



SHOULDER PAIN

Anatomy

Conditions: Muscular Spasm • Pinched Nerve • Rotator Cuff Tendonitis

Procedures: Subacromial, Glenohumeral and Acromioclavicular Injections • Nonprocedural Treatments

Surgery: Rotator Cuff Surgery



ANATOMY

The two main bones of the shoulder are the **humerus** and the **scapula** (shoulder blade). The joint cavity is cushioned by **articular cartilage** covering the head of the humerus and face of the glenoid.

The scapula extends up and around the shoulder joint at the rear to form a roof called the **acromion**, and around the shoulder joint at the front to form the **coracoid process**. The end of the scapula, called the **glenoid**, meets the head of the humerus to form a glenohumeral cavity that acts as a flexible **ball-and-socket joint**. The joint is stabilized by a ring of fibrous cartilage surrounding the glenoid called the **labrum**. **Ligaments** connect the bones of the shoulder, and **tendons** join the bones to surrounding muscles.

The **biceps tendon** attaches the biceps muscle to the shoulder and helps to stabilize the joint. Four short muscles originate on the scapula and pass around the shoulder where their tendons fuse together to form the **rotator cuff**. All of these components of your shoulder, along with the muscles of your upper body, work together to manage the stress your shoulder receives as you extend, flex, lift and throw.



CONDITIONS

Muscular Spasm

The muscles around the shoulder can tighten up as the result of trauma or underlying disease and result in a painful spasm. This is usually the component of pain which responds to massage and heat the best. Often there are several things going on at the same time which necessitate treatment. When the underlying condition causing the spasm is improved and treated, the spasm often resolves.

Spasm usually responds to MODALITIES, THERAPY, AND MEDICATIONS

Cervical Radiculopathy ['Pinched Nerve']

Degeneration of the spine can result in several different conditions that cause problems. These are usually divided between problems that come from mechanical problems in the neck and problems which come from nerves being irritated or pinched. A radiculopathy is a problem that results when a nerve in the back is irritated as it leaves the spinal canal. This condition usually occurs when a nerve root is being pinched by a herniated disc or a bone spur.

Symptoms: Weakness, Tingling sensations in the arm/shoulder, numbness and loss of reflexes may all occur. These symptoms may worsen when the neck is in different positions such as flexion and extension.



- C4 - C5 (C5 nerve root) - Can cause weakness in the deltoid muscle in the upper arm. Does not usually cause numbness or tingling. Can cause shoulder pain.
- C5 - C6 (C6 nerve root) - Can cause weakness in the biceps (muscles in the front of the upper arms) and wrist extensor muscles. Numbness and tingling along with pain can radiate to the thumb side of the hand. This is one of the most common levels for a cervical disc herniation to occur.
- C6 - C7 (C7 nerve root) - Can cause weakness in the triceps (muscles in the back of the upper arm and extending to the forearm) and the finger extensor muscles. Numbness and tingling along with pain can radiate down the triceps and into the middle finger. This is also one of the most common levels for a cervical disc herniation (see Figure 1).
- C7 - T1 (C8 nerve root) - Can cause weakness with handgrip. Numbness and tingling and pain can radiate down the arm to the little finger side of hand.

Diagnosis: It may be diagnosed by imaging, such as X-RAYS, MRI or CT. Testing such as EMG/NCS may also be performed to examine the 'electrical system' of the body and determine the severity of nerve compression. Treatment may consist of THERAPY, MODALITIES, INJECTIONS, MEDICATIONS or SURGERY

Rotator Cuff Tendonitis

WHAT IS THE ROTATOR CUFF IN THE SHOULDER?

The rotator cuff is a group of flat tendons which fuse together and surround the front, back, and top of the shoulder joint like a cuff on a shirt sleeve. These tendons are connected individually to short, but very important, muscles that originate from the scapula. When the muscles contract, they pull on the rotator cuff tendon, causing the shoulder to rotate upward, inward, or outward, hence the name "rotator cuff."

WHAT IS IMPINGEMENT SYNDROME?

The uppermost tendon of the rotator cuff, the supraspinatus tendon, passes beneath the bone on the top of the shoulder, called the acromion. In some people, the space between the undersurface of the acromion and the top of the humeral head is quite narrow. The rotator cuff tendon and the adherent bursa, or lubricating tissue, can therefore be pinched when the arm is raised into a forward position. With repetitive impingement, the tendons and bursa can become inflamed and swollen and cause the painful situation known as "chronic impingement syndrome."

HOW DOES IMPINGEMENT SYNDROME RELATE TO ROTATOR CUFF DISEASE?

When the rotator cuff tendon and its overlying bursa become inflamed and swollen with impingement syndrome, the tendon may begin to break down near its attachment on the humerus bone. With continued impingement, the tendon is progressively damaged, and finally, may tear completely away from the bone.

