Shoulder Problems - Rotator Cuff Tear

Questions and Answers

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What is the rotator cuff, or rotator cuff tendon?

Tendons are thick cord-like structures that connect muscle to bone. The rotator cuff is made up of a group of four tendons that blend together to help stabilize and move the shoulder. The fibers of the rotator cuff bend as the shoulder changes position. The cuff can wear with repetitive motion and weaken with advancing age. X-rays do not show the rotator cuff. An MRI or ultrasound is often used to assess the condition of the rotator cuff and other soft tissues.

Figure 1. Rotator cuff tendons bend with arm rotation. (S.Lippitt, M.D., illustrator)

Figure 2. MRI of a right shoulder showing a full thickness rotator cuff (supraspinatus) tear.
How is the rotator cuff torn?

A tear of the rotator cuff may occur gradually over time or suddenly with an acute injury. Because the rotator cuff is very strong, a major force is required to tear the tissues. In contrast, degenerative cuff tissue that has gradually weakened over a long period of time can be torn easily. The initial tear may start out small and then extend to involve more and more of the rotator cuff. The diagram shows a small tear of the rotator cuff attachment. As shown, this tear can enlarge with extension. The tear may involve one or more of the four cuff tendons.

How do I know if I have a rotator cuff tear?

Rotator cuff tears are a common cause of shoulder pain and weakness. Patients with large rotator cuff defects may have difficulty raising their arm or rotating it out to the side. Sometimes cuff tears produce no symptoms. Other shoulder problems such as roughness, bone spurs, and stiffness may accompany rotator cuff tears. These problems may need to be addressed during the course of treatment.

Should I have surgery?

Shoulder surgery is not a procedure that has to be done immediately. The decision to have surgery is based on several considerations. In many cases, surgery may improve the weakness or pain from a rotator cuff tear. Surgery should be done when symptoms interfere with shoulder function, nonoperative management has been considered, and you are prepared to participate in the comprehensive postoperative physical therapy program. The amount of improvement is not only determined by the surgery, but also by your underlying condition and rehabilitation effort. When a rotator cuff tear has resulted from an acute injury, prompt surgery may optimize the quality of the result. In any case, rotator cuff surgery may improve your shoulder, but it cannot make the joint normal.

Is the tendon always reparable?

In many cases, tendon repair is possible. However, sometimes the tendon is too thin or pulled (retracted) too far back from its attachment site to permit a repair. In these situations, the removal of inflammation, scar tissue, and bone spurs (if these are present) helps diminish pain. If the tendon cannot be repaired, overhead use does not return
to normal.

What happens to my shoulder if surgery is not performed?

Once the tendon tears, the condition of your shoulder rarely improves without surgery. Most often, the pain increases and the movement and strength decrease. Fortunately, this occurs slowly over time.

What is the purpose of the surgery?

Rotator cuff surgery may involve repairing the torn rotator cuff by suturing the torn ends to their normal place of attachment to the bone. In some situations, the tear is so large or so retracted that the tendon cannot be repaired. In these cases, the tear edges are debrided (smoothed) to decrease inflammation and improve motion. You should expect a slow, gentle rehabilitation after your operation. In may take many months before your shoulder has achieved maximal improvement.

Are there any other options?

There are other available treatments including no treatment or "just living with it", continued physical therapy, medications, or injections. Any of these treatment options may be successful, but these usually do not work reliably, especially once the tendon has torn completely.

How do I prepare for surgery?

Rotator cuff surgery is not an emergency. You should be in the best possible condition for this procedure. Smoking should be stopped before the procedure and not resumed for 3 months afterwards, as smoking interferes with tendon healing. Any infection may be a reason to delay the operation. Some medications may need to be modified or stopped before surgery. For example, aspirin and anti-inflammatory medications may affect the way your blood clots.

Immediately after rotator cuff surgery, your arm may be less useful that it is now. This will require special planning to manage the activities of daily living during the period of recovery. You should not drive for at least four to six weeks after surgery. Time is required for the tendon at its attachment to bone to strengthen after surgery. Maximum strength may not be reached for six months. Even after repair, the tendon may remain at risk from heavy lifting, falls, and jerky movements.

