CARPAL TUNNEL SYNDROME INFORMATION

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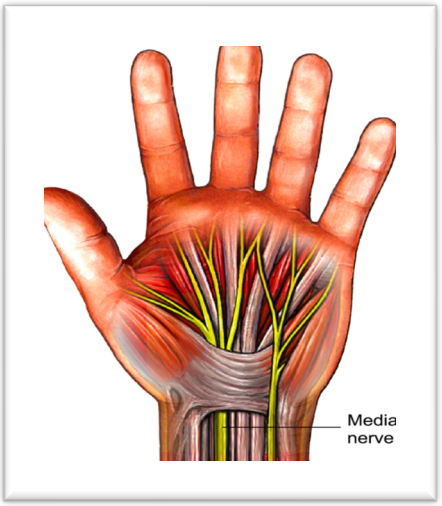
What is the carpal tunnel?

At the base of the hand, there is a ligament called the transverse carpal ligament or also known as the flexor retinaculum (see diagram below). A large nerve (the median nerve) and all the tendons that bend the fingers and thumb pass underneath this ligament on their way from the forearm into the hand.

The space below the ligament is known as the carpal tunnel. The median nerve supplies sensation to the fingers, and some of the hand muscles (diagram below).



The palm of the hand, showing the median nerve running beneath the flexor retinaculum

The median nerve sensory supply to the hand is outlined in BLUE

What is carpal tunnel syndrome?

Carpal tunnel syndrome (CTS) is a condition where the median nerve is compressed as it passes through the carpal tunnel. When it is compressed, the nerve starts to malfunction, producing symptoms.

What are the symptoms of carpal tunnel syndrome?

- **Tingling and numbness in the hand** - This affects the part of the hand supplied by the median nerve (see picture), and often feels like the whole hand is tingling.
- **Night time symptoms** - Symptoms tend to wake people from sleep, and many people find that hanging their hand out of the bed or shaking it will relieve the symptoms.
- **Difficulty with fiddly tasks** - As the condition gets worse, the numbness and tingling can become constant with altered sensation in the hand and inability to feel things properly.
- **Weakness of pinch grip** - When the condition becomes severe, then the muscles of the thumb can become weak, making pinch grip less secure. Visit our website to find out if your symptoms might be due to carpal tunnel syndrome.

Who gets carpal tunnel syndrome?

Anything that affects the size of the carpal tunnel may cause the symptoms of carpal tunnel syndrome. As people age, the cartilage over the bones of the wrist is worn away, and the ligament tends to become stiffer. These changes can be enough to cause the condition.

People in their 50s are most likely to develop CTS, and women are particularly prone around menopause, possibly from changes to hormone levels.

Other things, such as diabetes, underactive thyroid, arthritis and trauma can also contribute to CTS.

How is it diagnosed?

In many cases the diagnosis can usually be made based on patient symptoms and examination.

There are two tests used by surgeons to help make the diagnosis:

Phalen's test is a simple manoeuvre where the wrist is allowed to flop down with gravity when the elbow is on a table.

This manoeuvre increases the pressure within the carpal tunnel and in patients with carpal tunnel syndrome, this will give rise to tingling in the area supplied by the median nerve.

Phalen's Test – Tingling in the fingers within around 1 minute is a positive test.

Tinel's sign involves lightly tapping over the nerve to detect an area of irritation. This will produce a tingling sensation in the hand if the test is positive.

A test to measure nerve impulses (nerve conduction study) will usually confirm the diagnosis, and give an idea as to how severe the problem is. This study involves a doctor or specialist technician placing some sticky pads on the arm and measuring the speed taken for signals to be

transmitted down the nerve. It can feel uncomfortable but is not usually painful.

What is the natural history?

In many patients, symptoms from carpal tunnel syndrome can come and go for some time before either settling down or becoming a problem. If there is an underlying cause such as diabetes or thyroid disease, pregnancy, or even menopause in women, then treating this condition may help resolve symptoms.

CTS due to pregnancy often will get better after the baby is born.

If there has been a trigger such as a work related or sporting activity then making changes to these activities can help settle symptoms. If the condition continues to worsen, there is a risk of losing function in the hand, with the median nerve not working.

