

## Treating Rotator Cuff Tears – Arthroscopic Approach Offers Improved Outcomes

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It's a common occurrence. An elderly patient complains of shoulder pain that keeps her awake at night. A tennis player can't move his arm without incurring pain from the shoulder right down the arm.



Rotator cuff disease represents a continuum of pathology affecting the shoulder's four tendons that envelop the humeral head — the supraspinatus superiorly, the infraspinatus and teres minor posteriorly, and the subscapularis anteriorly. Injuries and diagnoses can range from impingement syndrome to full-thickness rotator cuff tears. These injuries most commonly affect the elderly, but younger and more active patients, such as heavy laborers or athletes, are also susceptible.

The bony anatomy of the shoulder joint consists of a fairly shallow glenohumeral joint, which doesn't provide much bony support for stability. Therefore, the ligaments and rotator cuff tendons must provide most of the stability and motion for the shoulder joint. Most rotator cuff pathology involves the supraspinatus tendon superiorly. The supraspinatus is bounded by the humeral head inferiorly and a fixed coracoacromial arch superiorly. A tissue called the bursa lies between the supraspinatus tendon and the bony acromion at the roof of the coracoacromial arch. The supraspinatus is subject to not only intratendinous stresses with repetitive motion but also to abrasive forces as it travels under the bursa and the coracoacromial arch.

### **Rotator Cuff Injuries**

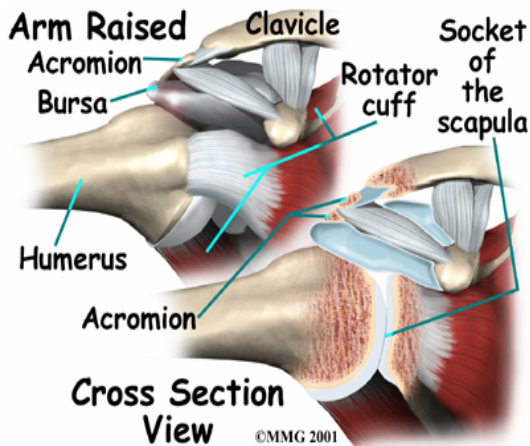
Impingement syndrome is an inflammation of the subacromial bursa and the rotator cuff — essentially, bursitis and tendonitis, respectively. There is a component of tendon overload to impingement syndrome causing tendonitis and a component of subacromial abrasion of the tendon with repetitive trauma. While impingement syndrome is most often caused by repetitive lifting at shoulder level or above, a single traumatic injury can also inflame the rotator cuff tendon and cause inflammation of the bursa.

This often happens because of a fall at work or from lifting a heavy object, which causes an eccentric load to the rotator cuff. If the inflammation in the bursa and rotator cuff continues with repetitive loads, the bursa may thicken, making even less room for the rotator cuff and causing even more mechanical abrasion to the rotator cuff. Repetitive overload of rotator cuff tissue and incidents of trauma can also cause the rotator cuff to tear. Age-related tendon degeneration also plays a common role in rotator cuff tears.

Rotator cuff tears are classified as partial-thickness tears or full-thickness tears. With a partial-thickness tear, the rotator cuff is still attached to bone, and only a part of the tendon is torn. Oftentimes, these tears have strong healing potential. With a full-thickness tear, the rotator cuff is detached from the bone, usually at the supraspinatus tendon. These do not have healing potential because the rotator cuff cannot reattach itself to bone without surgical fixation. However, surgical treatment is not always required. Some patients find they can live with rotator cuff tears and maintain good function with minimal pain.

## Evaluating the Patient

To evaluate a patient for rotator cuff disease, physicians should conduct a thorough history on the mechanism of any trauma and the nature of the pain. Most often, rotator cuff disease causes pain down the lateral aspect of the arm, sometimes radiating down to the elbow. These patients usually complain of arm pain rather than shoulder pain. Reaching out or above shoulder level will often exacerbate the pain.



Patients may also complain of occasional night pain. Night pain is often the reason these patients come into the office, blaming poor sleep patterns. Any weakness present is usually secondary to the pain. On physical examination, certain maneuvers called impingement signs are used to elicit pain in the rotator cuff area.

Pain with active elevation of the arm at about 90 degrees is consistent with rotator cuff tears. These patients typically have some stiffness, but in general, the arm is still easily elevated above shoulder level. Severe stiffness with less than 90 degrees elevation or abduction is more consistent with frozen-shoulder syndrome than with rotator cuff injury.

