

Ask the Doctor: Carpal Tunnel Syndrome

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Introduction

It's a phrase that has become increasingly familiar to everyone over the past decade. Some say it has become an epidemic among people who use their hands intensely in a variety of occupations and leisure pursuits. It is a subject of textbooks, articles in medical and other journals, conferences and debates. It has often been mis-named, misunderstood, and occasionally mis-treated. In these next paragraphs, I'd like to help explain, clarify and demystify it; as a hand surgeon and orthopaedist, I've treated this condition for more than 35 years.

What is it?

As its name implies, carpal tunnel syndrome (henceforth, CTS) is a specific collection of specific symptoms arising from a very specific cause. When the *median nerve* is compressed (pinched, squeezed) as it passes from the front of the wrist, through a 1.5 inch long rigid tunnel, into the palm of the hand, it produces certain symptoms. This collection of symptoms is known as *carpal tunnel syndrome*, and it can result from a number of different conditions. Here are some helpful facts:

There are many causes of median nerve compression at the wrist. Perhaps the most common one occurs during the last months of pregnancy, a time when the body retains fluid. This fluid also accumulates in the fixed area inside the carpal tunnel, where it produces pressure on the nerve and the nine tendons that accompany it. Only the nerve is adversely affected by this pressure, which usually lessens after the woman has given birth.

Nerve pressure may also result from swelling, thickening or enlargement of the coverings around the tendons in the carpal tunnel; this condition increases the volume of tissue to a level that may give rise to nerve symptoms. Specific conditions that can cause this type of enlargement include inflammation of the tendon sheath as seen in rheumatoid arthritis, inflammation as a result of forceful and/or repetitive hand and wrist activities (overuse), as a complication of some types of wrist fracture, and by certain kidney and thyroid diseases. Many sufferers, however, cannot describe a specific cause for their CTS. This group, composed primarily of women 35-70 years of age, has developed symptoms without any obvious risk factors, and the cause of their condition is described by the medical term *idiopathic*.

Much has been written about CTS being caused by using keyboards (both office and musical), but in reality this is not as common a cause as some of those mentioned above. In my personal series of instrumentalists seen and treated over a 15-year period, only 18 of the 98 performers diagnosed with CTS could attribute their symptoms to making music; in fact, two-thirds of this group were found to have idiopathic CTS. The double reed musician is less likely to experience music-related nerve pressure than many other instrumentalists. Perhaps the greatest potential problem in this regard is using prolonged, excessive flexion of the right wrist while playing the bassoon without a crutch.

The most common symptom of CTS is a feeling of numbness or tingling in the thumb, index (pointer) and long (middle) fingers, often extending back into the palm. It frequently is described as being worse at night, and may be aggravated by keeping the affected wrist in a flexed position. Many patients say that activities such as driving a car, sewing, reading, or holding a telephone make their symptoms worse. Extending the wrist and dropping the hand below waist level often relieves at least some of the numbness. Symptoms may involve one or both hands, usually begin insidiously, and progress or worsen slowly over a period of many months or years. These *sensory* symptoms are the result of pressure on the nerve fibers that conduct sensation back from the fingers to the brain; other fibers, conducting in the reverse direction, supply *motor* functions which cause muscle contractions. Motor symptoms, including weakness in pinch or a feeling of clumsiness for fine hand actions, are rarely seen early in the course of CTS, but their appearance indicates a greater degree of compression.

Physical signs of CTS are limited to the small muscles at the base of the thumb. In severe cases, these muscles may lose much of their motor nerve supply and shrink, or *atrophy*. The normal convex shape of the muscle mass becomes flattened or concave, a condition that is especially noticeable to the patient or the examining physician when compared to a normal opposite hand.

How is it diagnosed?

Diagnosis first begins with a personal recognition that the symptoms may indicate something is wrong with one's hand or fingers. If the symptoms resemble those that I've described in previous paragraphs, and

if they persist more than a few days despite changing some patterns of hand use, it's time to seek professional help.

