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A Patient's Guide to

Lateral Epicondylitis (Tennis Elbow)



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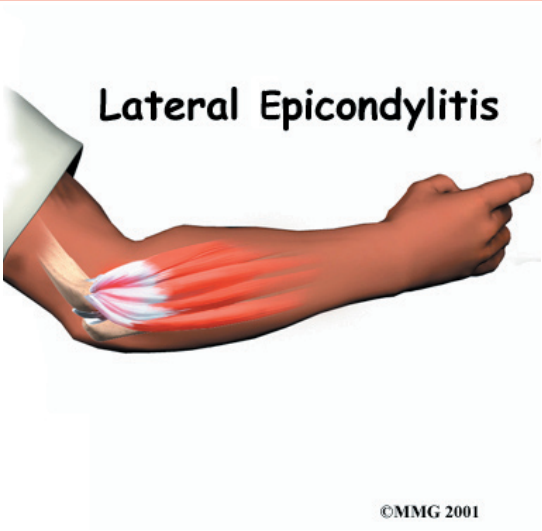


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Introduction

Lateral epicondylitis, commonly known as *tennis elbow*, is not limited to tennis players. The backhand swing in tennis can strain the muscles and tendons of the elbow in a way that leads to tennis elbow. But many other types of repetitive activities can also lead to tennis elbow: painting with a brush or roller, running a chain saw, and using many types of hand tools. Any activities that repeatedly stress the same forearm muscles can cause symptoms of tennis elbow.

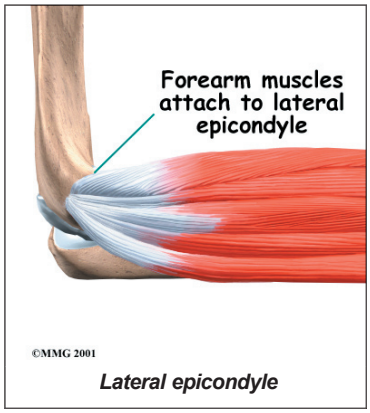
This guide will help you understand

- **what parts of the elbow are affected**
- **the causes of tennis elbow**
- **ways to make the pain go away**

Anatomy

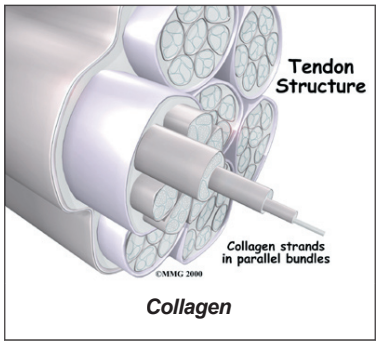
What parts of the elbow are affected?

Tennis elbow causes pain that starts on the outside bump of the elbow, the *lateral epicondyle*. The forearm muscles that bend the wrist back (the *extensors*) attach on the **lateral epicondyle** and are connected by a single *tendon*. Tendons connect muscles to bone.



Lateral epicondyle

Tendons are made up of strands of a material called ***collagen***. The collagen strands are lined up in bundles next to each other.



Collagen

Because the collagen strands in tendons are lined up, tendons have high *tensile strength*. This means they can withstand high forces that pull on both ends of the tendon. When muscles work, they pull on one end of the tendon. The other end of the tendon pulls on the bone, causing the bone to move.

When you bend your wrist back or grip with your hand, the wrist extensor muscles contract. The contracting muscles pull on the extensor tendon. The forces that pull on these tendons can build when you grip things, hit a tennis ball in a backhand swing in tennis, or do other similar actions.

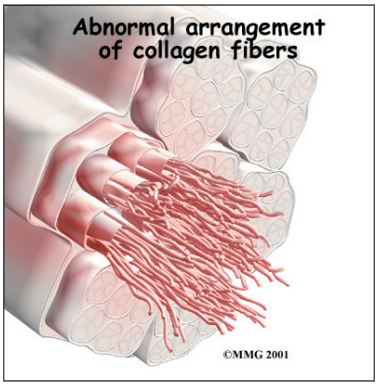
Causes

Why did I develop tennis elbow?

Overuse of the muscles and tendons of the forearm and elbow are the most common reason people develop tennis elbow. Repeating some types of activities over and over again can put too much strain on the elbow tendons. These activities are not necessarily high-level sports competition. Hammering nails, picking up heavy buckets, or pruning shrubs can all cause the pain of tennis elbow.

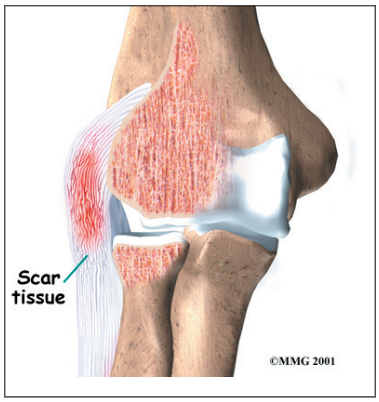
In an acute injury, the body undergoes an inflammatory response. Special inflammatory cells make their way to the injured tissues to help them heal. Conditions that involve inflam-

mation are indicated by *-itis* on the end of the word. For example, inflammation in a tendon is called *tendonitis*. Inflammation around the lateral epicondyle is called *lateral epicondylitis*.



