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The use of Electrodiagnostic studies and musculoskeletal sonography in carpal tunnel syndrome

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The use of Electrodiagnostic studies and musculoskeletal sonography in carpal tunnel syndrome

Carpal tunnel syndrome is the number one reason for referral to Electrodiagnostic practices and can be considered as the most common peripheral focal mononeuropathy.[1, 2] Carpal tunnel syndrome is simply an injury to the median nerve at the wrist where the nerve can face a potential entrapment in the tunnel that is formed by the carpal bones.

Differential diagnosis of carpal tunnel syndrome from C6-C7 radiculopathy and, less often, brachial plexus injuries may be challenging particularly in very mild or early cases.[1] According to CPG on CTS adopted by American Academy of Orthopaedic Surgeons (AAOS), there is no one gold standard test to diagnose CTS.[3] Using nerve conduction studies (NCS), electromyography (EMG) and neuro-ultrasound will offer the best combination of tests that help in diagnosing and classifying the severity of the condition.

Para-nodal demyelination of the median nerve at the wrist is the early underlying pathology in CTS.[2] Focal slowing across the wrist and increased distal latencies of sensory and motor portions are common.[2] Reduced amplitude of the median sensory nerve action potential (SNAP) at the wrist compared to the palm can be the only early sign in CTS cases implying a possible conduction block and myelin sheath compromise.[4] Assessing the electrical stability of the membrane of Abductor pollicis brevis muscle using needle EMG helps to identify moderate to severe cases where possible axonal loss of the median nerve may occur.(Figure1) Quantifying the percentage of possible axonal loss may be obtained by comparing the compound muscle action potential (CMAP) of the affected nerve to the unaffected opposite nerve.

A reasonable scheme, out of many, to be considered when it comes to classifying the severity of the syndrome is GEHS neurophysiological system.[5] Prolonged sensory latencies, present sensory response, and normal motor latencies are considered a mild injury.[4, 5] Add to the previous prolonged motor latencies will be considered as a moderate injury.[4, 5] Reduced motor amplitudes and/or signs of axonal loss and denervation on EMG can be considered as a severe injury.[4, 5]