

## Biceps Repair Surgery (Ruptures, Tears, Subluxation, Tenodesis, Tenotomy)

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### Biceps Tendonitis, Partial Biceps Tears, Biceps Subluxation, Biceps Rupture, and Biceps Tenodesis

One of the more common complaints about the shoulder is biceps tendonitis. The biceps muscle starts at the elbow, passes up the arm and splits into two tendons or "heads". The shorter tendon ends at the coracoid process of the "shoulder blade" (the scapula) and the longer one enters the shoulder joint. There, the longer end (the "long head") attaches to the top of the socket (the glenoid) at a cartilaginous lip that covers the edge of the socket (the labrum). It is in the bicipital groove just as the tendon enters the shoulder that the long head tends to get most worn and inflamed. This is the primary location for biceps tendonitis, partial tears and ruptures.

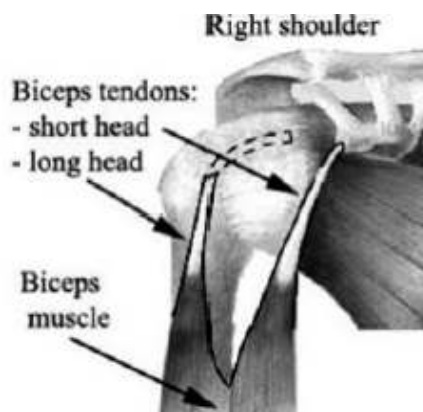
Crossing the shoulder joint and the elbow joint is the long head of the biceps, (whose true function in the shoulder joint is debated in the orthopedic and sports medicine community.) At the elbow it acts, partnered with the short head of the biceps, in flexion of the elbow and with supination of the hand (clockwise rotation of the right hand and counter-clockwise on the left).

When it does occur, **biceps tendonitis** can range from a mild self limited case to a chronic problem or even an acute rupture. A problem with the biceps tendon typically involves a partial or complete tear of the long tendon, inflammation around the tendon or involvement of the tendon, the nearby bursa (bursitis) and the rotator cuff.

**Complete ruptures** of the long head of the biceps are more common after the age of forty. Many times it is associated with an acute injury or a painful pop. Then, the muscle attached to the long head tends to ball up further down the arm. It often looks like a "Popeye" arm. The short head almost always remains intact. Many patients often have a long history of inflammation of the tendon (chronic biceps tendonitis) before the injury. When that occurs, the tendon failure is usually due to years of wear and tear on the shoulder. It is often associated with repetitive overhead lifting, chronic inflammatory tendonitis and a heavy lifting injury, or repetitive work trauma.

In other cases, a more severe sudden traumatic injury is the cause. This is more common in younger patients but can occur at any age. A traumatic torn biceps sometimes occurs during heavy weightlifting or from actions that cause a sudden load on the upper arm, such as a hard fall with the arm outstretched during competitive sports. Forced extension of the elbow against

resistance or a fall in a position that forces the tendon to trap between the humeral head (ball of the shoulder) and the sharper bone edges of the scapula or acromion can also cause a tear or rupture. The long head of the biceps can be also injured by repetitive motion, local trauma, rapid extension of the arm, force applied while trying to actively flex the elbow or during a fracture or dislocation of the shoulder. About 50% of long head of the biceps tendon ruptures are associated with rotator cuff tears (mostly supraspinatus tears). Subluxation of the long head is associated with a subscapularis tear. If there are signs and symptoms associated with a rotator cuff tear found on examination, further testing may be needed. When a patient has significant symptoms, an MRI is frequently required to make the diagnosis of additional shoulder problems associated with a rupture of the long head of the biceps.



**Please note:** Tears of the biceps tendon at the elbow are a completely different problem. Both heads of the biceps muscle join and attach in one common location on the proximal radius. Together, they are a major flexor of the elbow and these tears should, in general, always be repaired. The discussion here is focused on injuries to the long head of the biceps only.

