

Morphologic and functional evaluation of the carpal tunnel syndrome before and after treatment

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Background. The carpal tunnel is defined as the space deep to the transverse carpal ligament. The transverse carpal ligament extends medially from the hook of hamate and the triquetrum to the scaphoid and the trapezium laterally. The carpal tunnel is bordered posteriorly by the carpal bones. Within this narrow space, is not only the median nerve, but also nine flexor tendons. Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy. It's related to compression of the median nerve (MN), which results in pain, numbness, and tingling. Among the potential factors that may contribute to the onset of CTS, repetitive maneuvers, trauma, pregnancy, sex and age seem to be the most frequent causes. It is more common in females with an average ratio F: M 3,8:1 and the most represented age of onset is between 50 and 59 yrs. Diagnostic tests are based on physical examination, electrodiagnostic tests (EDTs) (nerve conduction studies and electromyography) and imaging techniques such as ultrasound (US). The use of US provide additional valuable anatomical information to that obtained from clinical tests and EDTs.

Aim. The purpose of this study was to perform a morphological analysis of the carpal tunnel using US and to correlate the data obtained with clinical and functional evidences. Furthermore, another aim was to assess the morphologic changes, by imaging techniques, after beginning treatment.

Materials and methods. Patients with clinical and EDTs evidence of CTS were enrolled. Patients with a history of other conditions associated with neuropathy (such as diabetes mellitus, hypothyroidism, chronic renal failure, etc.) were not included. Before starting treatment, every patient was administered a questionnaire for pain, visual analogue scale (VAS). Ultrasound was performed to evaluate all morphological features of carpal tunnel syndrome: cross-sectional area, hypervascularity and hypo-echoic of median nerve, flexor muscles and tendons.

Results and conclusion. Our results show changes in cross sectional area of median nerve, in sensory latency and in the VAS score before and after starting treatment.

Ultrasonography is useful in the evaluation of soft tissues of the carpal tunnel and the median nerve; this technique has increased in its sensitivity and specificity: an increasing number of studies have supported early suggestions that measurement of the cross-sectional area and morphology of the median nerve with high-resolution sonography compares favorably with physical examination alone; thus, this technique is proving to be a useful tool for diagnosis.

Keywords: Carpal tunnel, syndrome, morphology, ultrasound, electroneurography