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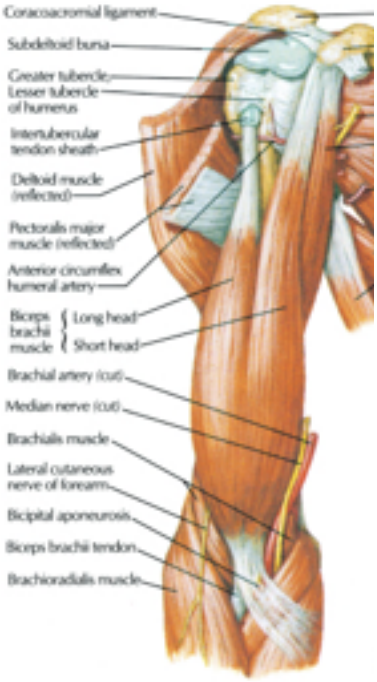
Distal Biceps tendon rupture

A distal biceps rupture occurs when the tendon attaching the biceps muscle to the elbow is torn from the bone. This injury occurs mainly in middle-aged men during heavy work or lifting. A distal biceps rupture is rare compared to ruptures where the top of the biceps connects at the shoulder. Distal biceps ruptures make up only three percent of all biceps tendon ruptures.



Anatomy

The biceps muscle goes from the shoulder to the elbow on the front of the upper arm. Tendons attach muscles to bone. Two separate tendons connect the upper part of the biceps muscle to the shoulder. One tendon connects the lower end of the biceps to the elbow.
The lower biceps tendon is called the distal biceps tendon. The word distal means that the tendon is further down the arm. The upper two tendons of the biceps are called the proximal biceps tendons, because they are closer to the top of the arm.

The distal biceps tendon attaches to a small bump on the radius bone of the forearm. This small bony bump is called the radial tuberosity. The radius is the smaller of the two bones between the elbow and the wrist that make up the forearm. The radius goes from the outside edge of the elbow to the thumb side of the wrist.

Contracting the biceps muscle can bend the elbow upward. The biceps can also help flex the shoulder, raising the arm up. And the biceps can rotate, or twist, the forearm in a way that points the palm of the hand up. This movement is called supination. Supination positions the hand as if you were carrying a tray.

Causes

Why did I develop a rupture of the distal biceps?

The most common cause of a distal biceps rupture happens when a middle-aged man lifts a box or other heavy item with his elbows bent. Often the load is heavier than expected, or the load may shift unexpectedly during the lift. This forces the elbow to straighten, even though the biceps muscle is working hard to keep the elbow bent. The biceps muscle contracts extra hard to help handle the load. As tension on the muscle and tendon increases, the distal biceps tendon snaps or tears where it connects to the radius.

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Symptoms

What does a ruptured distal biceps feel like??

When the distal biceps tendon ruptures, it usually sounds and feels like a pop directly in front of the elbow. At first the pain is intense. The pain often subsides quickly after a complete rupture because tension is immediately taken off the pain sensors in the tendon. Swelling and bruising in front of the elbow usually develop shortly after the pop. The biceps may appear to have balled up near the elbow. The arm often feels weak with attempts to bend the elbow, lift the shoulder, or twist the forearm into supination (palm up).

The distal biceps tendon sometimes tears only part of the way. When this happens, a pop may not be felt or heard. Instead, the area in front of the elbow may simply be painful, and the arm may feel weak with the same arm movements that are affected in a complete rupture.

Diagnosis

How is Dr Nelson sure I have ruptured the distal biceps?

An early diagnosis is best. If surgery is needed, people who've ruptured their distal biceps tendon usually have better results when surgery is done soon after the injury.

Dr Nelson will first take a detailed medical history. You will need to answer questions about your pain, how your pain affects you, your regular activities, and past injuries to your elbow.

The physical exam is often most helpful in diagnosing a rupture of the distal biceps tendon. Dr. Nelson may position your elbow and forearm to see which movements are painful and weak. By feeling the muscle and tendon, your doctor can often tell if the tendon has ruptured off the bone.

X-rays may be ordered. X-rays are mainly used to find out if there are other injuries in the elbow. Plain X-rays do not show soft tissues like tendons. They will not show a distal biceps rupture unless a small piece of bone got pulled off the radius as the tendon ruptured. This type of injury is called an avulsion fracture. Dr. Nelson rarely may also order a magnetic resonance imaging (MRI) scan to see if the biceps tendon is only partially torn or if the tendon fully ruptured. An MRI is a special imaging test that uses magnetic waves to create pictures of the elbow in slices. The MRI can also show if there are other problems in the elbow.

