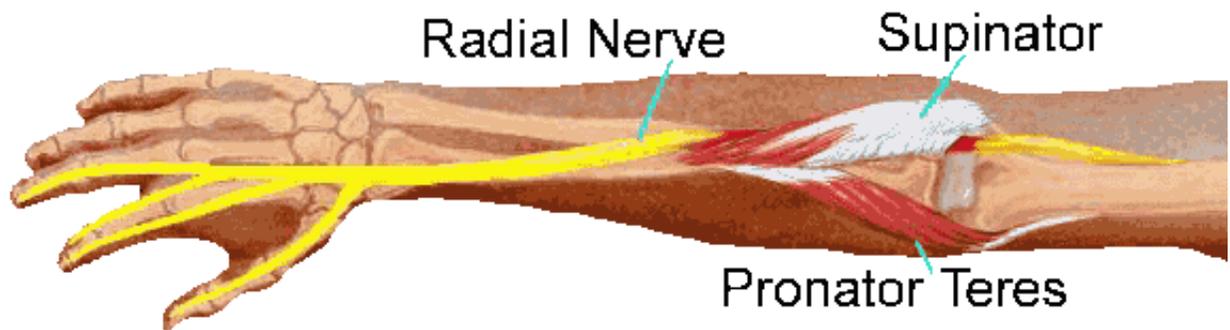


# Radial Tunnel Syndrome

**Introduction** Radial tunnel syndrome is a condition that can cause aching in the forearm just below the elbow. The symptoms of radial tunnel syndrome can be confused with lateral epicondylitis - or tennis elbow. Radial tunnel syndrome can be difficult to diagnose because the tests that are available to look for the problem are not very accurate. This means that your doctor must rely mostly on the history that you give and the physical exam to make the diagnosis.

**Anatomy** The radial nerve actually starts at the side of the neck, where the individual nerve roots exit the spine through small openings between the vertebra called foramen. The nerve roots then join together to form three main nerves that travel down the arm to the hand. The radial nerve is one of those nerves. The radial nerve runs behind the arm crosses the elbow on the outside as it travels down the forearm into the hand.



At the outside (lateral) portion of the elbow, the radial nerve travels in a tunnel that is formed by the surrounding muscles and bone. The nerve actually runs below the muscle that allows you to twist the hand clockwise, like when you try to use a screwdriver to tighten a screw. This muscle is called the supinator muscle. Once the radial nerve goes under the supinator muscle it branches out to attach to the muscles on the back of the forearm.

**Causes** There are actually several places along this tunnel that the radial nerve can become pinched. If the tunnel is too small for any reason, the nerve can be squeezed and begin to cause pain. Repetitive forceful pushing and pulling, bending of the wrist, gripping and pinching further stretch and irritate the nerve. Sometimes a direct blow to the lateral side of the elbow may injure or damage the radial nerve. Constant use of the arm for twisting activities - such as might be found on an assembly line - can cause irritation on the radial nerve and lead to radial tunnel syndrome.

**Symptoms** The symptoms of radial tunnel syndrome include tenderness and pain at the lateral side of the elbow. Although the cause is different, the symptoms of radial tunnel syndrome are very similar to lateral epicondylitis, or tennis elbow. The symptoms of radial tunnel syndrome get worse with using the arm - just like tennis elbow. The

pain is on the outside of the elbow - just like tennis elbow. The one difference is that the place where the elbow is most tender is slightly different. In tennis elbow, the tenderness is mostly right where the tendon attaches to the lateral epicondyle of the elbow. In radial tunnel syndrome the place that is most tender is about two inches further down the arm, right over where the radial nerve goes into the supinator muscle. Your doctor can perform certain tests that may help to determine which problem is causing your pain.

**Diagnosis** The diagnosis of radial tunnel syndrome can be difficult. Many cases are initially thought to be lateral epicondylitis, or tennis elbow. A careful history and physical examination that pinpoints the area of maximal tenderness is probably the best way to make a diagnosis. There are electrical tests available to test the radial nerve, such as the Electromyogram (EMG) and the Nerve Conduction Velocity (NCV). The EMG is done by testing the muscles of the forearm that the radial nerve controls. Special instruments can be used to determine if the muscles are working properly or not. If the muscles are not working properly, then the nerve may be working poorly. (This is similar to checking to see if the wiring on a lamp is faulty by plugging in a new light bulb. If you know that the bulb is good and it doesn't work, then something must be wrong with the wiring!) The NCV actually measures the speed of an electrical impulse as it travels down the radial nerve. If the speed is too slow, then the nerve must be pinched. These electrical tests are not very accurate in determining whether people have radial tunnel syndrome or not. The tests don't show abnormalities in many patients that have radial tunnel syndrome. Most surgeons do not rely on these tests alone to make the diagnosis!

**Treatment** The treatment of radial tunnel syndrome can be frustrating. The primary treatment is avoiding the repetitive and excessive activity that caused the problem to begin with. Wearing a splint on the affected arm for a several days may rest the muscles and allow the nerve to recover from the irritation and pressure. It is important to modify the worksite or the demands of the job if the condition is to be treated successfully. Problems can be avoided by taking frequent breaks as you work or play, improving overall arm muscle condition, and limiting heavy pushing, pulling or grasping.

Anti-inflammatory medications such as aspirin or ibuprofen may be suggested to decrease the inflammation and relieve pain.

If none of these things help to relieve your pain, surgery may be suggested. Surgery is not always successful at relieving the symptoms of radial tunnel syndrome and probably will only be suggested as a last resort. The surgery that is done for radial tunnel syndrome is primarily to relieve any abnormal pressure on the nerve as it crosses the elbow in the radial tunnel. The surgery is performed by making an incision on the outside of the elbow near the area where the radial nerve travels into the forearm. Since there are several places the nerve can be trapped as it crosses the elbow, the nerve is located above the elbow and followed surgically down into the forearm. Any areas that appear to be pinching the nerve are released

to remove the pressure on the nerve. At the end of the procedure the skin is repaired with sutures and allowed to heal.

This surgery can usually be done as an outpatient. The surgery can be done using a general anesthetic (where you are put to sleep) or some type of regional anesthetic. A regional anesthetic is a type of anesthesia where the nerves going to only a portion of the body are blocked. Injection of medications similar to novocaine are used to block the nerves for several hours. This type of anesthesia could be an axillary block (where only the arm is asleep).