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Best Practice & Research Clinical Rheumatology

journal homepage: www.elsevierhealth.com/berh



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Carpal tunnel syndrome and work



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A B S T R A C T

Keywords:

Carpal tunnel syndrome
Vibration
Repetition
Occupation
Return to work

Carpal tunnel syndrome (CTS) is the most common peripheral nerve entrapment syndrome, and it frequently presents in working-aged adults. Its mild form causes 'nuisance' symptoms including dysaesthesia and nocturnal waking. At its most severe, CTS can significantly impair motor function and weaken pinch grip. This review discusses the anatomy of the carpal tunnel and the clinical presentation of the syndrome as well as the classification and diagnosis of the condition. CTS has a profile of well-established risk factors including individual factors and predisposing co-morbidities, which are briefly discussed. There is a growing body of evidence for an association between CTS and various occupational factors, which is also explored. Management of CTS, conservative and surgical, is described. Finally, the issue of safe return to work post carpal tunnel release surgery and the lack of evidence-based guidelines are discussed.

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Anatomy of the carpal tunnel

Found at the palmar wrist, the carpal tunnel is defined by the pisiform and hook of the hamate medially and the tuberosities of the scaphoid and trapezium laterally. Thick connective tissue (the flexor retinaculum) covers these four bony prominences, which creates a tunnel for the extrinsic flexor tendons of the digits (flexor digitorum profundus, flexor digitorum superficialis and flexor pollicis longus), maintaining them in place during wrist flexion (Fig. 1). The median nerve is a major peripheral nerve of the upper limb. It runs a course through the lateral and medial cords of the brachial plexus into the anterior compartment of the forearm through the carpal tunnel into the wrist, where it branches to provide motor supply to the thenar muscle group and sensory innervation to the palmar surface of the thumb, index finger, middle finger and lateral half of the ring finger. Carpal tunnel syndrome (CTS) is caused when the tunnel is narrowed or the extrinsic flexor tendons or tendon sheaths swell. Constriction in the carpal tunnel impinges on the median nerve producing symptoms of disturbed sensation in the digits it innervates. Symptoms may progress to wasting and weakness of the thenar muscles, resulting in weakened pinch grip.

Classification and diagnostic criteria

The typical presentation of CTS involves pain and/or dysaesthesia of the fingers (typically the lateral 3½ digits, but it can be diffuse throughout the hand and can radiate proximal to the wrist). Symptoms are often worse at night or in the early morning. Examination in advanced cases may reveal wasting of the thenar eminence and/or weakness of thumb opposition. Provocation tests such as those of Tinel (tapping the flexor retinaculum) and Phalen (full passive flexion of the wrist sustained for 1 min) are widely used as confirmatory tests in clinical practice. The sensitivity and specificity of these tests are excellent (88–100%) in people about to undergo carpal tunnel decompression [1], but when the same tests are performed among patients with dysaesthesia in the general population [2–4], considerably poorer performance is found, at least when the ‘gold standard’ is nerve conduction studies. Similarly, electrophysiological nerve conduction tests have shown good diagnostic sensitivity (60–84%) and specificity of >95% using a standardised cut-off for sensory nerve velocities among patients awaiting decompression where the ‘gold standard’ was operative relief of symptoms [5]. However, nerve conduction testing is not a perfect gold standard; false positives and negatives are well documented [6] and there is currently no consensus as to optimal technique, standardisation or normalisation for factors such as age, sex, height or skin temperature [7,8].

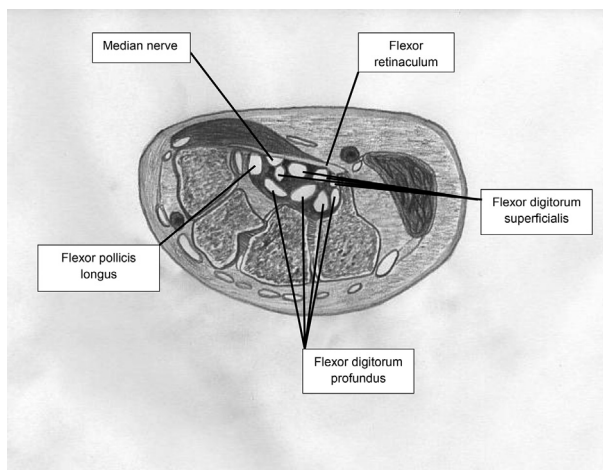


Fig. 1. Anatomical diagram of the carpal tunnel in transverse section.

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