Revision Rates and Outcomes of Endoscopic versus Open Carpal Tunnel Release

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INTRODUCTION: The purpose of our study is to compare the one-year revision surgery rates and outcomes of open versus endoscopic carpal tunnel release. Our hypothesis is that the revision rate for endoscopic surgery will be higher than open release, and revision surgery in general will be correlated with PROMIS upper extremity (UE), pain interference (PI), and physical function (PF) scores.

METHODS: This is a 5-year retrospective study of 4,338 consecutive patients undergoing isolated endoscopic or open carpal tunnel release at an exclusively hand-fellowship-trained, large academic institution. Demographic information, treatment method, PROMIS UE, PF, PI, and patient acceptable symptom state (PASS) were recorded for each patient at the pre-op, 2 week, 6 week, 12 week, 6 month, and 12 month visits. Statistical analysis was completed using unpaired T-test, Chi-square analysis, and multivariable regression.

RESULTS:

Among the 4,338 patients undergoing isolated carpal tunnel release, 1,058 underwent endoscopic release (24.4%) and 3,280 underwent open release (75.6%). Of the open release cohort, 23 (0.71%) required revision carpal tunnel release within one year. Of the endoscopic release cohort, 22 (2.08%) required revision carpal tunnel release within one year. The odds ratio for patients requiring revision carpal tunnel release after initial endoscopic procedure compared to open procedure was 3.01 (95% CI 1.67-5.42, p=0.0002). The overall one-year revision surgery rate was 1.04%. The average time to revision surgery was 241 days (SD 37 days). Multivariable logistic regression analysis further revealed that smoking, rheumatoid arthritis, male gender, diabetes mellitus, and presence of cervical disease were also independently associated with higher odds for revision surgery. PASS and PROMIS UE, PI, and PF were correlated with increased revision surgery rates, however PROMIS depression was not.

DISCUSSION AND CONCLUSION: At a large, exclusively hand-fellowship-trained institution, there was an overall 1.04% one-year revision surgery rate after carpal tunnel release. Endoscopic surgery, smoking, rheumatoid arthritis, male gender, diabetes mellitus, and presence of cervical disease were independently associated with increased odds for requiring revision surgery. Future work will focus on multivariable conditional logistic regression of the matched case-control cohort as well as analyzing preoperative treatment modalities as potential predictors of revision surgery.