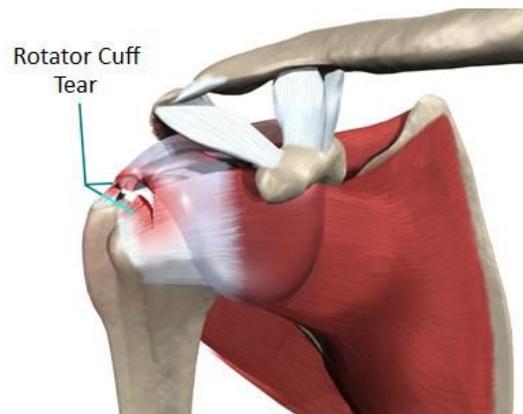


Figure 7.

NERVE PROBLEMS

Shoulder nerve problems are rare. However, they do occur, and the most common problem is referred to as the "suprascapular nerve impingement syndrome."

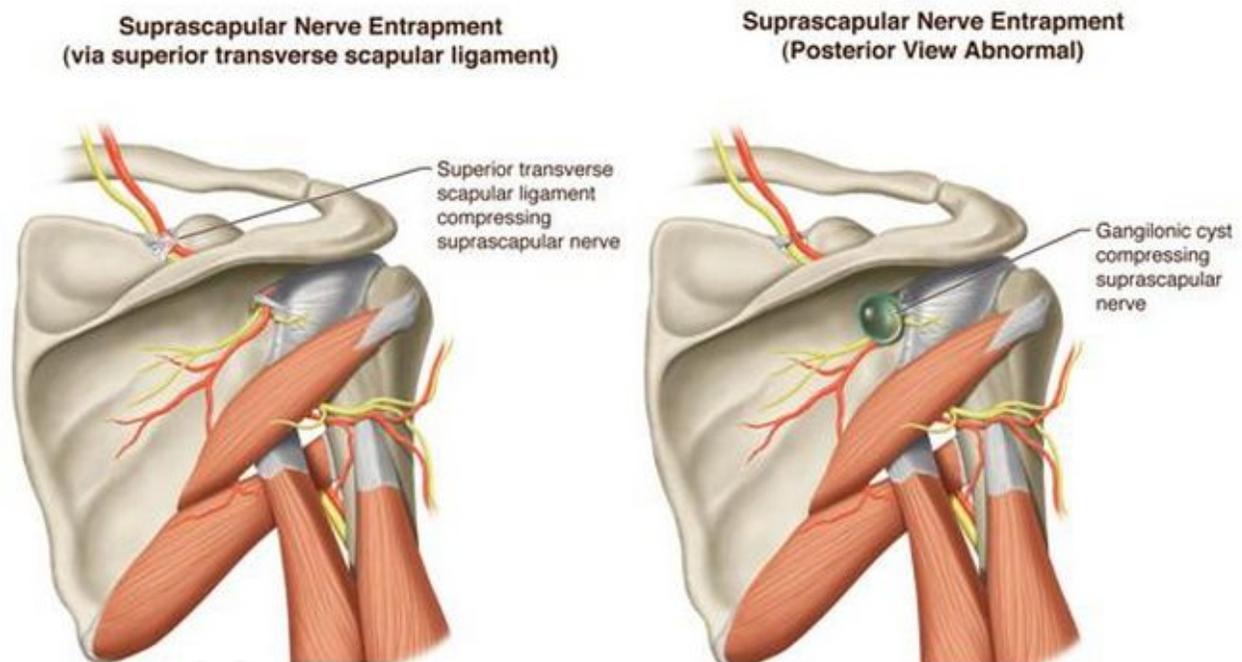


Figure 8.

The suprascapular nerve emanates from the front of the shoulder and traverses toward the back of the shoulder through a bony canal above the shoulder joint. There is a ligament above the nerve. The ligament can become hypertrophic and enlarged with time, thus “pinching” the nerve. Open surgery is performed and the ligament is released. If the syndrome is caught early enough, the patient’s symptoms will gradually improve with time. However, even surgery may not correct the problem adequately in the late stages, and will result in a permanently weak shoulder.

Please contact us if you have any questions regarding the above material. It is a basic approach to common shoulder problems.

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