The examining physician should take a thorough medical history of the specific hand problem, as well as other important contributing factors; for women, an obstetrical history may yield specific useful details. The patient should be equally thorough and truthful in giving answers and information which, at first glance, may not seem pertinent to the problem at hand (pun - sorry!). Following the interview, a physical examination of the affected hand(s) and the entire upper extremity, in addition to other appropriate systems, should be performed. The exam includes several tests of nerve function, including those of sensation for pain and light touch, as well as an evaluation of hand muscle strength. Equally important to the examiner is watching the performer play his/her instrument, if musical performance is considered as a possible cause of the problem.

Many patients with CTS or other nerve compression problems will be referred to a specialist for electrical studies of the nerves in the hand and arm, which can help in determining the exact location and extent of nerve compression. These tests include *nerve conduction velocity* (NCV) testing and *electromyography* (EMG) of the muscles supplied by the nerves. For others, a therapist or other specialist may perform a *vibrometry* test to evaluate the sensory function of the nerve. The result of these tests will help the physician determine the most effective treatment plan for a specific patient.

What can be done about it?

The specific treatment of CTS will depend to a great extent on its cause. For those patients whose difficulty is caused by a specific forceful, repetitive movement, modifying the offending job techniques and ergonomics may be the best primary treatment. The pregnant woman with CTS may benefit from dietary salt restriction and other non-drug therapies, knowing that her symptoms likely will resolve after delivery of her child. Overhead hand positions while sleeping, if implicated in the production of symptoms, can be altered in a variety of ways. Certainly, treatment of any contributing medical condition or disease must be undertaken.

Many people find that using a small, lightweight wrist splint at night or while performing certain activities can reduce finger tingling and pain, by preventing the wrist from assuming a troublesome flexed position. These splints are inexpensive and may be prescribed by the examining physician; in other cases, patients may choose to purchase them directly from a well-equipped pharmacy.

Hand therapy may be useful for some people with

this problem. If a CTS sufferer also is found to have tight muscle-tendon units that incompletely move or glide across the wrist, corrective stretching and mobilization exercises can be taught and practiced regularly. These can decrease tightness and restriction about the nerve which accompanies these tendons in the carpal tunnel. Another simple and readily available technique is taking frequent breaks from any activities that force the hand and wrist to be held still for prolonged periods; encouraging normal motions and relieving stiffness is especially useful for those who must sit at a keyboard all day long.

Not every person with CTS will get relief from these conservative methods. Some will notice a worsening of their condition despite treatment, and a few will already have developed a severe degree of compression, perhaps with early nerve damage. For these patients, surgery to relieve the nerve compression may be the best option. The procedure is performed frequently by surgeons trained in its techniques, can be done in an out-patient setting under local or regional anesthetic, and normally takes less than a half hour. Depending on the surgeon's preference, the decompression may be done by traditional, open techniques which permit the surgeon to see the nerve and verify complete release, or by endoscopic techniques using smaller incisions and usually allowing the patient to return to activities a couple of weeks sooner. In all cases, however, finger movements can (and should) be started immediately after the surgery, and a special surgical dressing may even permit a partial return to music within a week. Obviously, each patient who is considering surgery must discuss thoroughly all aspects of the procedure, recovery and rehabilitation with her/his surgeon before making a decision. From my personal experience, I can say that CTS release has been one of the most gratifying operations I have performed; recovery in 90-plus percent of my patients has been rapid and complete or nearly so, with minimal pain or discomfort and with few people needing prolonged therapy. Although any surgery should not be taken lightly, most people with CTS who need surgery are advised to have it sooner, not later.

Suggested readings:

- Dawson WJ: Nerve compression problems—arts medicine for the double reed player. *The Double Reed* 1992;15(1):56-58.
- Dawson WJ: Carpal tunnel syndrome in instrumentalists: A review of 15 years' clinical experience. *Medical Problems of Performing Artists* 1999;14(1):25-29.
- Grosklos HJ: A flutist's understanding of carpal tunnel syndrome. *Flutist Quarterly* 1998;23(3):28-31.