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Nonsurgical Treatment

Many doctors prefer to treat distal biceps tendon ruptures with surgery. Nonsurgical treatments are usually only used for people who do minimal activities and require minimal arm strength. Nonsurgical treatments are only used if arm weakness, fatigue, and mild deformity aren't an issue. If you are an older individual who can tolerate loss of strength, or if the injury occurs in your nondominanat arm, you and Dr. Nelson may decide that surgery is not necessary.

Not having surgery often results in significant loss of strength. Flexion of the elbow is somewhat affected, but supination (which is the motion of twisting the forearm, such as when you use a screwdriver) can be very affected. A distal biceps rupture that is not repaired reduces supination strength by about 50 percent.

Nonsurgical measures may include a sling to rest the elbow. Patients may be given anti-inflammatory medicine to help ease pain and swelling and get them back to activities sooner. These medications include common over-the-counter drugs such as ibuprofen. Dr. Nelson may have you work with a physical or occupational therapist. At first, your therapist will give you tips how to rest your elbow and how to do your activities without putting extra strain on the joint. Your therapist may apply ice and electrical stimulation to ease pain. Exercises are used to gradually strengthen other muscles that can help do the work of a normal biceps muscle.

Surgery

People who need normal arm strength get best results with surgery to reconnect the tendon right away. Surgery is needed to avoid tendon retraction. When the tendon has been completely ruptured, contraction of the biceps muscle pulls the tendon further up the arm. When the tendon recoils from its original attachment and remains there for a very long time, the surgery becomes harder, and the results of surgery are not as good.

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Distal Bicep Tendon Repair- Rehabilitation Protocol

The intent of this protocol is to provide the clinician with a guideline of the post- operative rehabilitation course for a patient that has undergone a distal biceps tendon repair. It is by no means intended to be a substitute for one's clinical decision making regarding the progression of a patient's post-operative course based on their physical exam/findings, individual progress, and/or the presence of post-operative complications. If a clinician requires assistance in the progression of a post-operative patient they should consult with the referring Surgeon.

Initial Post operative Immobilization

• Posterior splint, elbow immobilization at 90° for 5-7 days with forearm in neutral (Unless otherwise indicated by surgeon)

Hinged Elbow Brace

• Elbow placed in a hinged ROM brace at 5-7 days postoperative. Brace set unlocked at 45° to full flexion.

• Gradually increase elbow ROM in brace (see below) Hinged Brace Range of Motion Progression

(ROM progression may be adjusted base on Surgeon's assessment of the surgical repair.)

Week 2	45° to full elbow flexion
Week 3	45° to full elbow flexion
Week 4	30° to full elbow flexion
Week 5	20° to full elbow flexion
Week 6	10° to full elbow flexion
Week 8	Full ROM of elbow discontinue brace if adequate motor control

Range of Motion Exercises (to above brace specifications)

Weeks 2-3

- Passive ROM for elbow flexion and supination (with elbow at 90°)
- Assisted ROM for elbow extension and pronation (with elbow at 90°)
- Shoulder ROM as needed based on evaluation, avoiding excessive extension.

Weeks 3-4

- Initiate active-assisted ROM elbow flexion
- Continue assisted extension and progress to passive extension ROM

Week 4

- Active ROM elbow flexion and extension

Weeks 6-8

- Continue program as above
- May begin combined/composite motions (i.e. extension with pronation).
- If at 8 weeks post-op the patient has significant ROM deficits therapist may
- consider more aggressive management, after consultation with referring surgeon, to regain ROM.

Strengthening Program

Week 1

— Sub-maximal pain free isometrics for triceps and shoulder musculature.

Week 2

—Sub-maximal pain free biceps isometrics with forearm in neutral.

Week 3-4

—Single plane active ROM elbow flexion, extension, supination, and pronation.

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Week 8
—Progressive resisted exercise program is initiated for elbow flexion, extension, supination, and pronation.

Progress shoulder strengthening program
Weeks 12-14
—May initiate light upper extremity weight training.
—Non-athletes initiate endurance program that simulates desired work activities/requirements.