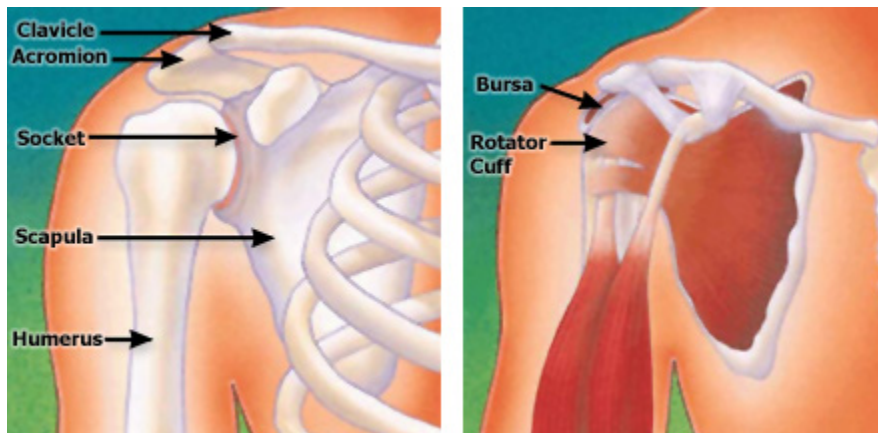


Rotator Cuff Tears

The rotator cuff is the network of four muscles and several tendons that form a covering around the top of the upper arm bone (humerus). These muscles form a cover around the head of the humerus. The rotator cuff holds the humerus in place in the shoulder joint and enables the arm to rotate.

Rotator cuff tear is a common cause of pain and disability among adults. Most tears occur in the supraspinatus muscle, but other parts of the cuff may be involved.



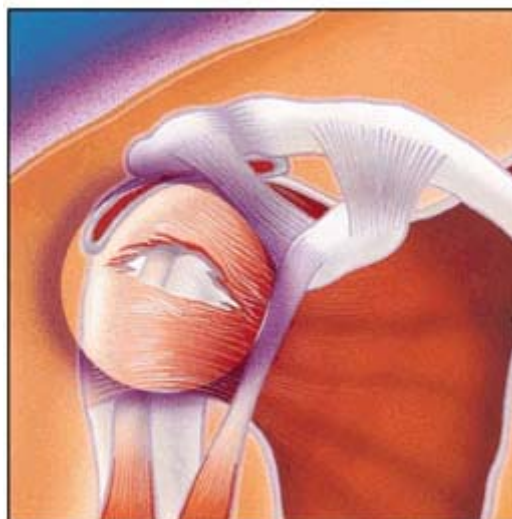
The rotator cuff covers the head of the humerus and stabilizes the shoulder joint.

Anatomy

The rotator cuff helps to lift and rotate the arm and to stabilize the ball of the shoulder within the joint. The rotator cuff is made up of four muscles and their tendons. These combine to form a "cuff" over the upper end of the arm (head of the humerus).

The four muscles of the cuff (supraspinatus, infraspinatus, subscapularis, and teres minor muscles) are attached to the scapula on the back through a single tendon unit. The unit is attached on the side and front of the shoulder on the greater tuberosity of the humerus.

Cause



A tear can occur within the muscle.

The rotator cuff can be torn from a single traumatic injury. Patients often report recurrent shoulder pain for several months and a specific injury that triggered the onset of the pain. A cuff tear may also happen at the same time as another injury to the shoulder, such as a fracture or dislocation.

Most tears, however, are the result of overuse of these muscles and tendons over a period of years. People who are especially at risk for overuse are those who engage in repetitive overhead motions. These include participants in sports such as baseball, tennis, weight lifting, and rowing.

Rotator cuff tears are most common in people who are over the age of 40. Younger people tend to have rotator cuff tears following acute trauma or repetitive overhead work or sports activity.

Rotator cuff tear may often happen as a result of wear and tear.

Symptoms

Some of the signs of a rotator cuff tear include:

- Atrophy or thinning of the muscles about the shoulder
- Pain when lifting the arm
- Pain when lowering the arm from a fully raised position
- Weakness when lifting or rotating the arm
- Crepitus or crackling sensation when moving the shoulder in certain positions

Symptoms of a rotator cuff tear may develop right away after a trauma, such as a lifting injury or a fall on the affected arm. When the tear occurs with an injury, there may be sudden acute pain, a snapping sensation and an immediate weakness of the arm. Symptoms may also develop gradually with repetitive overhead activity or following long-term wear. Pain in the front of the shoulder radiates down the side of the arm. At first, the pain may be mild and only present with overhead activities, such as reaching or lifting. It may be relieved by over-the-counter medication such as aspirin or ibuprofen.

Over time the pain may become noticeable at rest or with no activity at all. There may be pain when lying on the affected side and at night.

Diagnosis

Diagnosis of a rotator cuff tear is based on the symptoms and physical examination. X-rays, and imaging studies, such as MRI (magnetic resonance imaging) or ultrasound, are also helpful.

Your doctor will examine the shoulder to see whether it is tender in any area or whether there is a deformity. He or she will measure the range of motion of the shoulder in several different directions and will test the strength of the arm. The doctor will also check for instability or other problems with the shoulder joint.



Magnetic resonance image shows a full-thickness rotator cuff tear within the tendon.

The doctor may also examine the neck to make sure that the pain is not coming from a " pinched nerve " in the cervical spine and to rule out other conditions, such as osteoarthritis or rheumatoid arthritis.

Plain X-rays of a shoulder with a rotator cuff tear are usually normal or show a small spur. For this reason, the doctor may order an additional study, such as an ultrasound or MRI. These can better visualize soft tissue structures such as the rotator cuff tendon.