**Treatment:** Biceps tendonitis is the most common problem seen in the long head of the biceps. It can often be treated with anti-inflammatories, ice and rest. In chronic cases, injection, NSAIDs and/or therapy may be needed. Many partial and even complete tears can be treated without surgery. A well performed physical exam by an orthopedic surgeon and an X-ray of the shoulder are often the best ways to see what treatment is most appropriate and rule out other problems with the shoulder. Occasionally there is a structural issue, and tenolysis (release of the tendon sheath), an arthroscopic decompression of the shoulder or a tendonotomy (release of the tendon itself) or tenodesis (removing the diseased segment of tendon and moving the tendon to a new location that preserves function while relieving the pain) may be required.

Surgery is often reserved for patients with evidence of other concomitant shoulder problems. When the long head of the biceps is completely torn, the acute soreness will resolve in weeks.



Some patients actually feel better than before the injury. If the muscle itself is painful with activity, the shoulder needs to be examined. If patients have weakness and pain with supination of the hand (clockwise rotation of the right hand and counter-clockwise on the left), after failing conservative measures, a biceps tenodesis may be required. Laborers that use screw drivers frequently at work with the injured arm may notice the deficit after a rupture and may require a tenodesis. Biceps ruptures are also frequently associated with bone spurs near the tendon's path into the shoulder joint. When these are painful they should be removed. If an MRI confirms the rotator cuff is torn, it should be repaired at the same time.

**Special considerations:** When the biceps is subluxated (out of its normal groove) and the subscapularis is torn, releasing the tendon and tenodesis may be necessary to protect the subscapularis repair. When there is a tear of the superior labrum (a cartilage lip on the socket of the shoulder joint) and it involves the attachment of the biceps, repair of the labrum (lip) is needed, and a release of the tendon or tenodesis may also help resolve the symptoms (this is a newer concept and there is no clear agreement on the best treatment at this time). Chronic partial tears with pain that have failed other treatment may also benefit from a tendotomy or a tenodesis. Your surgeon will have to take all these factors into account and make a judgment on what would be best for you based on the findings at the time of surgery.

When needed, a **Biceps tenodesis** is a surgical procedure that anchors the ruptured end of the biceps tendon to the upper end of the humerus. Dr. Reznik performs arthroscopic evaluation of the shoulder to check for other related injuries to the shoulder first. Once any rotator cuff issues are treated, if a tenodesis is needed, it is done through small incisions over the front of the humerus. Depending on the length and condition of the tendon, the location of the tenodesis will vary. Newer arthroscopic tendon transfers are also possible in some cases. The type of procedure will depend on your anatomy and the problem found at the time of surgery. When tenodesis is performed, the tendon itself can be fixed in place with a special absorbable screw, sutures, special suture anchors or a combination of these methods. The surgery is done on an outpatient basis with the goal of decreasing pain with activity and improving overall function in the affected arm.



Fig 1: An Intra-articular view (inside the ball and socket of the shoulder) of a normal biceps tendon.



Fig 2: An inside view of a torn biceps tendon. See the torn end facing the camera head on.



Fig 3: The tendon delivered out of a small incision.



Fig 4: Sutures placed for the repair.

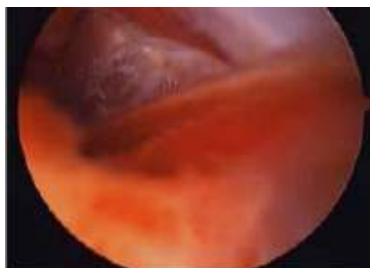


Fig 5: Tendon reattached to the bone in a new location. 5-23-09 AMR

**Biceps Tenotomy:** In some cases, the biceps is partially torn and painful. The tendon is swollen, worn, frayed or inflamed in its groove. Forward flexion of the arm, supination of the hand and pressing on (palpating) the bicipital groove is painful. If the non-dominant arm is involved, the patient has a low demand occupation and the shape of the muscle (cosmetic appearance) is not a concern, a tenotomy (a release of the tendon) as opposed to tenodesis (moving the tendon to a new location) can be an excellent option with good pain relief and a shorter recovery time.

