Rotator Cuff Injury (1/2)

The rotator cuff is the group of four muscles and tendons that surround the shoulder joint. The four muscles are called the supraspinatus, infraspinatus, subscapularis, and teres minor. The most common tendon to have a problem is the supraspinatus. On top of the rotator cuff is the deltoid muscle. The bones at the shoulder include the humerus, scapula (shoulder blade), and clavicle (collar bone). The rotator cuff muscles start on the shoulder blade and attach around the front, top, and back of the humerus. They help to elevate the arm away from the body in forward, side, and backward motions. They also turn the arm in or out to rotate the shoulder. These muscles and tendons provide strength and stability to the shoulder joint.

Above the rotator cuff there is a bursa - a sack of tissue that cushions and protects two surfaces so that they do not rub directly against each other when they move. The rotator cuff bursa protects close contact between bones around the shoulder (Figure 1). When the rotator cuff is injured or damaged, it can lead to inflammation of the bursa, called bursitis. Bursitis can cause pain and loss of motion.

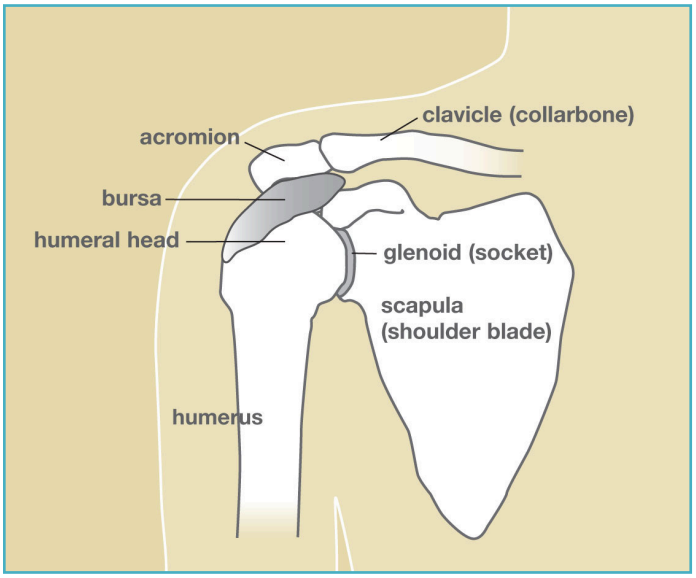

Figure 1: Shoulder anatomy, shown here, is important to understand with a rotator cuff injury.

Causes

Rotator cuff injuries can result from trauma (such as falls), sports injuries, or motor vehicle accidents. However, most rotator cuff injuries result from natural tendon aging and gradual breakdown of the cuff. Tendinosis is a process where the tendon develops microscopic changes in its collagen and cells without inflammation. In some people this process can cause symptoms. In other people, it may be occurring silently. Gradually, there are enough structural changes that it is easier to tear the weakened tendon doing an routine activity. They are more common in older people for this reason.

Signs and Symptoms

Damage to the rotator cuff is usually called a "tear." Tears can be small or large, and the size and location of the tear determines the symptoms. Symptoms can include:

- Pain
- Weakness
- Limited motion
- Catching
- Locking
- Feeling that the shoulder is not stable

The symptoms are usually worse in certain positions, such as:

- Reaching backward to fasten a seat belt
- Picking up an object out of the back seat
- Picking up a stack of plates out of a cupboard

Certain sports activities can worsen symptoms, including:

- Pitching
- Throwing
- Playing tennis or racquetball
- Weight lifting

But not all rotator cuff tears are painful. Many people with rotator cuff injuries have no symptoms. It is not well understood why some people feel nothing and others do.

Diagnosis

The first step to diagnosis is a history and exam by your doctor. It is important for the doctor to identify where your pain is coming from. He or she will do this by asking you about the quality and timing of your pain. Not all shoulder pain is related to a shoulder injury. Some shoulder pain comes from other places, such as the neck or even the heart.

If your doctor is concerned about a rotator cuff injury, he or she may order imaging tests. This might start with an x-ray. Although x-rays do not show the rotator cuff muscles, bursa, and tendons, they can diagnose problems with the bone spurs or arthritis of the shoulder. These bony problems may be the source of your pain or could be a cause of a rotator cuff tear.

If your doctor is concerned about a rotator cuff tear, the best way to diagnose it is to get an MRI. An MRI will show

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location and size of tears or inflammation. The MRI can determine how many tendons are affected. It can determine if there is tendinosis where there are changes in the way a tendon looks but the tendon is still connected. It can show if there is a partial or a complete tear. It can show if the tear is displaced and how far away the tendon is from the expected bone attachment site. It can show if the muscle looks normal or if it has been filled with fatty tissue. This information will help determine proper treatment.

Some surgeons will also recommend arthroscopy. Arthroscopy is a surgical procedure that allows the surgeon to use a small camera to see inside the shoulder joint.

Treatment

Treatment will depend on the location and size of the rotator cuff tear as well as how long ago it was torn. Treatment usually begins with non-surgical treatment. This includes altering your activities so you can use your shoulder in a safer, more comfortable way. Many patients benefit from physical therapy. Your therapist can help you improve mobility and strengthen your shoulder muscles. Anti-inflammatory medications and steroid injections (also known as a cortisone shot) directly into the shoulder can help with pain relief.

If these treatments fail, or the tear is very new, you may benefit from surgery. Arthroscopy, which uses a small camera and instruments, can be used to remove scar tissue, remove loose bodies, debride the tendon, remove inflamed joint lining, release tight tissue, and repair rotator cuff tears. In many cases it is helpful to identify a tear early after it occurs. They longer the tendon is detached from the bone, the harder it is to repair the tendon if surgery is indicated. It takes more work and force to move a displaced and shortened tendon back to where it is supposed to attach to the humerus. This can affect repair success. When the tendon is no longer attached to the bone, the muscle cannot lengthen. When the muscle remains shortened and does not see normal forces, it can lose its contraction ability and much of the muscle mass becomes filled by fatty tissue instead. When the muscle has irreversible changes it can no longer be repaired.

Secondary procedures may then be needed to help with pain. This will leave someone with weakness and loss of motion. What can be done if the patient desires better motion and strength, but they have a tendon that cannot be repaired? They may be a candidate for tendon transfer surgery. Tendon transfers borrow a working muscle and tendon and use them to replace the lost rotator cuff function. This means they no longer perform their original function, so there are some side effects. This works better than no treatment at all but is not as good as being able to repair the original injured tendon. This also needs a healthy joint cartilage.

Joint replacement surgery may be an option for those with shoulder arthritis and large tears that cannot be repaired.

Rehabilitation

Therapy is a critical part of recovery after rotator cuff surgery. Your therapy regimen will depend on which surgery you have. Therapy can last from three to 12 months. It may require special types of slings and supports to wear early after surgery. Many shoulder procedures can take several months to get back toward your normal lifestyle. A coordinated effort between the patient, surgeon and physical or occupational therapist is necessary for the best result.