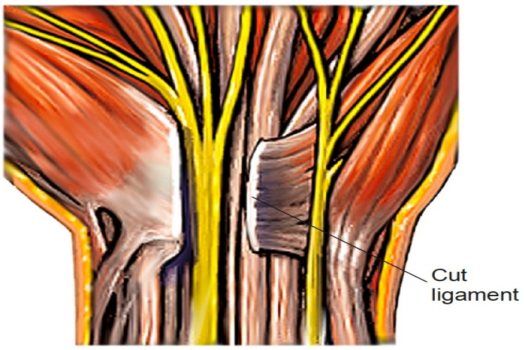
This gives a permanent numbness in the hand, and weakness of thumb movement. People worry about deterioration of function, but it usually goes hand in hand with symptoms, so that there is usually plenty warning of deterioration in the function of the median nerve.

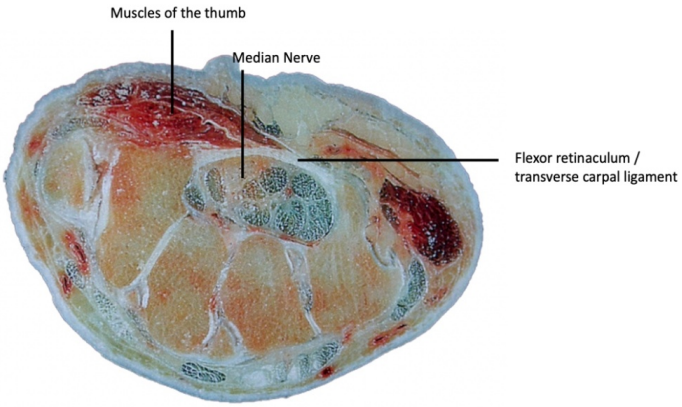
What is the treatment?

1) **Splinting –** A wrist splint with the wrist in a straight position is usually the first step in treatment. The splint should be worn for 2-3 months, usually at night. Activities which provoke the symptoms should be avoided if possible.
2) **Steroid Injection –** A steroid injection into the carpal tunnel may be useful in selected patients. Steroid is thought to work by reducing any inflammation within the carpal tunnel, but is also known to breakdown fat and connective tissue, leaving more space within the tunnel. Steroid injection is often recommended if nerve studies show that the condition is very mild, or if there are

reasons why surgery to the hand would cause problems at work or for other reasons.

3) **Surgery –** Surgery remains the most effective, proven long-term solution to Carpal Tunnel Syndrome. The operation involves cutting the ligament over the front of the wrist to ease the pressure on the nerve. The surgery is routinely done under local anaesthesia.





Cross section of the carpal tunnel

For more information about carpal tunnel surgery please visit our website www.fifevirtualhandclinic.co.uk . Here you will also find information on where to buy a wrist splint and on steroid injection. Surgery usually cures the problem. Night pain and tingling usually disappear within a few days. In severe cases, constant numbness and muscle weakness may be slow to get better or may not be much better than before surgery. Occasionally pain can be felt over the inside of the wrist. It generally takes about three months to get back full strength and a comfortable scar.

The hand can be used for light activities from the day of surgery. Although surgery is a relatively safe option with excellent one year outcomes, there is a price to pay. Since the surgeon divides the ligament

at the front of the wrist (flexor retinaculum / transverse carpal ligament), the normal function of this ligament is lost.

There are 3 consequences of losing the ligament:

1) The wrist joint loses one of its stabilising ligaments. This can result in a feeling of instability when using the hand for anything heavy, or a dull ache across the base of the hand when pushing up from a chair or bath. In patients with pre-existing arthritis of the wrist, arthritic symptoms can be exacerbated by loss of the ligament. These symptoms improve with time and are generally not an issue at the one year follow up.
2) The flexor tendons (tendons responsible for grip) lose one of the 'pulleys' used to increase their efficiency. Loss of the ligament usually results in loss of grip strength, although this recovers over the course of around one year, and is usually normal in the long term.
3) The small muscles of the hand that work the thumb and little finger normally pull from the ligament. When the ligament is divided, these muscles immediately pull on something unstable, making pinch grip difficult for the first few weeks. Again, this tends to improve with time and returns to normal within a year.

Overall, the results of open carpal tunnel decompression are excellent with around 96% of patients reporting good outcomes at one year. There are risks involved with all surgery, however, and you can read more about these risks on our website www.fifevirtualhandclinic.co.uk in the general information section.