How is the surgery performed?

At surgery, rotator cuff repair is performed if enough tissue of good quality is available. Surgical repair of a rotator cuff defect reestablishes the connection between the torn tendon and bone. If the tendon heals securely and durably to the bone, the force of the muscle can be effectively transmitted from the muscle to the arm. When a rotator cuff tear is recent and a significant force was required to tear the tendon, the chances of regaining shoulder strength by rotator cuff surgery are very good.

Conversely, when the defect is long-standing, large, or occurred without major injury, the quality and quantity of tissue available for repair may be insufficient for direct repair of the tendon edge to the bone. Under these circumstances, it may be necessary to smooth the moving surfaces, clean up the frayed edges of the tendon, and leave all or part of the defect unrepaired. In either case, the goal of surgery is to provide a smooth bearing surface between the rotator cuff and the subacromial arch, which overlies it.
In most cases, surgery is begun with an arthroscopic evaluation of the glenohumeral joint. An arthroscope is inserted through a small slit-like incision in the back of the shoulder. This allows a thorough evaluation of your joint and can identify other shoulder pathology that may be contributing to your symptoms. A second small incision is made in the front of the shoulder through which other instruments may be passed to assist with the evaluation. The arthroscope is then placed between the rotator cuff and the subacromial space to evaluate the rotator cuff. A portion of the smoothing is performed arthroscopically, which may include the removal of a small amount of bone from the undersurface of the acromion. The rotator cuff tear is evaluated for tear size, geometry, retraction, and quality. Reparability of the tear can often be established using this method. If the rotator cuff tendon is torn only partially (partial thickness tear), it is repaired or smoothed depending on the depth of the tear.

If the rotator cuff is reparable or additional smoothing is needed, a skin incision at the top part of the shoulder is made. Access to the rotator cuff is gained by splitting the upper part of the deltoid muscle. This incision allows access to the rotator cuff tendon without damaging the important deltoid muscle that is responsible for a significant portion of your shoulder's power. We call this the "deltoid-on" approach.

The torn edges of the tendon are then anchored to a groove in the bone in a way that leaves a smooth upper surface. Occasionally, you might be able to feel the sutures glide under the deltoid as you move the shoulder; that sensation resolves with time. The figure illustrates the method in which sutures are placed through the torn edge of the rotator cuff tendon and attached into a groove in the humerus. Sometimes, small absorbable or metallic bone screws (suture anchors) are inserted into bone. Sutures attached to these anchors facilitate the repair of tendon to
If the tendon has retracted and will not reach to its normal bony attachment site, a tissue releasing technique may help bridge the defect. If sufficient quality and quantity of tendon is not available, repair is not performed and the shoulder is smoothed as mentioned earlier to improve comfort and function.

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What kind of anesthesia is used?

Since this type of surgery cannot be done with local anesthesia, general anesthesia is used which allows the physician to work deep inside your shoulder. Before you go to sleep or immediately following the surgery, the anesthesiologist will give you a special type of injection called a regional block. A type of novocaine that may last for 8 to 16 hours is injected around the nerve that goes to the shoulder. This will help decrease the pain after the surgery.

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What is it like when I wake up?

At the conclusion of surgery, a gauze dressing will be taped to your shoulder. A drain may be placed to allow any excess fluids from around your shoulder to be removed. This will be removed once the drainage has minimized. Following surgery, you will awaken in the recovery room with your arm in a sling. An ice pack will be on top of your shoulder to control pain and swelling. The use of this ice pack, called a Cryo Cuff, may nor may not be covered by the particular health insurance plan you have selected, so you should check with your insurance company.

In the hospital, pain management will consist primarily of the regional block, which should keep the shoulder sufficiently numb for the first 8 to 16 hours after surgery and only minimal pain medications are needed. Oral narcotic pain medications are started as the feeling returns. Sometimes, intravenous narcotic medications are required; these may be given on an as-needed basis or using a PCA (Patient Controlled Analgesia) or Pain Pump device. Nothing can eliminate the pain following surgery completely, but medication and the ice pack will control it so that you will be as comfortable as possible.

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How long will I stay in the hospital?