## Post-Operative Instructions after a Biceps Tenodesis

**Day 1: The Day of Surgery:** Maintain dressing, adding 4x4 bandages if needed for drainage through the dressing. Use ice pack for 20 minute periods throughout today. (Do not place ice



directly on skin to avoid frostbite.) Keep pillow sling on at all times. Move fingers and wrist often. Expect some swelling, if you have any change in skin color or sensation in arm, notify our office. You will begin simple exercises the day of surgery. They should be done every day for the first week post-op, to maintain blood flow and help prevent blood clots.

Hand Squeezing and Wrist range of motion exercises tonight. (See exercise list) The arm sling must remain on at all other times, including bedtime.

When sleeping, most patients find that sleeping in a semi-upright position in a recliner or propped up on pillows on a couch is much more comfortable than trying to lie in bed for the first few weeks after shoulder surgery. I do not recommend trying to sleep in bed for at least the first 2 weeks.

**Day 2:** The Day after Surgery: Same as Day 1

**Day 3:** Starting about 48 hours after surgery: Continue same activities, including using ice for 20 minute periods as needed. You should remove your dressing. You may remove the sling to shower today, supporting the affected arm with the opposite hand. You may wash the skin around the incisions. When washing the under arm, do not use a large amount of soap. It may dry out the skin and cause a rash. After a short shower, dry the shoulder well and place Band-aids over incisions. Some of the prep solutions are yellow in color do not be surprised if it will not come off with soap and water. Sometimes only nail polish remover works.

**Day 3- 4:** Start Therapy with a physical therapist: This is to help avoid a frozen shoulder. The range of motion will be limited at first and the exact rehab protocol will depend on the status of your rotator cuff. The size and type of any associated rotator cuff tear will alter the rehab program. You should not do any resisted elbow flexion exercises for at least six weeks post op. You can do additional exercise only as the therapist instructs. Do not try to speed the process by doing more than asked because you can risk disrupting the repair. This may sound funny, but you cannot fool Mother Nature or when you are not moving the way you should, Dr. Reznik. Overdoing it, not following the directions and “creative” mistakes become obvious very quickly. To avoid complications, follow the therapy guidelines and keep all your postoperative follow-up appointments with your physician. These appointments are required to monitor your progress.

**Physical Therapy:** Physical Therapy is vital to your recovery of good shoulder function. It will include a graduated activity and exercise program to increase muscle strength and motion while protecting the repair. Your physical therapy will begin 3-4 days after surgery. The physical therapist will guide you in your shoulder rehabilitation program. It is very important for you to start therapy when recommended. To avoid complications, postoperative follow up appointments with your physician are also required to monitor your progress.



## General Instructions for all Rotator Cuff Repair and Biceps Tenodesis Patients

**Diet:** You may resume a regular diet when you return home. Most patients start with tea or broth, adding crackers or toast, then a non-spicy sandwich. If you become nauseated, check to see if one of your medications is upsetting your stomach, most narcotics can. If your stomach feels acidy, try Tums, Zantac or Pepcid AC to settle your stomach and drink plenty of clear liquids.

**Pain Control:** Take medication as prescribed by Dr Reznik. Please call our office with any questions regarding your medication. Take with food to avoid stomach upset. After surgery, some patients will see some swelling. Use an ice pack over the dressing throughout the first 24 hours after surgery and then for 20 minute periods as needed for comfort and to reduce swelling.

**Dressing:** The dressing is to remain clean and dry. After 48 hours you may remove the dressing and the yellow Xeroform gauze strips (the small yellow tapes). You may then shower with the dressings off. Pat the incisions dry, using care not to rub the scabs off and then cover each incision with a plain Band-Aid. Do not use creams or ointments on the incisions. This delays early scab formation and healing.

**Sling:** Patients are to wear the pillow sling at all times (including while at sleep) for 3 weeks. Move fingers and wrist often. Expect some swelling. Use Ice pack for 20 minute periods throughout the first 24 hours after surgery and then as needed. After the first three weeks, patients should wear the sling (with the pillow removed) when going outside of their home for the following 3 weeks completing a total of 6 weeks of sling use. This will help to alert others of your surgery. The sling will remind them it is not healed yet and help them avoid the affected arm during this healing period.