Radiologic evaluation of a painful shoulder includes anteroposterior (AP) axillary lateral and scapular Y-view x-rays to assess whether arthritis is present in the glenohumeral joint. The acromioclavicular (AC) joint is viewed to check for osteolysis, narrowing, and bone spurs. In viewing the morphology of the acromion, the physician can also look for spurs, the shape of the acromion, and the width of the subacromial space. Severe narrowing of the subacromial space with superior migration of the humerus on the glenoid indicates a massive and often irreparable rotator cuff tear.

A magnetic resonance imaging (MRI) scan is another excellent tool for diagnosing rotator cuff tears. A MRI is particularly useful in younger athletes and heavy laborers to rule out a rotator cuff tear before treatment. With elderly patients, a trial of conservative care is often attempted prior to ordering a MRI scan, as this patient population can usually still live well with a full-thickness rotator cuff tear.

## Conservative Treatment

If the patient is diagnosed with impingement syndrome without a significant rotator cuff tear, treatment begins with a trial of conservative care for approximately two to three months. This includes light duty work or sporting activities and avoiding work at shoulder level or above and any painful movements in sports. Nonsteroidal, anti-inflammatory medications are often prescribed to control inflammation. Cortisone injections can also play an important role in reducing inflammation, controlling pain, and allowing for a more aggressive physical therapy plan.

One goal of physical therapy is to improve the patient's range of motion. Injured shoulders are usually tight in elevation and internal rotation. Strengthening the rotator cuff is important, and it can take several months to see results. Chronic pain often leads to weak rotator cuff muscles and, consequently, poor shoulder mechanics. As part of their treatment, patients should also receive education on the proper mechanics of shoulder movement. This can include lifting mechanics for the laborer or proper throwing mechanics for the athlete. Strengthening the core muscles as well as the lower extremities is important in taking pressure off the shoulder when lifting or throwing.

## **Surgical Treatment Options**

Surgery is indicated for treatment of impingement syndrome when, after two to three months of conservative care, the patient has pain and loss of function that interferes with sleep and the activities of work and daily living. Surgical treatment includes a diagnostic arthroscopy to examine the entire joint surface, to rule out chondral injuries, and to check the articular and bursal sides of the rotator cuff to rule out a tear. The biceps tendon is also viewed to rule out a superior labrum anterior to posterior (SLAP) lesion or biceps tendon tear.

Once a diagnostic arthroscopy is performed, the main portion of impingement surgery is to perform a subacromial decompression. This includes arthroscopic excision of any thickened bursal tissue existing between the supraspinatus and the acromion, excising subacromial bone spurs, and flattening and smoothing the undersurface of the acromion to make more room for the rotator cuff. Also, any other pathology is addressed, such as performing a distal clavicle excision in the case of AC joint abnormalities or the debridement of a torn rotator cuff in the case of a partial rotator cuff tear not requiring fixation.

When a rotator cuff tear fails to heal with conservative care, the next step is surgical treatment consisting of diagnostic arthroscopy and subacromial decompression, followed by repair of the rotator cuff. While the traditional method for repairing a rotator cuff is the open approach of detaching the deltoid from the acromion and performing the entire surgery in an open fashion, arthroscopic techniques are now changing the way these tears are treated.

An increasingly popular method is to perform the diagnostic arthroscopy and the subacromial decompression through an arthroscopic approach, and then repair the rotator cuff in a mini-open approach with a small deltoid split requiring no deltoid detachment. Many surgeons are also choosing to perform the entire surgery with arthroscopic methods, including repair of the rotator cuff. In the short term, mini-open arthroscopic techniques reduce postoperative pain and facilitate a prompt recovery of motion.

## **Recovery and Results**

The results of impingement surgery and rotator cuff repairs are excellent. More than 90 percent of patients experience pain relief, excellent function, and a return to their daily activities.

However, a heavy laborer may not be able to return to the same line of work if it requires extensive and repetitive lifting above shoulder level, and an athlete may have restored function in daily activities yet find it difficult to return to sports activities that involve throwing. The severity of rotator cuff trauma directly relates to the severity of shoulder trauma and the age of the patient.

No matter which method is employed to repair the rotator cuff, the limiting factor in returning the patient to full activity is the healing of the rotator cuff tendon to bone. On average, a patient can expect approximately three months of healing time for the rotator cuff to attach solidly to bone and should limit active strengthening in elevation and abduction until that time. Total recovery time for rotator cuff repair is around five to six months. At this point, patients are most often back to full activity.