WHY DO SOME PEOPLE DEVELOP IMPINGEMENT AND ROTATOR CUFF DISEASE WHEN OTHERS DO NOT?

There are many factors that may predispose one person to impingement and rotator cuff problems. The most common is the shape and thickness of the acromion (the bone forming the roof of the shoulder). If the acromion has a bone spur on the front edge, it is more likely to impinge on the rotator cuff when the arm is elevated forward. Activities which involve forward elevation of the arm may put an individual at higher risk for rotator cuff injury. Sometimes the muscles of the shoulder may become imbalanced by injury or atrophy, and imbalance can cause the shoulder to move forward with certain activities which again may cause impingement.

OTHER THAN IMPINGEMENT, WHAT ELSE CAN CAUSE ROTATOR CUFF DAMAGE?



In young, athletic individuals, injury to the rotator cuff can occur with repetitive throwing, overhead racquet sports, or swimming. This type of injury results from repetitive stretching of the rotator cuff during the follow-through phase of the activity. The tear that occurs is not caused by impingement, but more by a joint imbalance. This may be associated with looseness in the front of the shoulder caused by a weakness in the supporting ligaments.

WHAT KIND OF SYMPTOMS DOES A PATIENT HAVE WHEN THE ROTATOR CUFF IS INJURED?

The most common complaint is aching located in the top and front of the shoulder, or on the outer side of the upper arm (deltoid area). The pain is usually increased when the arm is lifted to the overhead position. Frequently, the pain seems to be worse at night, and often interrupts sleep. Depending on the severity of the injury, there may also be weakness in the arm and, with some complete rotator cuff tears, the arm cannot be lifted in the forward or outward direction at all.

HOW IS THE DIAGNOSIS OF ROTATOR CUFF DISEASE PROVEN?

The diagnosis of rotator cuff tendon disease includes a careful history taken and reviewed by the physician, an x-ray to visualize the anatomy of the bones of the shoulder, specifically looking for acromial spur, and a physical examination. Atrophy may be present, along with weakness, if the rotator cuff tendons are injured, and special impingement tests can suggest that impingement syndrome is involved. An MRI (magnetic resonance imaging) scan frequently gives the final proof of the status of the rotator cuff tendon. Although none of these tests is guaranteed accurate, most rotator cuff injuries can be diagnosed using this combination of exams.

WHAT IS THE INITIAL TREATMENT FOR ROTATOR CUFF DISEASE AND IMPINGEMENT?

If minor impingement or rotator cuff tendinitis is diagnosed, a period of rest coupled with medicines taken by mouth, and physical therapy will frequently decrease the inflammation and restore the tone to the atrophied muscles. Activities causing the pain should be slowly resumed only when the pain is gone. Sometimes a cortisone injection into the bursal space above the rotator cuff tendon is helpful to relieve swelling and inflammation. Application of ice to the tender area three or four times a day for 15 minutes is also helpful.

WHAT IS THE SECOND LINE OF TREATMENT IF THE ROTATOR CUFF PAIN AND WEAKNESS PERSIST?

If there is a thickened acromion or acromial bone spur causing impingement, it can be removed with a burr using arthroscopic visualization. This procedure can often be performed on an outpatient basis, and at the same time, any minor damage and fraying to the rotator cuff tendon and scarred bursal tissue can be removed. Often this will completely cure the impingement and prevent progressive rotator cuff injury.

IF THE ROTATOR CUFF IS ALREADY TORN, WHAT ARE THE OPTIONS?

When the tendon of the rotator cuff has a complete tear, the tendon often must be repaired using surgical techniques. The choice of surgery, of course, depends on the severity of the symptoms, the health of the patient, and the functional requirements for that shoulder. In young working individuals, repair of the tendon is most often suggested. In some older individuals who do not require significant overhead lifting ability, surgical repair may not be as important. If chronic pain and disability are present at any age, consideration for repair of the rotator cuff should be given.

WHAT WILL HAPPEN IF THE ROTATOR CUFF IS NOT REPAIRED?

In some situations, the bursa overlying the rotator cuff may form a patch to close the defect in the tendon. Although this is not true tendon healing, it may decrease the pain to an acceptable level. If the tendon edges become fragmented and severely worn, and the muscle contracts and atrophies, repair at that point may not be possible. Sometimes in this situation, the only beneficial surgical procedure would be an arthroscopic operation to remove bone spurs and fragments of torn tissue that catch when the arm is rotated. This certainly will not restore normal power or strength to the shoulder, but often will relieve pain.

HOW IS A MAJOR INJURY TO THE ROTATOR CUFF TENDON REPAIRED SURGICALLY?



