

Rotator Cuff Tear

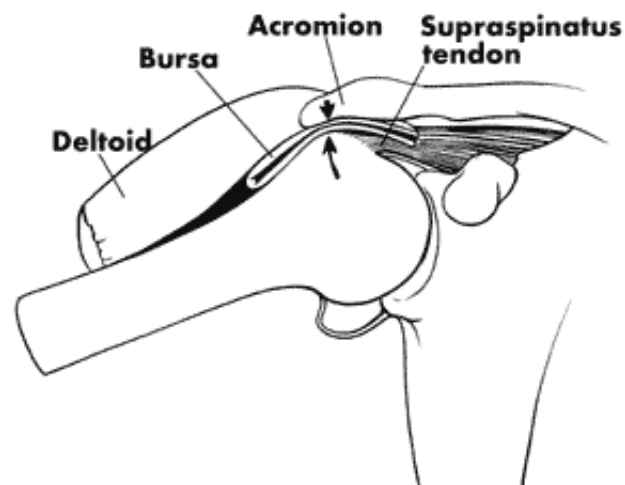
Introduction

The shoulder is a very elegant and complex piece of machinery. The design of the shoulder gives us the ability to do many useful things by allowing the shoulder to help us reach and use our hands in many different positions. This design gives the shoulder joint great range of motion but not much stability. As long as the parts of this elegant machine are in good working order, the shoulder can move freely and painlessly. The rotator cuff tendons are one of the key reasons that the shoulder is so useful. The tendons can be subject to a considerable amount of wear and tear, or degeneration, as we use our arms, especially overhead activities. This wear and tear can lead to weakening of the rotator cuff tendons, through a condition known as impingement. The rotator cuff tendons are also subject to degeneration as we age. An injury to these tendons can result in a weak painful, shoulder - due to tearing of the rotator cuff tendons. Let's look at how this can occur.

Anatomy

The shoulder is made up of three bones: the scapula (shoulder blade), the humerus (upper arm bone) and the clavicle (collarbone). The tendons of four muscles form the rotator cuff. The muscles are called the supraspinatus, infraspinatus, teres minor, and subscapularis.

Tendons attach muscles to bones. Muscles are able to move bones by pulling on these tendons. This large tendon called the rotator cuff connects the humerus with the scapula (shoulder blade) and helps raise and rotate the arm. As the arm is raised, the rotator cuff also keeps the humerus tightly in the socket (glenoid) of the scapula. The part of the scapula that makes up the roof of the shoulder is called the acromion. Between the acromion and the rotator cuff tendons there is a bursa. There are many bursae all over the body where tissues must move against one another. The bursa is a lubricated sac of tissue that protects the muscles and tendons as they move against one another. The bursa simply allows the moving parts to slide against one another without too much friction.



Causes

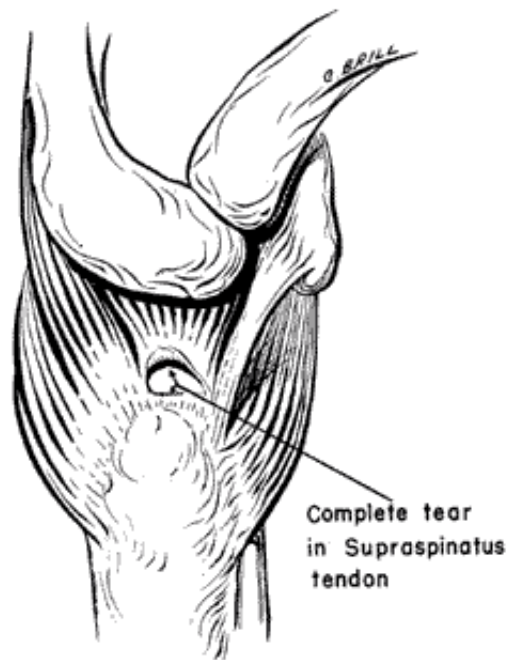
Many studies have shown that the rotator cuff tendons have areas where there is a very poor blood supply. In the human body, the better the blood supply a tissue has, the better and faster

that tissue can repair and maintain itself from day to day wear and tear. These areas of poor blood supply in the tendon make the rotator cuff tendons especially vulnerable to degeneration with aging. This simple condition of aging may help explain why the rotator cuff tear is such a fairly common injury in later life. Rotator cuff tears usually occur through areas of the tendon that were not normal to begin with and have been weakened by degeneration and impingement.