An MRI can sometimes tell how large the tear is, as well as its location within the tendon itself or where the tendon attaches to bone.

Nonsurgical Options

In many instances, nonsurgical treatment can provide pain relief and can improve the function of the shoulder.

Nonsurgical treatment options may include:

- Rest and limited overhead activity
- Use of a sling
- Anti-inflammatory medication
- Steroid injection
- Strengthening exercise and physical therapy

Surgical Treatment

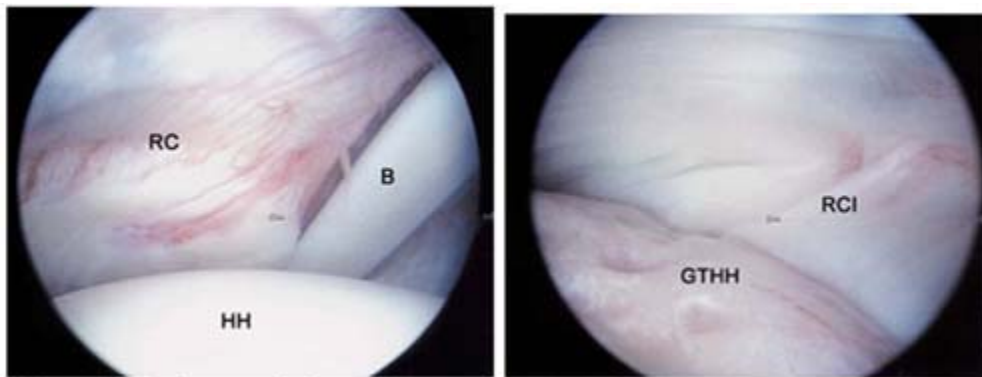
Your orthopaedic surgeon may recommend surgery if

- Nonsurgical treatment does not relieve symptoms
- The tear has just occurred and is very painful
- The tear is in the shoulder of the dominant arm of an active person
- If maximum strength in the arm is needed for overhead work or sports

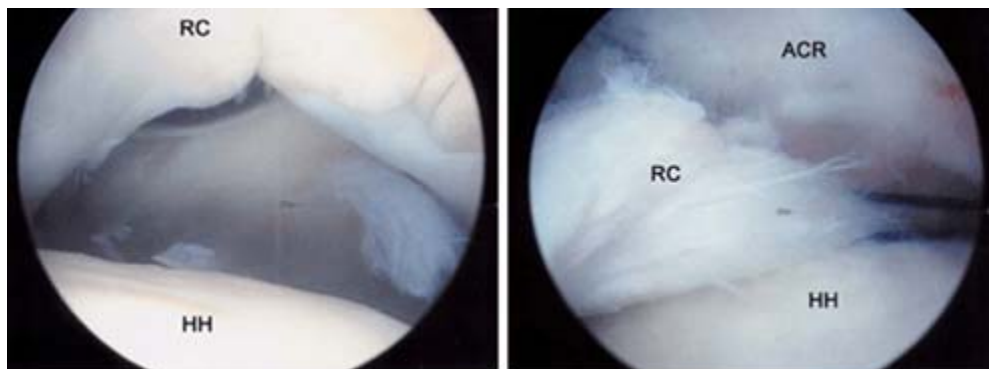
The type of surgery performed depends on the size, shape, and location of the tear. A partial tear may require only a trimming or smoothing procedure, called a " debridement. " A complete tear within the thickest part of the tendon is repaired by suturing the two sides of the tendon back together. If the tendon is torn away from where it inserts into the bone of the arm (humerus), it is repaired directly to bone.

Many surgical repairs can be done on an outpatient basis.

In the operating room, your surgeon may remove part of the front portion of the scapula, the acromion as part of the procedure. The acromion is thought to cause " impingement " on the tendon. This may lead to a tear. Other conditions such as arthritis of the AC joint or tearing of the biceps tendon may also be addressed.



Left, Arthroscopic view of the rotator cuff from within the joint shows the rotator cuff (RC), the head of the humerus (HH), and the biceps tendon (B).



Left, Arthroscopic view of rotator cuff tear. A large gap can be seen between the edge of the rotator cuff and humeral head.

In general, three approaches are available for surgical repair. These include:

- **Arthroscopic Repair.** A fiberoptic scope and small, pencil-sized instruments are inserted through small incisions instead of a large incision. The arthroscope is connected to a television monitor and the surgeon can perform the repair under video control.
- **Mini-Open Repair.** Newer techniques and instruments allow surgeons to perform a complete rotator cuff repair through a small incision, typically 4 cm to 6 cm.
- **Open Surgical Repair.** A traditional open surgical incision is often required if the tear is large or complex or if additional reconstruction, such as a tendon transfer, has to be done. In some severe cases, where arthritis has developed, one option is to replace the shoulder joint.

Rehabilitation

After surgery, the arm is immobilized to allow the tear to heal. The length of immobilization depends upon the severity of the tear. An exercise program will help regain motion and strength in the shoulder. This program begins with passive motion and advances to active and resistive exercises. Complete recovery may take several months.

- A strong commitment to rehabilitation is important to achieve a good surgical outcome. The doctor will examine the outcome to advise when it is safe to return to overhead work and sports activity.

Research on the Horizon

Future developments in the treatment of rotator cuff disease include newer arthroscopic surgical techniques. These allow for smaller, less painful incisions and a faster recovery time.

Many techniques now use dissolvable anchors. These hold stitches in place or hold stitches in bone until the repair has healed. They are gradually absorbed by the body.

Research is also being done on " orthobiologic " tissue implants. These promote growth of new tissue in the body, and help with the healing process.

Last reviewed and updated: October 2007

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