

Carpal Tunnel Syndrome

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Introduction

Carpal tunnel syndrome (CTS) is a common problem affecting the hand and wrist. Symptoms begin when the median nerve gets squeezed inside the carpal tunnel of the wrist, a medical condition known as nerve entrapment. Any condition that decreases the size of the carpal tunnel or enlarges the tissues inside the tunnel can produce the symptoms of CTS.

This syndrome has received a lot of attention in recent years because of suggestions that it may be linked with occupations that require repeated use of the hands, such as typing on a computer keyboard or doing assembly work. Actually, many people develop this condition regardless of the type of work they do.

This guide will help you understand

- where the carpal tunnel is located
- how CTS develops
- what can be done for the condition

Anatomy

Where is the carpal tunnel, and what does it do?

The carpal tunnel is an opening through the wrist to the hand that is formed by the bones of the wrist on one side and the transverse carpal ligament on the other. (Ligaments connect bones together.) This opening forms the carpal tunnel.

The median nerve passes through the carpal tunnel into the hand. It gives sensation to the thumb, index finger, long finger, and half of the ring finger. It also sends a nerve branch to control the thenar muscles of the thumb. The thenar muscles help move the thumb and let you touch the pad of the thumb to the tips each of each finger on the same hand, a motion called opposition.

The median nerve and flexor tendons pass through the carpal tunnel. The median nerve rests on top of the tendons, just below the transverse carpal ligament. The flexor tendons are important because they allow movement of the fingers, thumb, and hand, such as when grasping. The

tendons are covered by a material called tenosynovium. The tenosynovium is a slippery covering that allows the tendons to glide next to each other as they are worked.

Related Document: A Patient's Guide to Hand Anatomy

Causes

What causes CTS?

Any condition that makes the area inside the carpal tunnel smaller or increases the size of the tissues within the tunnel can lead to symptoms of CTS. For example, a traumatic wrist injury may cause swelling and extra pressure within the carpal tunnel. The area inside the tunnel can also be reduced after a wrist fracture or dislocation if the bone pushes into the tunnel.

Any condition that causes abnormal pressure in the tunnel can produce symptoms of CTS. Various types of arthritis can cause swelling and pressure in the carpal tunnel. Fractured wrist bones may later cause CTS if the healed fragments result in abnormal irritation on the flexor tendons.

Other conditions in the body can produce symptoms of CTS. Pregnancy can cause fluid to be retained, leading to extra pressure in the carpal tunnel. Diabetics may report symptoms of CTS, which may be from a problem in the nerve (called neuropathy) or from actual pressure on the median nerve. People with low thyroid function (called hypothyroidism) are more prone to problems of CTS.

The way people do their tasks can put them at more risk for problems of CTS. Some of these risks include

- force
- posture
- wrist alignment
- repetition
- temperature
- vibration

One of these risks alone may not cause a problem. But doing a task that involves several factors may pose a greater risk. And the longer a person is exposed to one or more risks, the greater the possibility of having a problem with CTS. However, scientists believe that other factors such as smoking, obesity, and caffeine intake may actually be more important in determining whether a person is more likely to develop CTS.

Surgery

If all attempts to control your symptoms fail, surgery may be suggested to reduce the pressure on the median nerve. Several different surgical procedures have been designed to relieve pressure on the median nerve. By releasing the pressure on the nerve, the blood supply to the nerve improves, and most people get relief of their symptoms. However, if the nerve pressure has been going on a long time, the median nerve may have thickened and scarred to the point that recovery after surgery is much slower.

Open Release

The standard surgery for CTS is called open release. Open surgical procedures use a large skin incision. In open release for CTS, a sizeable incision is made down the front of the wrist and palm, usually about two inches long. By creating a large incision, the surgeon is able to clearly see the wrist structures and to carefully do the operation. The surgeon cuts the transverse carpal ligament in order to take pressure off the median nerve.

After dividing the transverse carpal ligament, the surgeon stitches just the skin together and leaves the loose ends of the transverse carpal ligament separated. The loose ends are left apart to keep pressure off the median nerve. Eventually, the gap between the two ends of the ligament fills in with scar tissue.

Related Document: [A Patient's Guide to Open Carpal Tunnel Release](#)

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