The weakened rotator cuff tendons can be injured, and torn, by an excessive force, such as trying to catch a falling heavy object, or lifting an extremely heavy object with the arm extended. This can occur even in a young person. Typically a rotator cuff tear occurs in a late middle-aged person who has been having problems with the shoulder for some time before the acute event. That person starts a lifting activity which exceeds the strength of the tendons, and the tendon tears acutely, leaving an inability to raise the arm. There may, or may not, be pain associated with the event.

Symptoms

Rotator cuff tears cause two main problems - pain and weakness. In some cases, a rotator cuff may be only a partial tear of the tendons, and you may have pain but can continue to move the arm in a normal range of motion. In other cases, a complete rupture of the tendons occurs, and you are unable to move the arm in a normal range of motion. A complete rotator cuff tear usually results in an inability to raise the arm away from the side under your own power.



Most rotator cuff tears cause a vague pain in the shoulder area, and may result in a "catching" sensation when the arm is moved. The larger the tear in the tendon, the more weakness there is when trying to move the arm. Most people report an inability to sleep on the affected side, due to pain.

Diagnosis

The physical examination can be very suggestive of a rotator cuff tear. A complete tear is usually very obvious. If your doctor can move the arm in a normal range of motion, but you are unable to move the arm using your own strength, there is a high likelihood of a tear in the tendons.

X-rays may give clues as to whether there is a rotator cuff tear, but a test called an arthrogram is usually required. This test is done by injecting dye into the shoulder joint and taking several X-rays. If the dye leaks out of the shoulder joint where it was placed, it suggests that there is a tear in the rotator cuff tendons where the dye leaked out.



The MRI Scan can also be used to actually look at the rotator cuff tendons and determine whether or not they are torn. An MRI scan is a special radiological test where magnetic waves are used to create pictures that look like slices of the shoulder. The MRI scan shows more than the bones of the shoulder. It can show the tendons as well, and whether there has been a tear in those tendons. The MRI scan is painless, and requires no needles or dye to be injected. The arthrogram is an older test. Both tests are still widely used.

Treatment

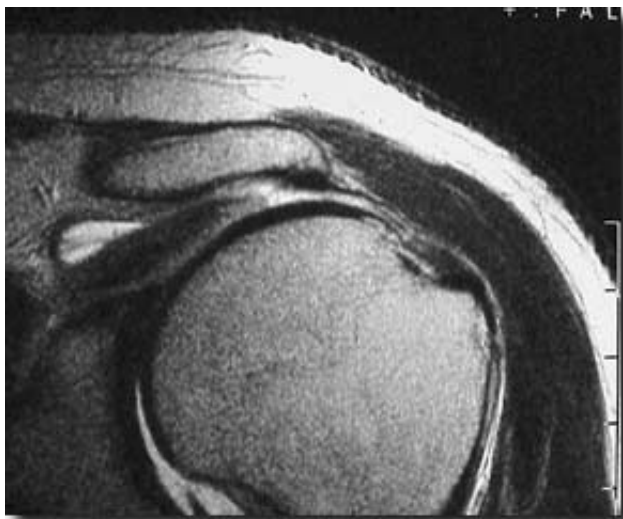
Initial treatment for a suspected rotator cuff tear is rest and anti-inflammatory medication, mainly to control pain. While a true rotator cuff tear will not heal, some partial tears will become very tolerable and may not require a surgical repair. As soon as pain tolerance permits, physical therapy to regain motion is begun.

