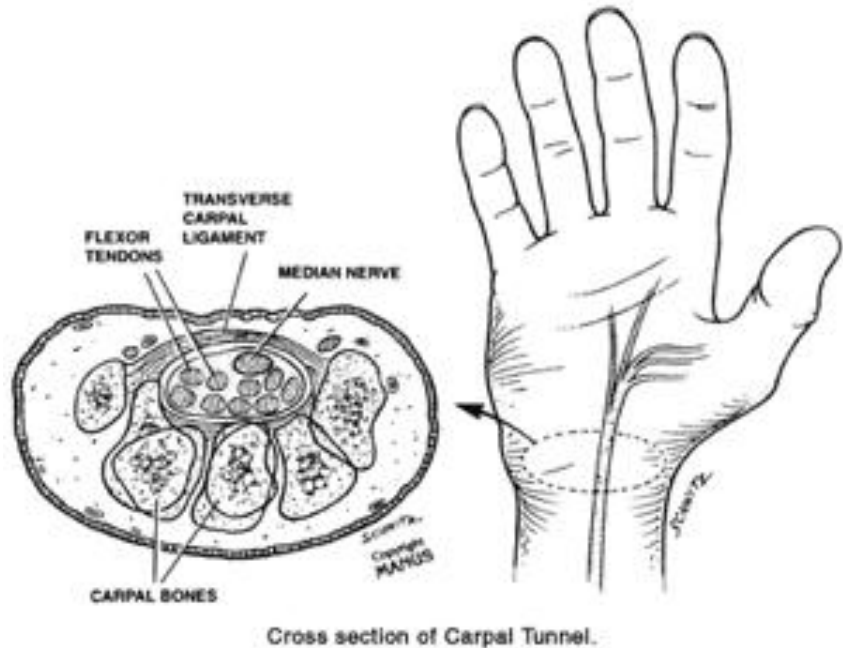


## Carpal Tunnel Syndrome By Garry S. Kitay, M.D.

Carpal tunnel syndrome has become the most common condition treated by hand surgeons. This is a disease that usually involves an abnormal compression of the median nerve, one of the two major nerves, at the level of the wrist. This can be caused by a variety of mechanical, vascular, or metabolic disorders. The median nerve normally provides sensation to the palm and the majority of the digits, as well as strength for thumb positioning and grasp. In carpal tunnel syndrome, each of these functions may be compromised.



### **Etiology**

The carpal tunnel, or canal, is an anatomic passageway whose the arched floor is composed of the small bones of the wrist, and whose the ceiling is formed by a tough ligament, the transverse carpal ligament. The tunnel contains nine flexor tendons that travel to the digits, and the median nerve which lies directly beneath the transverse carpal ligament. Any condition that increases the volume of the contents within the carpal tunnel, or decreases the tunnel space, can lead to excessive pressure on the median nerve and its disease, also called carpal tunnel syndrome. For instance, wrist fractures and dislocations commonly diminish the size of the canal. Alternatively, fluid retention, as seen in pregnancy, will increase the contents of the canal and can lead to carpal tunnel syndrome. There is strong evidence that certain occupations are related to carpal tunnel syndrome. Tasks that require repetitive and forceful gripping are particularly implicated.

## **Diagnosis**

The typical patient will complain of numbness, burning, or tingling into the thumb, index, middle and half of the ring finger. The symptoms often occur at night and can awaken the patient from sleep. At times, there is an aching pain over the region of the palm which can extend up the elbow and even as far up as the shoulder. In an advanced state, carpal tunnel syndrome can cause diminished sensation, clumsiness, and the tendency to drop objects. On examination, there are several provocative tests that are performed that establish a hypersensitivity, or irritability, of the carpal tunnel nerve. One simple test involves tapping directly over the nerve. If this causes tingling into the thumb through ring fingers, this is considered a positive test and is certainly consistent with a diagnosis of carpal tunnel syndrome.

Nerve conduction studies are helpful in confirming the diagnosis. This test is performed with a special device that measures the conduction of signals along the median nerve as it travels through the carpal tunnel. In carpal tunnel syndrome, the normal conduction of nerve signals are slowed and may even become absent in severe disease. Whenever carpal tunnel syndrome is suspected other conditions that can cause similar symptoms are considered as well. These include "pinched nerves" in the neck or arm.

## **Treatment**

Most patients with carpal tunnel syndrome can be improved with conservative therapy. This involves splinting the wrist in slight extension to minimize the pressure on the carpal tunnel. The splint needs to be worn usually at least three weeks for the symptoms to resolve, and should remain on throughout the workday and at night. A steroid preparation may also be injected into the carpal tunnel which can decrease inflammation and swelling. This injection can be repeated, and will generally provide relief. Surgical treatment is recommended for those patients who fail conservative therapy or who have severe disease. This surgery is performed on an outpatient basis, and can be performed either endoscopically or with an open incision. After surgery, the patient can expect soreness for approximately four to six weeks and some discomfort about the palm which can last longer. However, the symptoms of carpal tunnel are usually fully relieved, and full activities are possible, four to six weeks following surgery. The great majority of patients are very pleased with their outcome and the relief of their pain and numbness.

## **Summary**

Carpal tunnel syndrome is a very prevalent disease which is due to compression of the median nerve at the wrist. It can often be cured with conservative therapy. However, in more serious cases, surgical options are available which can relieve the symptoms and permit patient to return to their normal function and occupation.