However, tennis elbow often does not involve inflammation. Rather, the problem is within the cells of the tendon. Doctors call this condition *tendinosis*. In tendinosis, wear and tear is thought to lead to tissue degeneration. A degenerated tendon usually has an **abnormal arrangement of collagen fibers**.

Instead of inflammatory cells, the body produces a type of cells called *fibroblasts*. When this happens, the collagen loses its strength. It becomes fragile and can break or be easily injured. Each time the collagen breaks down, the body responds by forming scar tissue in the tendon. Eventually, the tendon becomes thickened from extra scar tissue.



No one really knows exactly what causes tendinosis. Some doctors think that the forearm tendon develops small tears with too much activity. The tears try to heal, but constant strain and overuse keep re-injuring the tendon. After a while, the tendons stop trying to heal. The **scar tissue** never has a chance to fully heal, leaving the injured areas weakened and painful.

Symptoms

What does tennis elbow feel like?

The main symptom of tennis elbow is tenderness and pain that starts at the lateral epicondyle of the elbow. The pain may spread down the forearm. It may go as far as the back of the middle and ring fingers. The forearm muscles may also feel tight and sore.

The pain usually gets worse when you bend your wrist backward, turn your palm upward, or hold something with a stiff wrist or straightened elbow. Grasping items also makes the pain worse. Just reaching into the refrigerator to get a carton of milk can cause pain. Sometimes the elbow feels stiff and won't straighten out completely.

Diagnosis

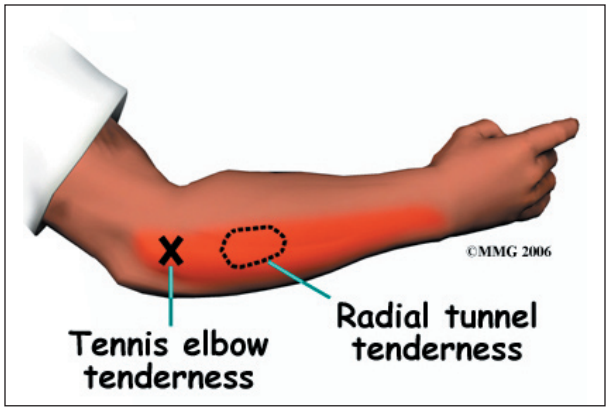
How can my doctor be sure I have tennis elbow?

Your doctor 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 tennis elbow. Your doctor may position your wrist and arm so you feel a stretch on the forearm muscles and tendons. This is usually painful with tennis elbow. There are also other tests for wrist and forearm strength that can be used to detect tennis elbow.

You may need to get X-rays of your elbow. The X-rays mostly help your doctor rule out other problems with the elbow joint. The X-ray may show if there are calcium deposits on the lateral epicondyle at the connection of the extensor tendon.

Tennis elbow symptoms are very similar to a condition called *radial tunnel syndrome*. This condition is caused by pressure on the *radial*



nerve as it crosses the elbow. If your pain does not respond to treatments for tennis elbow, your doctor may suggest tests to rule out problems with the radial nerve.

When the diagnosis is not clear, your doctor may order other special tests. A *magnetic resonance imaging* (MRI) scan is a special imaging test that uses magnetic waves to create pictures of the elbow in slices. The MRI scan shows tendons as well as bones.

Ultrasound tests use high-frequency sound waves to generate an image of the tissues below the skin. As the small ultrasound device is rubbed over the sore area, an image appears on a screen. This type of test can sometimes show problems with collagen degeneration.

Treatment

What can I do to make my pain go away?

Nonsurgical Treatment

The key to nonsurgical treatment is to keep the collagen from breaking down further. The goal is to help the tendon heal.

If the problem is caused by acute inflammation, anti-inflammatory medications such as ibuprofen may give you some relief. If inflammation doesn't go away, your doctor may inject the elbow with *cortisone*. Cortisone is a powerful anti-inflammatory medication. Its benefits are temporary, but they can last for a period of weeks to several months.

Your doctor may suggest using ultrasound to guide a needle into the sore area. The ultrasound gives a clear picture of areas in the tendon that contain scar tissue. Poking holes in the tendon breaks up scar tissue and gets the tendon to bleed. Bleeding in the tendon helps stimulate the healing response.

Shock wave therapy is a newer form of nonsurgical treatment. It uses a machine to generate shock wave pulses to the sore area. Patients generally receive the treatment once each week for up to three weeks. It is not known exactly why it works for tennis elbow, but recent studies indicate that this form of treatment can help ease pain, while improving range of motion and function.

Doctors commonly have patients with tennis elbow work with a physical or occupational therapist. At first, your therapist will give you tips on how to rest your elbow and how to do your activities without putting extra strain on your elbow. Your therapist may apply tape to take some of the load off the elbow muscles and tendons. You may need to wear an elbow strap that wraps around the upper forearm in a way that relieves the pressure on the tendon attachment.

