Carpal Tunnel Syndrome

Definition: carpal tunnel syndrome from The Macquarie Dictionary

1. a repetition strain disorder of the wrist and hand in which the lining or sheath of the median nerve becomes chronically inflamed as it passes through the carpal tunnel, thus subjecting the nerve to pressure and causing pain, tingling and muscular weakness.

Summary Article: Carpal Tunnel Syndrome from Encyclopedia of Global Health

Carpal tunnel syndrome (CTS) is the most common compressive neuropathy (pressure on a nerve causing symptoms) and is characterized by pain, tingling, numbness, weakness of the fingers, and/or muscle wasting. Anything putting pressure on the median nerve in the carpal tunnel may cause these symptoms. Traditional treatments include antiinflammatory medications, splints, steroid injections, or surgery. Alternative treatments include emu oil, osteopathic manipulative treatment (OMT), acupuncture, and yoga. The prognosis varies and depends upon the severity, but most patients with mild-to-moderate CTS without muscular atrophy (muscle wasting) will respond well to nonsurgical interventions.

Narrowing of the carpal tunnel (through which the median nerve and tendons pass) is the anatomical basis for the disease. The tunnel is comprised of carpal bones on three sides, and the transverse carpal ligament on the other. Factors increasing pressure within the tunnel (and the median nerve) include pregnancy, edema (excess fluid), and inflammatory arthritis, as well as repetitive wrist movements, such as those associated with typing, gardening, and house painting. The elevated pressure causes decreased blood flow to the median nerve, and impairs nerve conduction. CTS is three times more common in females and usually presents after the age of 30.

Patients are commonly awakened at night by painful numbness in the hands that they may try to alleviate by shaking their hand and rubbing their fingers. The fingers commonly affected are the thumb, index, and middle fingers, as they are supplied by the median nerve. Patients also may report dropping objects or weakness of the first three fingers. Daytime attacks usually are elicited by any activity that causes wrist flexion, such as car driving or holding a telephone.

Physical examination may be normal, but in advanced cases, the patient may have weakness and atrophy. Two commonly performed tests include Phalen's maneuver and Tinel's sign. Phalen's maneuver involves holding the patient's wrists in flexion for 60 seconds. A positive test is one that elicits pain or sensory changes in the first three fingers. Tinel's sign is evaluated by tapping on the wrist crease in the area of the median nerve/carpal tunnel. A positive sign causes pain and or sensory changes. An electromyelogram with nerve conduction studies may also be used to determine the health of the nerve.

Common treatments of CTS include nonsteroidal antiinflammatory drugs (NSAIDs), corticosteroids, splinting, and surgery. Splints may be used with other treatments, and many patients report relief within...
days. Nighttime splints prevent wrist flexion, and should be a first-line choice for patients with mild-to-moderate CTS. NSAIDs and corticosteroids treat the inflammation of the median nerve as well as surrounding structures. Corticosteroids are often given as an injection into the region of the carpal tunnel.

Candidates for surgery include patients with constant numbness, symptoms for over a year, or muscle weakness and wasting. The surgery, carpal tunnel release, involves cutting the transverse carpal ligament to increase tunnel size. A patient considering surgery should seek a second opinion to confirm the diagnosis, and choose a capable surgeon who performs many CTS surgeries. Patients who develop CTS during pregnancy should never have surgery, as CTS usually will resolve after childbirth.

Several alternative therapies for the treatment of CTS are available. Osteopathic manipulative treatment (OMT) can elongate the transverse carpal ligament in cadavers, and may be of benefit to patients with CTS as well. These nonthrusting stretching techniques have little risk, can be done at home, and appear to improve symptoms. Many botanicals, including willow bark, St. John’s wort, grape seed extract, arnica, garlic, and flaxseed oil have also been used by patients to treat symptoms of CTS. Results have been mixed, and more data are needed to substantiate claims. Topically applied emu oil has been shown to be helpful in small studies.

Acupuncture for CTS has not been evaluated in a controlled study. One study revealed eight weeks of twice-weekly yoga to be of benefit, with patients demonstrating a significant reduction in pain and improvement in grip strength. Ergonomic therapies may reduce or prevent symptoms of CTS. These techniques involve behavior modification, and use of devices such as an ergonomic keyboard. A multifaceted approach, with identification and removal of precipitating factors, must be taken to successfully treat this condition.

SEE ALSO:
Hand Injuries and Disorders; Occupational Injuries; Peripheral Nerve Disorders; Wrist/Arm Injuries and Disorders.

BIBLIOGRAPHY

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