You will enter the hospital in the morning, have the surgery, and stay in the recovery room 2-3 hours until you recover. You will then be taken to a hospital room and stay in the hospital overnight. The main reason is to make sure no medical complications develop and to make sure the critical phase of physical therapy and exercise is started that will eventually allow your shoulder to recover. Most patients go home the next morning.

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Will I need to wear a brace?

No. It is important to recognize that until it is well healed, even the best surgical repair is too weak to allow the muscle to actively raise the arm from the side. However, leaving the arm in a sling will make the shoulder permanently stiff. You will be provided with a sling at the conclusion of surgery, but it is to be worn only as needed.
to protect the shoulder. It is important to remove the sling often to perform range of motion exercises that prevent the shoulder from becoming stiff. The sling should also be removed for bathing and dressing.

**What are the potential complications?**

Potential complications include but are not limited to:

- Infection
- Wound problems (swelling, bleeding, delayed healing, unsightly or painful scar)
- Injury to nerves and blood vessels
- Fracture
- Pain, weakness, stiffness or instability of the joint
- Re-tear of the tendon
- Requirement for additional surgery
- General anesthesia risks
- Loosening or irritation of bone screws

**How successful is surgery?**

This surgery is successful in the vast majority of patients, about 90%. No shoulder operation is completely successful in every individual, but this procedure is reliable and will help restore the potential function in your shoulder. The operation is most successful at relieving pain. What is harder to accomplish is the return to vigorous overhead use of the arm in work and/or sports. Whether you can return to your previous level is an individual matter and depends on the damage to your shoulder, how well it heals, how well you rehabilitate the shoulder, and how strenuous is your desired level of work or sports.

**When can I return to routine activities after surgery?**

You will be able to use your fingers, wrist and elbow immediately after surgery. You may walk with assistance as soon as you have recovered sufficiently from anesthesia. If you live alone it may be helpful to have someone stay with you for the first day or two. You may shower or bathe with regular soap and water 24 hours after surgery. Some patients find it helpful to put a plastic stool or chair in the shower for a day or two. Remember that you are doing everything with one hand. You may walk outdoors, write, cook, and drive a car (automatic shift) within a few days. Connecting the seat belt is awkward. Take your time and move slowly. You might consider practicing this a few times before surgery with your bad arm in your lap. Do not lift more than 1-2 pounds with your operated arm.

**When can I return to work after surgery?**

For most sedentary jobs, you may be able to return to work within a day or two. When you return to work, you should not do any lifting, pushing, pulling, or carrying or raise your arm without help for 6 weeks. This allows the tendon to heal in the best possible position. You should have a sling with you at work and can use it when your arm feels tired or for protection. Further instruction in the proper use of your arm will be given to you before you leave the hospital.

You may begin light duty work involving no lifting, pushing, pulling or carrying more than 1-2 pounds, 6-8 weeks after surgery; you may work at waist level and lift 5-10 pounds, 3-4 months after surgery. Return to heavy lifting or overhead use may require 6-12 months.
How is my shoulder rehabilitated?

Rehabilitation includes:

- A home exercise program, instituted and monitored by a physical therapist.
- Avoidance of using the muscles in the repaired shoulder to lift or rotate the arm for the first few weeks postoperatively.
- Active-assisted motion exercises (5-10 minutes at a time, 3-4 times a day) beginning the first day after surgery, in which the opposite hand assists in lifting the arm up and out to the side as shown in the figure:

![Figure 8. Forward elevation stretch. This is performed active-assisted using the other arm for assistance. (S.Lippitt, M.D., illustrator)](image1)

![Figure 9. External rotation stretch performed using a cane and assistance with the other arm. (S.Lippitt, M.D., illustrator)](image2)

- Use of a continuous passive motion (CPM) machine to gently move the shoulder in order to prevent scar tissue formation. This begins in the hospital and continues at home for 2 weeks (30-90 minutes a session, 4 times a day).
- Evaluation by the physician 2 weeks after surgery to determine what type of exercises will be initiated.
- Sling for 6 weeks postoperatively for comfort and protection only.
- Strengthening exercises beginning 3 months postoperatively.