Your therapist may apply ice and electrical stimulation to ease pain and improve healing of the tendon. Therapy sessions may also include *iontophoresis*, which uses a mild electrical current to push anti-inflammatory medicine to the sore area. This treatment is especially helpful for patients who can't tolerate injections. Exercises are used to gradually stretch and strengthen the forearm muscles.

Because tendinosis is often linked to overuse, your therapist will work with you to reduce repeated strains on your elbow. When symptoms come from a particular sport or work activity, your therapist will observe your style and motion with the activity. You may be given tips about how to perform the movement

so the elbow is protected. Your therapist can check your sports equipment and work tools and suggest how to alter them to keep your elbow safe.

Surgery

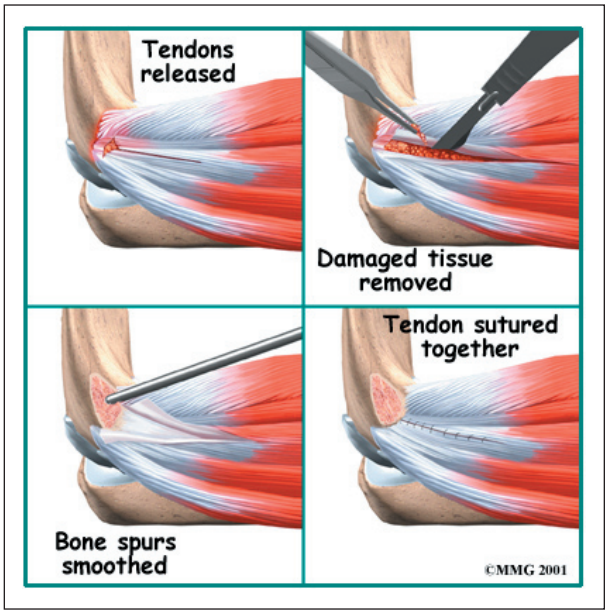
Sometimes nonsurgical treatment fails to stop the pain or help patients regain use of the elbow. In these cases, surgery may be necessary.

Tendon Debridement

When problems are caused by tendinosis, surgeons may choose to take out (*debride*) only the affected tissues within the tendon. In these cases, the surgeon cleans up the tendon, removing only the damaged tissue.

Tendon Release

A commonly used surgery for tennis elbow is called a *lateral epicondyle release*. This surgery takes tension off the extensor tendon. The surgeon begins by making an incision along the arm over the lateral epicondyle. Soft tissues are gently moved aside so the surgeon can see the point where the extensor tendon attaches on the lateral epicondyle.



The extensor tendon is then cut where it connects to the lateral epicondyle. The surgeon splits the tendon and takes out any extra scar tissue. Any *bone spurs* found on the lateral epicondyle are removed. (Bone spurs are pointed bumps that can grow on the surface of the bones.) Some surgeons suture the loose end of the tendon to the nearby *fascia* tissue. (Fascia tissue covers the muscles and organs throughout your body.) The skin is then stitched together.

This surgery can usually be done on an outpatient basis, which means that you don't have to stay overnight in the hospital. It can be done using a *general anesthetic* or a *regional anesthetic*. A general anesthetic puts you to sleep. A regional anesthetic blocks only certain nerves for several hours. For surgery on the elbow, you would most likely get an *axillary block* to numb your arm.

Rehabilitation

How soon can I use my elbow again?

Nonsurgical Rehabilitation

In cases where the tendon is inflamed, nonsurgical treatment is usually only needed for four to six weeks. When symptoms are from tendinosis, you can expect healing to take longer, usually up to three months. If your tendinosis is severe, it may take at least six months for complete healing.

After Surgery

What do I need to know after surgery?

Rehabilitation takes much longer after surgery. Immediately after surgery, your elbow is placed in a removable splint that keeps your elbow bent at a 90-degree angle. Your first few therapy sessions may involve ice and electrical stimulation treatments to help control pain and swelling from the surgery. Your therapist may also use massage and other types of hands-on treatments to ease muscle spasm and pain.

You will gradually work into more active stretching and strengthening exercises. You just need to be careful to avoid doing too

much, too quickly. Active therapy starts about two weeks after surgery. Your therapist may begin with light isometric strengthening exercises. These exercises work the muscles of the forearm without straining the healing tissues. You will use your own muscle power in active range-of-motion exercises.

At about six weeks, you start doing more active strengthening. As you progress, your therapist will teach you exercises to strengthen and stabilize the muscles and joints of the wrist, elbow, and shoulder. You will also do exercises to improve fine motor control and dexterity of the hand. Some of the exercises you'll do are designed get your hand working in ways that are similar to your work tasks and sport activities. Other exercises will work your elbow in ways that are similar to your work tasks and sport activities. Your therapist will help you find ways to do your tasks that don't put too much stress on your elbow.

You may require therapy for two to three months. It could take four to six months to get back to high-level sports and work activities. Before your therapy sessions end, your therapist will teach you a number of ways to avoid future problems.

Notes