TITLE: Prolonged Compression Relief (PCR) Test as a Marker of Severe Carpal Tunnel Syndrome

AUTHORS AND CO-AUTHORS: Madeline Labor, BS Andre Ivy, MD

INSTITUTIONS: Duly Health Center, Chicago, IL, University of Colorado School of Medicine, Aurora, CO

Disclosures: The authors have no disclosures.

INTRODUCTION: Traditional provocative maneuvers for carpal tunnel syndrome (CTS), such as Durkan's compression test, elicit paresthesias. In contrast, we observed that during sustained compression, some patients instead experienced relief of symptoms. This paradoxical relief may reflect a physiologic transition from continuous paresthesias at rest to complete sensory block (frank numbness) which patients perceive as more comfortable. We termed this the Compression Relief Test (CRT) and hypothesized that CRT positivity corresponds to severe CTS on electrodiagnostic testing.

METHODS: Nineteen adults with suspected CTS presented to a single hand surgery outpatient office. Each patient underwent a standard CT-6 clinical examination confirming the diagnosis of CTS. During the standard carpal tunnel clinical evaluation by a single surgeon, patients were asked: "Does this make your fingers feel better or worse?" A response of "better" defined a CRT-positive result. This was then followed by routine nerve conduction studies (NCS) and electromyography (EMG) to grade severity and exclude central pathology. Electrodiagnosticians were blinded to CRT status. Severe CTS was defined by absent sensory responses, absent or reduced motor amplitudes (<1 mV), markedly prolonged distal latency, or EMG impressions explicitly stating, "severe or worse."

RESULTS: The cohort included 19 patients (4 male, 15 female patients) with a mean age of 67.3 years. All nineteen CRT-positive patients demonstrated electrodiagnostic findings consistent with severe or worse CTS. Female patients comprised 79% of the cohort and demonstrated lower median motor amplitudes compared with males (2.4 ± 2.1 mV vs 7.4 ± 0.2 mV, $p < 0.01$), consistent with greater electrophysiologic severity. Latency differences between sexes were not statistically significant. One EMG report described "moderate" disease; however, the findings (absent sensory response, prolonged motor latency, and reduced abductor pollicis brevis recruitment) met criteria for severe CTS. Thus, 100% of CRT-positive patients demonstrated severe CTS by physiologic standards, with the test's electrodiagnostic positive predictive value and sensitivity both 100%. Average electrodiagnostic values confirmed advanced disease: mean sensory latency 5.75 ± 1.09 ms, sensory amplitude 10.12 ± 4.81 μV, motor latency 7.59 ± 2.72 ms, and motor amplitude 3.36 ± 2.66 mV.

CONCLUSIONS: The CRT test strongly correlates with severe CTS on electrodiagnostic studies. Relief of symptoms with prolonged compression may represent a simple bedside marker of advanced disease.

SIGNIFICANCE: Identifying a low-cost, bedside test that predicts severe CTS could improve triage and expedite electrodiagnostic confirmation or surgical referral for advanced disease.