

The Forgotten Rotator-Cuff Muscle

EVALUATING AND TREATING TERES MINOR INJURIES.

Ben Benjamin, PhD

The **teres minor** is the weakest of the four rotator-cuff muscles. It is the brother of the **infraspinatus** because they are generally responsible for the same thing: lateral rotation. The **teres minor** gets a lot of use when you turn the steering wheel of your car or reach high up on a shelf to get something. The **teres minor** works more at slightly different angles from the **infraspinatus** and assists in adducting the arm.

Try this: Put your hand on top of your head with your thumb facing down toward the floor, put your other hand on the ulna side of your wrist for resistance and then push up with the bottom hand. You are now engaging a number of muscles, but more of the **teres minor** than with any other motion.

The **teres minor** originates at the dorsal surface of the axillary border of the scapula. Its fibers run obliquely upward and laterally; the upper fibers end at the **teres minor** tendon, which is inserted into the inferior facet of the greater tubercle of the humerus. The tendon of the **teres minor** passes across the glenohumeral joint and joins with the posterior part of the joint capsule.

The **infraspinatus** and **teres minor** attach to the head of the humerus and form the posterior part of the **rotator cuff**. They help hold the humeral head into the glenoid cavity of the scapula. They work along with the posterior deltoid muscle to laterally rotate the humerus, as well as perform adduction and assist in extension of the arm behind you. Sometimes the **teres minor** is actually fused with the **infraspinatus**.

Evaluating for Teres Minor Involvement: Two Key Tests

1. The patient's arm is overhead, the elbow bent at about 15 degrees, hand facing anteriorly above the forehead. Gently grasp the patient's wrist on the ulna side. They push up as you apply an equal and opposite force down. Remember, with resisted tests no movement through space should occur. It often takes very little pressure to induce the pain when a **teres minor** injury is present, so start out with very little pressure.
2. In this next test, we combine lateral rotation with adduction (with the hand at the elbow). Since the **teres minor** is both lateral rotator and an adductor of the shoulder, this test performs both at the same time. The patient bends the elbow at 90 degrees and brings it a few inches away from the body. Place one hand on the patient's distal dorsal forearm just proximal to the wrist, and place the other hand on the medial elbow. Ask the patient to push laterally at their wrist as they try to bring their elbow toward their ribs into adduction.

When the **teres minor** is injured, one or both of these tests are painful. The overhead push test is most likely to be painful.

Differentiating a **teres minor** from an **infraspinatus** injury is a tricky piece of assessment. The first thing to notice is weakness as well as pain. When the body is injured, it's very difficult, if not impossible, to maintain strength, especially for a little muscle like the **teres minor**.

People who suffer this injury are usually very athletically active. In most cases, the infraspinatus is the one that gets injured when lateral rotation is involved. In order to engage the teres minor, you need to do something either very strenuous or something that pulls you to the medial aspect of your hand.

One way to get this injury is by doing a handstand, because you have to balance yourself using all parts of the shoulder in subtle ways. In order to balance yourself side to side, you have to use the teres minor, and if you lose your balance slightly, you'll grip with this part of the rotator-cuff complex.

Treating Teres Minor Injuries

When treating the teres minor, the injury usually occurs either in the tenoperiosteal junction or in the tendon body itself. Let's take a moment to review the tenoperiosteal junction. This is where the tendon attaches to the bone.

The teres minor attachment is just lateral to the infraspinatus tendon. And if you have ever done cadaver work you know that it's enmeshed in a common fascia. Sometimes the teres minor is even conjoined with the infraspinatus tendon.

What this means is you're going to work on the most lateral part of the tendon attachment to the greater tubercle of the humerus; or slightly distal to the lateral aspect of the tendon body itself. When this tendon attachment or tendon is injured, it's extremely tender to the touch.

I remember one client who said to me, "Wouldn't that hurt anybody?" To which I replied, "No, as a matter of fact, it wouldn't." Then I asked him to turn over on his other side and did the same palpation to his healthy teres minor tendon. He was amazed that it didn't hurt at all. This is often a good way to educate your patients that both the pain on the assessment tests and on the palpation together form the evidence as to what is injured.

For the treatment, first ask the patient to lie on their side, injured side up, with a pillow under their head to protect their neck. Then have them extend the arm upward at about 70 degrees. This puts the teres minor on the stretch, and makes it easier to access and treat the tendon or its attachment.

Using your thumb, find the greater tubercle at the posterior aspect of the shoulder; now move to the most lateral portion of the tubercle and palpate the tendon, both as it attaches to the bone and further distally at the tendon body. When you palpate it, if it's injured it will be quite uncomfortable to the touch.

The treatment involves a friction therapy at a 90 degree angle to the injured tendon, done in one direction only for a period of 5 minutes. Take a break and then repeat for another 5 minutes. Remember to keep the discomfort to a minimum just so it is slightly annoying, but never really painful.

You have to be able to do this treatment for a period of time in order for it to succeed, so be sure to monitor the patient's discomfort as you work. The patient may be sore for up to 48 hours. Don't forget to tell them that so they understand if they are sore for a few days. They may not be sore at all - and that's OK, too.

Exercises to Assist in the Rehabilitation / Healing Process

Since the teres minor and infraspinatus muscles perform some of the same actions, the first

strengthening exercise is the same for both. As soon as the patient can perform the motion described in exercise #1 below using 1 pound of weight without pain or discomfort, they can begin doing the exercise daily. This usually occurs after several treatments. Show the patient the exercise and then check to see they are doing it correctly on their next visit.

Exercise #1: Patient lies on their side with the injured side up, and allows the injured arm to hang down in front of them. They grasp a 1-3-pound weight, keeping the elbow and upper arm close to their body, and lifts their hand, rotating the arm toward the ceiling until it is at a 180 degree angle to the body.

Patient should perform three sets of 10 of this exercise, resting momentarily between each set. If there is pain during exercise, patient should stop. There should be a sense of fatigue near the end of the third set.

After the patient has been conscientiously doing exercise #1 for a week or two, add exercise #2 as follows:

Exercise # 2: This second teres minor exercise, which combines lateral rotation with adduction, requires a soft 5-6-inch ball or a rolled-up bath towel in addition to a light free weight.

Patient should lie down on their "good" side with a pillow under the head, and place the ball or rolled-up towel in the axilla. They grasp a weight and bend the elbow of the injured shoulder at 90 degrees. The weight should be just in front of the navel. Next, patient should slowly laterally rotate the shoulder, bringing the hand into the air, while simultaneously squeezing the ball or towel toward the ribs.

The patient continues performing the exercises until they can perform three sets of 10 with 6-10 pounds without any fatigue. The maximum weight will depend on the size and strength of the person. In order to establish a benchmark, see how much weight the person can handle with their good shoulder.

JUNE 2014