A cortisone injection may be suggested if you are still having pain after several weeks of conservative care. After a reasonable time, if the pain is not tolerable or the motion of the arm is not acceptable, an arthrogram or MRI scan may be suggested to plan for surgery.

Surgery to repair a tear in the rotator cuff tendons is usually necessary if there is a complete tear in the tendons resulting in an inability to raise the arm. Surgery may also be necessary for a partial tear of the tendons - if the tear results in more discomfort and weakness than you are willing to tolerate. The timing of surgery is variable. In a complete tear of the rotator cuff, there is evidence to suggest that repairing the tendons within 3 months of the injury results in a better outcome.

Repairing the tendons can be difficult. The surgery is usually done through a 3 small arthroscopic incisions, depending upon the size and shape of the tear. Larger retracted tears will require mobilization. In the case of a massive retracted rotator cuff tear a 2-4 inch incision on the side of the shoulder may be necessary. In the case of a massive tear the repair may need reinforcement with the use of a graft material such as a "Graft Jacket" patch. In the most cases, repairing the tendons involves first removing any degenerative rotator cuff tissue that does not appear healthy.

Then, an area of the humerus (the upper arm bone) where the tendon was torn from is prepared for reattachment of the tendon. The soft tissue is removed on an area of the humerus to form a raw bony area for attachment of the torn tendon. Drill holes are made in the humerus to allow suture bone anchors to be secured in the bone to attach the tendon. The tear in the tendon is then sewn together. Other sutures are used to attach the tendons to the bone of the the humerus securing the bone anchors in the previously made drill holes. The tendon heals to the bone over time and reattaches itself.



Following surgery you most likely will be able to go home. However, on occasion, you may spend one or two nights in the hospital. There is a trend towards smaller incisions for repair of the rotator cuff tendons, and in some cases repair with the aid of the arthroscope. If your are a candidate for this type of repair, you may go home the same day.

Expect to begin physical therapy fairly soon after surgery. The repair must be protected, mainly to keep the sutures from pulling free, but early range of motion exercises will lead to a quicker recovery. The use of a CPM (continuous passive motion machine) and cold compress therapy will speed up the mobilization. During the period three to six weeks following surgery, the therapist will begin more active exercises to begin regaining the strength in the rotator cuff muscles. Recovery from shoulder surgery can be a slow process. Getting the shoulder moving as fast as possible is important, but this must be balanced with the need to protect the healing muscles and tissues. You can expect the process of recovery to take several months.

As mentioned earlier, a rotator cuff tear does not usually occur in a normal shoulder. Most shoulders which have suffered a rotator cuff tear have other problems as well. The same problems that caused the rotator cuff tear have most likely affected the rest of the shoulder. These can include acromioclavicular (AC) joint arthrosis and impingement syndrome. When surgery is suggested, the surgical procedure may have to address these conditions as well.

Finally, not all rotator cuff tears are repairable. Sometimes, the tendon has been torn for too long a period of time. This can lead to the tendon and muscle contracting. The muscle and tendon cannot be stretched enough to be attached back to where it was torn from. In other cases, the tendon tissue has simply worn away, and what tendon remains is not strong enough to hold the stitches necessary to attach the tendon to bone. In these cases the use of a "Graft Jacket" patch can be

helpful. In these circumstances, simply removing all the torn tissue and fixing any other problems in the shoulder (such as acromioclavicular (AC) joint arthrosis and impingement syndrome) may reduce your pain. It will probably not increase the strength or motion of the shoulder. It may actually decrease the motion.

If all of these attempts to improve your shoulder fail to give you a useable shoulder, there are other more complex and involved procedures that include tendon grafts and muscle transfers. These are rarely necessary but will be discussed with you by your doctor if necessary.