Carpal Syndrome Tunnel

Cedar Valley Hand Surgery
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Carpal Tunnel Syndrome is a common condition that causes numbness and tingling in the hand. It is the most common nerve compression problem in the upper extremities.

This condition affects women more than men, and is most common between the ages of 40 and 60.
Anatomy

- The carpal tunnel is a rigid space found at the wrist.
- It contains nine tendons that connect forearm muscles to bones in the hand.
- It contains one **nerve**, called the median nerve.

This picture is a cross section of the wrist.
Anatomy

- The median nerve supplies sensibility, or feeling, to the thumb, index finger, long finger, and one-half of the ring finger.
- The other half of the ring finger, and the small finger, are not involved.
The Problem

- Carpal tunnel syndrome occurs when the size of the carpal tunnel decreases, or the size of the tunnel contents increases.
- Swelling around the tendons is a common way for the tunnel contents to increase.
- This increases pressure in the space of the carpal tunnel.
- Pressure applied to the nerve reduces blood supply to the nerve, resulting in symptoms.
Symptoms

- Numbness or tingling in the hand is usually the predominant symptom.
- This is most often worse at night, and frequently wakens patients at night.
- Pain may occur, and can radiate from the hand to the shoulder.
- The hand and fingers often feel swollen.
- Patients often feel like they are going to drop objects.
Symptoms

- Symptoms can be brought on by reading
- Symptoms occur while using a telephone
- Symptoms are often noticed while driving
Diagnosis

- The diagnosis is usually made by history and physical examination.

- Electrophysiologic testing (EMG) is usually obtained to confirm the diagnosis. This test is done by a neurologist.

- The EMG confirms the diagnosis, evaluates how severe the condition is, and helps to rule out other conditions.
EMG testing is done by a neurologist. The test uses electrodes and needles to determine nerve function.
EMG Testing
Associated Conditions

Carpal tunnel syndrome is more common in people with these problems:

- Diabetes
- Thyroid Disease
- Rheumatoid arthritis
- Pregnancy
- Injury (like wrist fractures)
- Gout
- Anatomic abnormalities in the carpal tunnel space such as wrist arthritis or soft tissue cysts
In most cases, non-surgical treatment is employed first. Many patients are able to resolve this condition without surgery.

Severe cases of carpal tunnel syndrome may not be good candidates for this treatment.
Non-Surgical Treatment

- A **splint**, worn primarily for **sleeping**, is the mainstay of non-surgical treatment.
- The splint can be worn for daytime activities, including work, if it is helpful.
Treatment

- Anti-inflammatory medications (Advil, etc.) may reduce swelling in the carpal tunnel.

- Patients on blood thinners, with asthma, or with stomach ulcer disease may not be able to take anti-inflammatory medicines.

- Prescription anti-inflammatory medications are available for patients with sensitive stomachs, and offer once-a-day dosing.
Vitamin B6

- **Vitamin B6** provides relief in many patients. The mechanism for this is unknown, however the recommended dose is **50 mg twice a day**. This is more than is contained in a multi-vitamin.

- B-Complex vitamins should contain 50 mgs of B6.
Anti-inflammatory medicines and vitamin B6

- These two measures have not been shown to measurably affect the outcome of carpal tunnel syndrome in scientific studies.
- They do seem to benefit many patients, but again without proven effect or scientific basis.
Wrist exercises have been proven to be effective. The exercises should be done slowly and gently for several minutes twice a day. The premise is to effect nerve gliding of the median nerve in the carpal tunnel.
Is Carpal Tunnel Syndrome Work-related?

- The exact relationship of carpal tunnel syndrome to work activities remains unknown. Studies have not been able to prove that any job specifically causes carpal tunnel syndrome.

- Generally, any job that involves frequent or repetitive gripping, grasping or pinching, or that involves frequent or repetitive motion of the fingers or wrist is considered to be an aggravating factor. This would make carpal tunnel likely to be work-aggravated.
Work Recommendations

- Most recommendations are based on empiric ideas, and are not proven.
- Telephone headsets greatly reduce strain in individuals who use a phone frequently.
- Rotation of job positions may be helpful.
- Padding tools, or new tool designs can be considered.
- Many therapists and occupational physicians are trained to make ergonomic studies of work stations.
Keyboard Stations

- Keyboards should be positioned so that the arms are relaxed, the elbows in mild flexion.
- Gel supports for keyboard and mouse may help.
- Feet should be comfortably resting on the floor.
Treatment – Cortisone

- If symptoms persist despite these measures, a cortisone injection can be given into the carpal tunnel.
- The injection coats the tendons in the tunnel with cortisone to decrease swelling.
Cortisone injections help most people, but long-term relief is only 10%.

Cortisone will make blood sugar levels rise in diabetics for one to two days.

Cortisone is often used in pregnant patients with carpal tunnel syndrome.
Cortisone Injection
Cortisone Injection

- A thin needle is inserted into the carpal tunnel
- The tendons are coated with the cortisone compound
Surgery may be indicated when symptoms continue despite non-surgical treatment.

Surgery is done as an outpatient procedure in a hospital operating room.

The goal of surgery is to increase the volume of the carpal tunnel.
Surgery

- Anesthesia choices include an arm-block done by an anesthesiologist, or simple local anesthetic done at the wrist.

- The arm block, or Bier Block, is more comfortable. It requires IV’s to be placed, but allows for relaxing medication to be given.

- The simple local is done without use of IV’s, or relaxing medication
Bier Block Anesthesia

Injecting anesthetic
The goal of carpal tunnel surgery is to cut or release the transverse carpal ligament so that the volume of the carpal tunnel increases in size.

MRI studies have shown that the size of the carpal tunnel is increased 25% by this surgery.

There are two common ways to do the surgery – open visualization or with an endoscope.
Endoscopic Surgery

- Surgery can be done with the use of an endoscope.
- This allows for a smaller scar and a faster return of strength.
- This technique is more expensive because of equipment charges.
- The nerve is not seen with this technique.
- Rarely, the visualization is not adequate, and a second incision is made at the same time for the open technique.
Limited Incision Surgery

- This is the technique used in our office.
- The transverse carpal ligament is cut under direct vision.
- The nerve is able to be visualized at surgery.
Carpal Tunnel Surgery

Median Nerve
Surgery

Cutting the transverse carpal ligament increases the size of the carpal tunnel.

Increasing the volume of the carpal tunnel eases pressure on the nerve and increases blood flow to the nerve.

The ligament will heal again after surgery.

Click on the carpal tunnel to the right.
This dressing is worn for one week after surgery.
Use plastic bags to cover the dressing for showering or bathing.
Light activity is good – such as picking up books or plates, buttoning, using remotes.
After Surgery

- Finger exercises are done slowly and gently
- The distance the fingers move is what is important
- The hand should be elevated for several days to decrease swelling
Risks of Surgery

- The overall success rate of carpal tunnel surgery is 80 to 85%.
- Risks include infection. Damage to nerve, tendon, or blood vessel.
- Painful scar.
- Recurrence of carpal tunnel syndrome is rare, and the reoperation rate is 3%.
Surgery

- The area around the scar may stay swollen and tender for 6 months
- Grip and grasp strength usually requires 6 months to return fully, and requires consistent exercise
If you have questions after watching this presentation, please let us know