

essential skills

BY BEN E. BENJAMIN



BICEPS INJURIES

In some ways, the biceps is one of the best-known muscles in the human body. Even for people who know next to nothing about muscular anatomy, this structure is easy to locate and engage. Bulging biceps are universally recognized as a symbol of strength. (Just think of a typical bodybuilding stance.) But it can sometimes be challenging to identify biceps injuries and differentiate them from other injuries in the shoulder, elbow, and forearm area.

The biceps muscle helps to flex the elbow and supinate the forearm. You use this structure whenever you lift your massage table or use a screwdriver. (The image of the biceps as being particularly strong is misleading, since the real power in elbow flexion comes from the brachialis muscle, located beneath the biceps.) While most muscles cross over

only one joint, the biceps crosses over two: the elbow and the shoulder. As its name suggests, this muscle has two parts, or heads; the lower attachment begins at a common tendon just inferior to the elbow at the top of the forearm on the radial tuberosity. The short head has its own tendon, which attaches just above the axilla onto the coracoid process. The tendon of the long head dives through the center of the shoulder joint and attaches toward the back of the joint, deep beneath the surface.

The biceps muscle-tendon unit can be injured in five distinct places. Pain felt at the shoulder or in the upper arm suggests an injury to the muscle belly, the musculotendinous junction, or (most commonly) the body of the upper tendon above the muscle belly. When the pain is felt near the elbow, it is likely that either the distal attachment or the lower tendon near the crease in the elbow has been injured.

The location of the pain can be misleading; depending on where the pain is felt, biceps injuries may be mistaken for injuries to the shoulder joint, deltoid muscle, triceps muscle, or elbow. Conversely, injuries to other structures may refer pain to the upper arm and be mistaken for biceps injuries. This commonly happens with injuries to rotator cuff tendons, especially the subscapularis tendon.

HOW AND WHY THESE INJURIES OCCUR

Biceps injuries often result from some form of lifting—whether it's weight training as part of an exercise program or moving heavy objects in the course of one's job. They're common in people who have decided to be their own movers, not realizing how heavy

their furniture is. These injuries typically occur when a person pushes too far when fatigued or starts to drop something heavy (such as one end of a piano) and then reaches out to catch it.

In the days and weeks following a biceps strain, the person may start to notice pain with certain daily activities. For right-handed individuals, closing jars tightly or tightening a screw might cause pain; those who are left-handed would instead feel pain when opening jars and loosening screws. Sometimes the short head of the biceps ruptures completely and the muscle rolls up on itself, causing a lump to appear. This can happen to anyone, but generally affects people over 60. While the rolled-up muscle doesn't look attractive, it causes no actual harm. Very little strength is lost and no treatment is necessary.

INJURY VERIFICATION

Before beginning treatment, it's crucial to use assessment tests and palpation to determine where the injury is located. Injuries near the elbow, either in the lower tendon or at the lower attachment to the forearm, are relatively easy to identify. Since they cause no referred pain, the location of the pain tells you the location of the injury. Injuries at the upper attachment, in the muscle belly, or in the tendon body near the base of the deltoid muscle can be harder to pinpoint; a severe strain at any of these locations can refer pain all the way down to the wrist or to the posterior portion of the upper arm.



Test 1. Resisted Flexion of the Elbow
With the client standing, have the person hold the elbow of the injured arm at a right angle, with the palm toward the ceiling. Now place one or both of your hands just above the wrist and ask the client to flex the elbow as you apply an equal and opposite downward pressure. This test stresses both the biceps and the brachialis muscles, so you need to do the next test to figure out which one is injured.



Test 2. Resisted Supination of the Forearm
Again, have the client standing with the elbow at a right angle. With both of your hands just above the wrist, grip the wrist to hold it in place. Now ask the client to try to supinate (outwardly rotate) the forearm, so that the palm faces the ceiling. Apply an equal and opposite force, not allowing the wrist to rotate. Pain felt on both Test 1 and Test 2 indicates that the biceps is injured.



Test 3. Passive Pronation of the Forearm
Perform this test if Test 1 causes pain at the crease of the elbow or below the elbow at the tendon attachment to the forearm. With the elbow slightly bent, forcefully pronate the forearm to the end of the range of motion. This movement does not use any resistance; the client's arm should remain limp. If the lower attachment of the biceps is injured, the very end of this movement will pinch the tendon and be quite painful.

Once you've established that the biceps is injured, palpate the structure to see which fibers have been affected. If the pain is felt in the upper arm, palpate the upper tendon body and the muscle belly. If the pain is felt in the elbow region, palpate the lower tendon and the lower attachment to the radius. If you're unsure about your findings from the palpation, compare the injured side with the uninjured side.

TREATMENT CHOICES

SELF-TREATMENT

For a relatively recent, mild injury to the muscle belly, a few weeks of rest along with some biceps exercises will often help resolve the problem. Tendon strains are usually more long lasting and generally need some treatment. (See Exercises for specific exercise recommendations.)

