

Carpal Tunnel

Definition

Carpal tunnel syndrome is a **compression neuropathy** of the median nerve at the wrist.

Causes

Carpal tunnel syndrome is caused by **increased pressure within the carpal tunnel** that causes compression of the median nerve. This causes a **reduction in blood flow and oxygen** to the nerve. Nerve dysfunction leads to pain and numbness at night and constant weakness when severe. **Carpal tunnel syndrome is usually idiopathic** meaning a cause is never found but wrist trauma can cause similar median nerve swelling, leading to carpal tunnel syndrome. Other conditions associated include diabetes, thyroid dysfunction, pregnancy and autoimmune disorders such as rheumatoid arthritis.

Risk Factors

It is common, affecting over **3% of the population**. Risk factors include age, body mass and being female. Certain activities, including work, may exacerbate your symptoms.

Symptoms

Symptoms include:

- **Waking up at night due to numbness in the fingers;**
- Pins and needles or numbness in the fingers when driving;
- Pain in the wrist that radiates to the fingers and sometimes up the arm.

Trigger finger or thumb is common in people who have carpal tunnel syndrome and can be treated at the same time.

Diagnosis

Carpal tunnel syndrome can be **diagnosed clinically**, with a combination of history and examination, however **nerve conduction studies have become common** place as they provide objective findings and help evaluate other possible causes of nerve dysfunction. They **can be falsely positive** in up to 16% of cases. Evidence for the use of ultrasound and MRI is increasing but its routine use is not recommended.

Examination findings include:

- Numbness in the fingers supplied by the median nerve (thumb, index, middle and half the ring finger);
- Muscle weakness or wasting in the abductor pollicis brevis (a thumb muscle innervated by the median nerve after the carpal tunnel);
- Positive Tinel sign;
- Positive Phalen's or Durkan's test.

Treatment

Nonoperative management includes splinting and a cortisone injection. Both lead to a reduction in the pressure within the carpal tunnel, increased blood flow and improved function of the median nerve. A comparison showed that patients treated with a cortisone injection performed better than splinting alone. Neither of these treatments are likely to cure your carpal tunnel syndrome but **may reduce your symptoms and delay an operation.**

Open carpal tunnel release remains the most commonly performed operation. It involves releasing the carpal ligament at the wrist. Night or activity related numbness will usually resolve immediately and sleep quality improves, generally within 24 hours of surgery. Constant numbness and muscle wasting may improve for over 5 years. Numbness resolves in 94% of patients at 9 years. A correlation between mental health scores and worse postoperative satisfaction scores has been shown, but both improved.

An analysis of multiple clinical studies found a reoperation rate of 1.1%, and complication rate of 2.6% for open release and 3.2% endoscopic. These include scar and wrist pain, anaesthetic issues, nerve injury, infection and recurrence.

Operating on both sides at the same time has been shown to be safe but it is difficult to keep both hands dry. Hygiene, opening jars, cooking and household chores may be difficult. The main advantage of endoscopic release is a possible faster postoperative recovery. Studies examining this are challenging as pain is generally low after both techniques.

Prevention

Looking after your health, including the treatment of associated conditions such as diabetes, and reducing body mass, will help prevent carpal tunnel syndrome. Modification of activities that exacerbate your symptoms may also help, including the use of a splint fitted by a hand therapist. If purchasing a splint over the counter, make sure it has a removable metal support. It can be straightened at night, to hold your wrist in a neutral position, reducing the pressure inside your carpal tunnel. It can be extended during the day which is better for functional tasks.

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