**Lungs:** After surgery you are encouraged to deep breathe and cough frequently (at least 3-4 times per day). This will reduce mucous from building up in your lungs and will reduce the risk of developing a post anesthetic pneumonia.

**Blood Clots:** Patients at high risk for blood clots include:

- Those with long car or train commutes or planning any air travel (these trips should be avoided in the first 6 weeks post op)
- May be overweight: BMI>30\*
- Have a history of having cancer
- Females on birth control pills
- Males over the age of 40



These patients should be taking 1 aspirin per day for 6 weeks after surgery unless allergic to aspirin.

\*BMI (or Body Mass index) is a number calculated from a person's weight and height. BMI provides a reliable indicator of body composition. A muscle/fat ratio if you will. The index is used to screen for weight categories that may lead to health problems.

**Call the physician or go to the ER if:**

- You develop excessive, prolonged nausea or vomiting
- You develop a fever above 101.5
- You develop any type of rash
- You experience calf pain

**Dental Work:** You cannot have any routine dental work (including cleaning) for at least 3 months after your surgery, or you risk infecting the suture anchors. After 3 months, you may see the dentist, but for one year from date of surgery, you will need to take antibiotics before and after dental work. If emergency dental work is needed call our office for a prescription.

**Driving:** Patients cannot drive until they are off all pain medications, completely out of the sling, and can easily place hands at 12 o'clock position of the steering wheel and can move hands freely from the 9:00 – 3:00 position.

**Airline Flights:** Patients may fly 3 weeks after surgery on short flights (up to 2 hours) only and should wait 6-8 weeks for longer flights. You should get up and walk frequently

**Call the Physician or go to the ER if:**

\*You develop excessive, prolonged nausea or vomiting

\*You develop a fever above 101.5

\*You develop any type of rash.

\*You experience calf pain. to avoid blood clots and take an aspirin (unless allergic).

You cannot carry any luggage for 3-4 months with the operated arm.

**Returning to Work:** Those patients with low demand work (no lifting) may be able to return to work within 3 weeks. They will still have restrictions on lifting, repetitive and overhead use. Patients with higher demand jobs or repetitive arm use need at least 6 weeks off. Any heavy labor with overhead lifting can require at least 4-6 months before returning to work, they still may have restrictions up to one year.



## **Exercises - Do three times each day as directed**

### **Starting Day 1:**

Hand Squeezes or Grip Strengthening: Using a small soft rubber ball or soft sponge, squeeze your hand. When in the shower, you can use a sponge filled with water. Do this for 3-5 sets of 10-20 repetitions each day. If this is too easy, later in the rehab course you can use a grip strengthener.

Wrist Range of Motion: Roll your wrist in circles for 30 seconds after each round of grip exercises.

### **Day 3 add:**

Elbow Range of Motion: Turning your palm inward, towards your stomach, flex and extend the elbow as comfort allows. This will decrease pain and prevent elbow stiffness.

### **Day 4 add:**

Pendulum Exercise: Holding the side of a table with your good arm, bend over at the waist, and let the affected arm hang down. Swing the arm back and forth like a pendulum. Then swing in small circles and slowly make them larger. Do this for a minute or two at a time, rest, then repeat for a total of 5 minutes, 3 times per day.

### **Not before Day 7-10 add:**

Wall Walking: Stand facing a blank wall with your feet about 12 inches away. "Walk" the fingers of the affected hand up the wall as high as comfort allows. Mark the spot and try to go higher next time. Do at least 10 repetitions, 3 times per day. When more comfortable and stronger (not before three weeks) do these exercises sideways, with the affected side facing the wall. Do not let the hand drop down from the wall- walk your fingers down as well as up. Dropping the arm will strain the repair and be painful. If having weakness on the way down, feel free to use the other arm to help.

Biceps Curls: Those patients with a tenodesis cannot do any biceps curls while the tendon heals. They can start moving the elbow without resistance in a limited range in the first 3 weeks; increase the range between 3-6 weeks, leading to full range after 6 weeks, but no resistive exercises for at least 3 months. To monitor your progress and avoid complications after surgery, it is important to keep your postoperative follow up appointments with Dr. Reznik and your physical therapist.

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