Read about Rotator Cuff Surgery in the Surgery section below.



PROCEDURES

Subacromial Injection

This injection helps alleviate some of the inflammatory pain in the fluid filled sac overlying the most commonly involved tendon in rotator cuff tendonitis. This technique can get rid of some of the pain, therefore making therapy more effective.

Glenohumeral Injection

This injection goes directly into the 'ball and socket' joint in the shoulder. It can help alleviate pain in patients with certain arthritic conditions.

Acromioclavicular Injection

A small amount of medication can be injected into the tiny joint on top of the shoulder. This pain may be due to arthritis conditions or from direct trauma with resulting inflammation.

Nonprocedural Treatments

PHYSICAL AND OCCUPATIONAL THERAPY

This type of therapy may consist of exercises to improve range of motion, strength and conditioning. A good therapist will examine you, assess your deficits and disease and formulate a plan based on optimizing function and minimizing pain. These exercises are specific for the nature of your injury and should be executed under the supervision of a physician who understands your case.

MODALITIES

Modalities include simple age-old treatments such as heat, cold and massage as well as newer treatment methods such as acupuncture, manipulation, and electrical stimulation. Your physician and therapists should formulate an optimal treatment protocol to maximize your healing potential. These modalities are often used in conjunction with Physical and Occupational therapy.

MEDICATIONS

Depending on the nature of your problem, Non-steroidal antiinflammatory drugs ['NSAIDS'], corticosteroids, and opioids [narcotic] medications may be used. If there is a muscular spasm, a muscle-relaxant may help alleviate that aspect of your pain. Narcotics should be minimized and used only for short periods if at all possible due to rapid tolerance and all the attendant risks associated with abuse of a controlled substance.





SURGERY

Dr. Sandhu performs minimally invasive surgeries which result in a rapid recovery and minimal risk to the patient. Although we do not perform large-scale open surgeries in our clinics, there are occasions where a problem requires surgical intervention.

We can help screen potential surgical candidates and send them for evaluation by the appropriate specialist. These surgeons are usually orthopedic surgeons or neurosurgeons with specialized training for the particular disease process involved.

Rotator Cuff Surgery

HOW IS A MAJOR INJURY TO THE ROTATOR CUFF TENDON REPAIRED SURGICALLY?

The arthroscope is extremely helpful when repairing rotator cuff tendons, but sometimes it is necessary to add a "mini-open" procedure if the tendon is completely torn. Using the arthroscope at the beginning of the case allows visualization of the interior of the joint to facilitate trimming and removal of fragments of torn cuff tendon and biceps tendon. The next step utilizes the arthroscope to visualize the spur and thickened ligament beneath the acromial bone, while they are removed with miniature cutting and grinding instruments. If it is necessary to suture a rotator cuff tear which has pulled off the bone, a two-inch incision can be made directly over the tear that has been visualized and localized using the arthroscope. The deltoid muscle fibers can be spread apart so that strong stitches can attach the rotator cuff tendon back to the bone. If the tear is minimally retracted, small suture screw anchors may be used arthroscopically or open.

HOW IS MY SHOULDER TREATED AFTER SURGERY?

In a minor operation for impingement, the shoulder is placed in a simple sling. If a full thickness tear of the rotator cuff was present and repaired, then the shoulder will be supported by a postoperative brace. The brace is very helpful because it will allow exercise of the elbow, wrist, and hand at all times, and places the arm in a position that promotes better blood circulation and relieves stress on the repaired rotator cuff tissues. In addition, the shoulder can be exercised in the brace much easier than when it is at the side in an immobilizer.

WHAT IS THE REHABILITATION PROGRAM AFTER ROTATOR CUFF SURGERY?

Depending on the type of surgery performed, the program will allow a period of time for healing of the soft tissues followed by time to regain range of motion and then strengthen the shoulder muscles, but particularly the rotator cuff. In minor tendinitis and impingement syndrome, the program takes approximately two to three months. If the rotator cuff tendon has been completely torn, it may take six months or more before the atrophied muscles can resume their function and the range of motion of the arm is restored. Frequently, pain relief is much quicker and return to daily activities is often possible by two to three months.

HOW SUCCESSFUL IS ROTATOR CUFF SURGERY?

Again, every case is unique. In the young, healthy person with a minor rotator cuff impingement, surgery is predictably successful. As the injury becomes more severe, such as with a large bone spur and fragmentation of the tendon, then a perfect result cannot be expected. Since it is necessary to trim back the unhealthy tendon before reattaching it to the bone, a decreased range of motion of the shoulder will often result. Despite this, pain relief and return of strength are usually well worth the minor decreased mobility. The final outcome often depends on the willingness and ability of an individual patient to work on their postoperative physical therapy program.