

## Assessing Gender Disparities in Indication for Carpal Tunnel Surgery

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**INTRODUCTION:** Carpal tunnel syndrome (CTS) is the most common nerve entrapment neuropathy and can be treated with either nonsurgical interventions, such as a brace or injection, or surgical intervention with carpal tunnel release (CTR). While the effect of gender differences on physician recommendations as well as patient satisfaction following surgery have been explored in other orthopaedic diagnoses, these impacts have been less elucidated in CTS. This study aims to determine if there is an association between patient gender and treatment recommendation for patients with CTS.

### **METHODS:**

Patients diagnosed with CTS were identified and their records retrospectively reviewed from 2/1/2016 to 10/4/2020. Diagnosis of CTS was made by a fellowship-trained hand surgeon and confirmed with electrodiagnostic studies in all patients included in the study.

Patient age, gender, and electrodiagnostic disease severity were recorded for each patient. Patient self-identified race/ethnicity was stratified into 4 categories: White non-Hispanic/Latino, Hispanic/Latino, Black non-Hispanic/Latino, and Other. Outcomes measures included treatment recommendation (surgical vs. nonsurgical), treatment completed, and time interval between initial surgical recommendation and surgery. Differences in outcome measures were analyzed using Pearson's chi-squared test and two-sample t-test. P-values less than 0.05 indicate statistical significance.

### **RESULTS:**

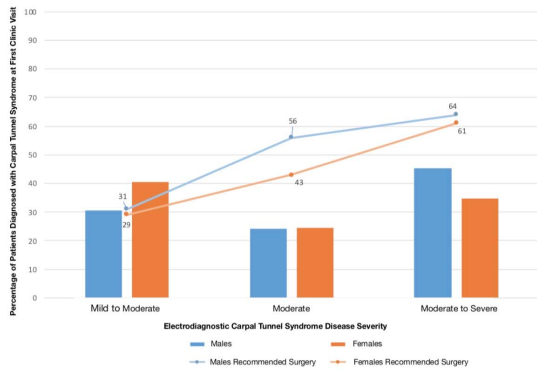
A total of 949 patients meeting the inclusion criteria are presented with a mean age of 54 years (range 18-80). Patient race/ethnicity consisted of 71% White non-Hispanic (n=674), 11.1% Hispanic (n=106), 9.9% Black non-Hispanic (n=94), and 7.9% identifying as Other (n=75). In the entire cohort, electrodiagnostic severity at first clinic visit was mild to moderate in 36.7% (n=348), moderate in 24.3% (n=231), and moderate to severe in 39.0% (n=370). When stratified by EMG-severity, 40.6% (n=233) of females presented with mild to moderate CTS, 24.6% (n=141) with moderate CTS, and 34.8% (n=200) with moderate to severe CTS. Male EMG-severity was 30.7% (n=115) mild to moderate, 24% (n=90) moderate, and 45.3% (n=170) moderate to severe. A significantly greater proportion of males presented with moderate to severe EMG severity as compared to females (p=0.002) (Figure 1).

In the entire cohort, 47% (n=444) of patients were offered surgical intervention. Males were offered surgical intervention more frequently than females (50.9% vs. 44.1%, respectively, p=0.039). When stratified by EMG-severity, females with moderate CTS were 23% less likely to be offered surgery than males (43% and 56%, respectively) which did not reach statistical significance (p=0.072). When stratifying further by race/ethnicity, Hispanic and Black females were 4 times less likely to be offered surgery than their male counterparts; this also did not reach statistical significance (p=0.14 and p=0.06, respectively) (Figure 2).

Of 444 patients offered surgical intervention, 72% (n=318) ultimately underwent surgery. This was not different between males and females (71% vs. 72%) (p=0.57). There was no significant association between gender and decision to pursue or timing to surgical intervention (p=0.68 and p=0.89, respectively).

**DISCUSSION AND CONCLUSION:** In the entire cohort, as expected, males were more likely to present with more severe CTS and to be offered surgery than females. When stratifying by patients with similar EMG-severity, males with moderate CTS were nearly 25% more likely to be recommended surgical intervention than females. This difference was more profound when further stratifying males and females by race/ethnicity, with Hispanic and Black females being 4 times less likely to be offered surgery for moderate CTS than their male counterparts. Of note, these findings were not statistically significant likely due to limitations in sample size. Future investigations involving more patients should aim to further stratify patients by race/ethnicity and explore gender differences in indication for CTR.

**Figure 1. Electrodiagnostic Disease Severity Stratified by Patient Gender**



**Figure 2. Surgical Recommendation for Moderate Electrodiagnostic Severity Stratified by Gender and Self-Identified Race/Ethnicity**

