

A Rare But Important Tendon Injury

Physical Therapy in Fremont, Carbon, and Sweetwater Counties for Elbow

Have you fallen on your outstretched arm, and now have difficulty straightening your elbow? This article is concerned with triceps muscle rupture, and outlines the importance of early diagnosis, and treatment. Persons who have sustained an arm injury are advised to seek an assessment at Fremont Therapy Group to diagnose their specific injury.

When Popeye, the cartoon sailor man wanted to show off his muscles, he lifted his arm and flexed his biceps muscle. Every child who ever wanted to show off his or her strength has imitated this posture ever since. But when Arnold Schwarzenegger, a well-known actor in Terminator movies posed, it was always with the hands pressed together in front of his body. This body builder pose shows off the chest and triceps muscles. The triceps is located along the back of the upper arm. It's the triceps muscle that catches our attention in this article.

The triceps muscle doesn't tear or rupture very often. In fact, of all the tendons in the body that do get injured, injuries affecting this one are reported the least often. When it does happen, it's usually in a professional-level football player or weight lifter. Of course, the nature of these sports with potentially violent contact or powerful lifts increases the risk of this type of injury. But the illegal use of steroids to build up the muscles can lead to rupture of the triceps tendon, too. Anyone who falls on an outstretched hand is at risk for a triceps injury. Getting cut with a knife or other sharp object such as a piece of glass can also disrupt the muscle and/or its tendon at its attachment.

The triceps tendon is a broad three-sectioned muscle that comes down along the back of the upper arm from the shoulder and inserts into the back of the elbow. The place where these three sections meet into one tendon and attaches to the bone is called the triceps footprint. When the muscle is completely torn, the tendon usually pulls away from its footprint. Sometimes the traumatic event is so powerful that the tendon pulls away still attached to the footprint, taking a piece of the underlying bone with it. Because the muscle functions to straighten the elbow, when it is ruptured, arm extension is compromised.

What does a torn triceps look and feel like? First, there's pain reported along the back of the elbow and visible swelling there. It is very tender to touch in this same area. Often, there's a large indentation in the skin called a defect just above the olecranon (point of the elbow). The defect can be seen and felt.

There may be weakness with elbow extension against resistance. The patient may not be able to extend (straighten) the elbow at all or only through part of the normal range-of-motion. But surprisingly, a completely ruptured triceps doesn't mean the patient won't always be unable to extend the elbow against resistance. There is another muscle that helps the triceps (the anconeus) and it may compensate for the loss of the main muscle.

The examining physician can do a clinical test to look for a triceps rupture. It's modified from a test for ruptures of the Achilles tendon at the back of the foot/heel. A squeezing pressure is applied by the examiner to the triceps muscle. The test is done with the patient lying face down on an examining table. The elbow is bent and the forearm is dangling over the edge of the table. When the triceps is intact or only partially torn,

squeezing the muscle belly causes the elbow to extend (just as if the muscle contracted on its own). No movement of the elbow with this test is a sign that the tendon is fully ruptured.

Further testing is needed to confirm the diagnosis. X-rays will show if the bone has been avulsed or pulled away with the tendon. X-rays also show if there are any fractures of the bones of the elbow. MRIs and ultrasound studies help identify the full extent of the lesion (location and severity). All this information is needed when planning the most appropriate treatment. The surgeon also takes into consideration the patient's age, physical condition, and how long the injury has been present (acute versus chronic). Both the current level of function and the desired level of function are factored into the decision. It makes a difference whether the patient is a young athlete, eager to get back on the playing field versus an older adult struggling to push up out of a chair or off the toilet.

Current treatment guidelines for triceps tears include: conservative care for anyone with less than half the tendon torn and for older adults with more than half the tendon thickness torn who are inactive. Surgery is always advised when the triceps has ruptured completely away from the tendon footprint. When surgery is indicated, it should be done as soon as possible (within the first two weeks of injury). A delay in diagnosis and/or in treatment can result in significant loss of muscle strength and other complications.

When surgery is not the first-line of treatment, the patient is instructed to keep the arm in a splint (or cast) for 30-days. The arm will be immobilized in a position of 30 degrees of elbow flexion. This position helps protect the triceps tendon from tearing more by avoiding muscle contraction needed to get the last bit of elbow extension. If the conservative (nonoperative) approach doesn't work, then surgery is the next option considered.

The authors discuss the various surgical techniques used to reattach the torn tendon depending on how close the muscle is torn to its footprint. Slightly different methods might be used when there is complete rupture with avulsion (tendon still attached to bone). Step-by-step color photos of the surgeons' preferred technique are provided with a detailed description. Angle of drill holes, type of sutures used, and placement of suture anchors are also described.

Basically, they try to restore the tendon attachment as close to the preinjury anatomy as possible. This procedure is called an anatomic triceps tendon footprint repair. It is thought to be the best way to get tendon-to-bone healing and the best results possible in terms of function. Care is taken with the incision in order to see clearly what's going on while avoiding delays in wound healing and other potential problems with wound healing.

Postoperative care and management are just as important as the actual surgical procedure. The arm doesn't have to be put in a splint or cast. A simple sling works just fine. The patient is allowed to take it off or stop wearing it whenever he or she feels comfortable doing so. In the early days after surgery, a physical or occupational therapist will work with the patient to maintain elbow and forearm movement. Strengthening exercises will begin when full (or near normal) elbow motion is present. Lifting weights isn't allowed for the first four to six months after surgery.

You can see a complete rupture requiring surgery can really put an athlete behind in terms of training and competition. And it's no picnic for the older adult either. Struggling just to do daily tasks and activities can become a real burden. In all patients, there's a risk of re-rupture. This is especially true for those patients who waited to have surgery done or who weren't diagnosed quickly.

The quality of the tissue that needs repairing changes as time goes by. It can become filled with and surrounded by fibrotic (scar) tissue that is weak and tears easily. Sometimes the tendon retracts (pulls back)

so far, it can't be pulled back down to reach the footprint for repair. Then the procedure becomes a reconstruction rather than a simple repair.

Now we're talking graft material to lengthen the tendon and that raises all sorts of other complications -- where should the graft be taken from? Can the patient donate tendon tissue from his or her own body or is tendon from a donor bank needed? Each of these sources of tendon graft material has plusses and minuses.

When it's all said and done, patients with a complete and full rupture of the triceps tendon can recover nicely. Studies that have been done showed a return of motion and strength even in patients who had a delayed surgery. There can be a loss of full elbow extension that never fully returns but this doesn't always mean the individual can't get back to a preinjury level of function.

Reference: Peter C. Yeh, MD, et al. Distal Triceps Rupture. In *Journal of the American Academy of Orthopaedic Surgeons*. January 2010. Vol. 18. No. 1. Pp. 31-40.