FRICTION THERAPY AND MASSAGE

Hands-on treatments are effective when the strain has occurred in the muscle belly or in an easily accessible portion of the upper or lower tendon. They do not work if the injury is in the part of the tendon that penetrates the shoulder joint. When performing any of the following friction techniques, work 10–15 minutes at a time, taking breaks as necessary. Follow the friction with massage to the upper arm, lower arm, and shoulder. Repeat two or three times a week for four to six weeks.

Location and Friction of the Upper Biceps Tendon

Sit at the side of the table facing the client. Have the client flex the biceps slightly against resistance, as in Test 1, to make the biceps tendon taut and easier to locate. Then use your thumb pad to palpate the tendon, while applying a counter-pressure with your fingers at the back of the arm. Once you've located the structure, have the person relax and apply cross-fiber friction in a medial-to-lateral direction. Alternatively, you can leave your thumb in place and rotate the client's humerus medially and laterally underneath it. The tendon will snap back and forth as you move the lower arm. This technique is less tiring.

Location and Friction of the Biceps Muscle Belly

Sit facing the client and grasp the posterior surface of the biceps muscle (near the bone) between your fingers and thumb, in a claw-like position.

Maintain this grip as you pull your hand anteriorly toward yourself, then release the pressure slightly, move your hand back toward the bone, and repeat.

Location and Friction of the Lower Biceps Tendon

Sit either beside or facing the client. To locate the tendon, place the client's arm at a right angle and have the person flex the elbow against resistance. You will see and feel the tendon as it crosses the elbow joint. Follow the tendon with your finger then have the client relax the arm and apply several friction strokes to locate the most painful areas. At each of these areas, use the tip of your thumb to apply friction across the tendon fibers. Alternatively, you can use your thumb to apply pressure on the medial aspect of the tendon and then rotate the forearm; the tendon will snap back and forth as you do this.

Location and Friction of the Lower Biceps Attachment

Sit beside or facing the client, and use the method described above to locate the lower biceps tendon. Follow the tendon to its attachment at the radial tuberosity, about one-half to three-quarters of an inch distal to the elbow crease. Then place the tip of your thumb at the tenoperiosteal junction, bracing with your other fingers at the back of the forearm, and apply friction across the tendon fibers. Alternatively, you can apply pressure on the tendon with your thumb and rotate the forearm between full supination and half pronation.

EXERCISES

For the rehabilitation of any muscle-tendon injury, it's most effective to combine strength building with stretching. Have clients start out using a light weight, just 1 or 2 pounds, and work their way up. The weighted exercises should cause fatigue after 20 or so repetitions out of a total

of 30; if the person tires before 20 repetitions, decrease the amount of weight. It's important to stretch both before and after performing the exercises. One good biceps stretch to give to your clients is described below. For a more thorough series of stretches, I recommend those devised by Aaron Mattes as part of his Active Isolated Stretching (see Mattes, A. *Active Isolated Stretching: The Mattes Method*. Sarasota, FL: Aaron Mattes Therapy, 2000, pages 20 and 89.

Biceps Curls

From a standing position, hold a weight in the hand on your injured side. With your arm hanging straight down, palm facing forward, bend the elbow to bring the hand toward the shoulder. Then uncurl the arm slowly; performing this eccentric contraction (in which the muscle fibers slowly lengthen as they contract) builds strength more effectively than concentric contraction alone (in which the muscle fibers shorten as they contract). Do three sets of 10 repetitions.

Supination

Hold the weight with your elbow bent at a 90° angle and your palm facing the floor, and then rotate the palm toward the ceiling. Repeat for three sets of 10.

Stretch

With your arm reaching out straight behind you, elbow extended, place the palm of your hand on a countertop. Now bend your knees to stretch the biceps (for some people, this is easier to perform in a lunge position). Hold the stretch for two seconds and repeat 15–20 times.

INJECTIONS

While most biceps injuries respond well to rest or to friction, exercise, and massage therapy, there is one notable exception. The part of the biceps tendon that passes through the shoulder joint is too deep to

reach with the fingers. When that area is injured, corticosteroid and/or proliferant injections may be the only effective treatment.

CONCLUSION

While biceps strains aren't among the most common injuries we see, failure to understand them can lead practitioners into trouble. Without proper treatment, a biceps injury may heal improperly, leading to a buildup of adhesive scar tissue that causes a chronic pattern of recurring pain. Assessment tests and palpation are critical in identifying which portions of the biceps muscle-tendon unit are injured, or—in some cases—demonstrating that injury to another structure (such as the subscapularis or brachialis) is mimicking a biceps strain. So although building your biceps knowledge won't make you stronger or improve your physique, it will help make you a more effective massage therapist. **m&b**

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