Endoscopic Release for Severe Carpal Tunnel Syndrome in Octogenarians

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Purpose To investigate the clinical outcomes of endoscopic carpal tunnel release for severe carpal tunnel syndrome in octogenarians compared with a younger cohort.

Methods Fifty-five hands in 48 patients were enrolled in this study. There were 27 hands in 24 octogenarians and 28 hands in 24 patients in a younger group with average ages of 83 and 60 years, respectively. Postoperative follow-ups were 8.5 and 7.2 months, respectively. Clinical evaluation included documentation of subjective symptoms and Semmes-Weinstein testing before surgery, 3 months after surgery, and at final follow-up. Symptom severity and function outcomes scores and compound muscle action potential of abductor pollicis brevis as an electrophysiological assessment were evaluated before surgery and at the final follow-up.

Results Nocturnal pain and paresthesias were improved in all patients. The octogenarians had poorer recovery of Semmes-Weinstein testing score and better improvement of outcomes scores than the younger group. There was no difference of the results in postoperative electrophysiological improvement between the groups.

Conclusions Endoscopic release for severe carpal tunnel syndrome relieved symptoms and improved activities of daily living in octogenarians. *(J Hand Surg Am. 2014;39(12):2448–2453.*

Type of study/level of evidence Therapeutic III.

Key words Carpal tunnel syndrome, endoscopic carpal tunnel release, octogenarian.

CARPAL TUNNEL SYNDROME (CTS) is the most common compression neuropathy of the upper extremity. Although efficacy of carpal tunnel release has been studied and well established in the general population, its efficacy in elderly patients remains uncertain. Authors have suggested that even though the improvement following carpal tunnel release is not as great as with a younger population, carpal tunnel release still offers meaningful benefit in elderly patients with CTS.[1–7] However, these studies did not compare their outcomes with other age groups.[1–7] Contrary to these reports, several authors compared clinical outcome after carpal tunnel release between younger and older patients and demonstrated less favorable outcome in elderly patients.[8–11] However, in these studies, preoperative neurophysiological status and clinical symptoms of CTS were not uniform between the groups.[8–11] Thus, these studies did not provide a direct comparison of clinical outcome after carpal tunnel release between younger and elderly patients.

The purpose of this study was to investigate and compare the clinical outcomes of endoscopic carpal tunnel release (ECTR) for electrophysiologically diagnosed severe CTS in octogenarians with those of a younger cohort. We hypothesized that octogenarians having ECTR for severe CTS would have symptom relief and improved activities of daily living.

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MATERIALS AND METHODS

Patients

This study was undertaken in conformity with the Declaration of Helsinki after approval of our institutional review board. Written informed consent was obtained from each patient. CTS was diagnosed with physical examination and electrophysiological assessment.

We performed a retrospective comparative study of outcomes following an ECTR for severe CTS between octogenarians (octogenarian group) and patients age 55 to 64 years (younger group). The primary inclusion criteria were patients with severe CTS as measured by electrophysiological study who then underwent an ECTR. Compound muscle action potential (CMAP) from the abductor pollicis brevis (APB) was investigated in all patients before surgery. The APB-CMAP was recorded with surface electrodes by supramaximal stimulation of the median nerve at the wrist.[12] Distal latency was measured from the stimulus artifact to the onset of the potential. Amplitude was measured from the baseline to the negative peak of the potential. Severe CTS was categorized as an undetectable or prolonged distal motor latency of APB-CMAP (> 7.0 ms) according to the classification of Choi and Ahn.[13] The minimum postoperative follow-up period was 6 months. Exclusion criteria included cognitive difficulties that precluded the ability to complete a self-administered questionnaire, insulin-dependent diabetes, thyroid disease, rheumatoid arthritis, symptomatic cervical radiculopathy, previous carpal tunnel release, cubital tunnel syndrome, symptomatic thumb basal joint arthritis, previous wrist fracture, and previous surgery on the hand.

We surgically treated 679 consecutive hands with idiopathic CTS between 2007 and 2013. Among them, 48 patients (55 hands) met these criteria and were enrolled in this study. There were 27 hands in 24 patients in the octogenarian group and 28 hands in 24 patients in younger group. Patient demography is summarized in Table 1.

In all hands, an ECTR with 2-portal technique was performed under local anesthesia with a pneumatic tourniquet.[14] A sterile bulky dressing without orthosis was applied after surgery. The following day, the patients started gentle finger and wrist motion exercises. Two weeks after surgery, more vigorous exercises were initiated and scar massage was added.

TABLE 1. Patients' Demographic Data

	Octogenarian	Younger
Patients (n, hands)	24 (27%)	24 (28%)
Age at time of surgery (y)	83 ± 3	60 ± 4
Sex distribution	Male, 3; female, 21	Male, 5; female, 19
Dominant hand (n)	18	20
Follow-up periods (mo)	8.5 ± 2.9	6.2 ± 2.3
Hands with diminished pinch function (n)	16	12

Assessment

Clinical evaluation was performed before surgery, 3 months after surgery, and at final follow-up. During each evaluation, the following parameters were assessed. All patients were reviewed directly by a certified hand therapist in our hospital who had not been primarily involved in the patients' management. We asked patients about nocturnal pain and paresthesias in the median nerve distribution. Sensory thresholds in the middle finger pulp were determined using Semmes-Weinstein monofilaments measuring 0.08, 0.22, 2.4, and 279 g. The lowest filament force detected reliably was recorded.

Patient-reported outcome was measured using the Japanese Society for Surgery of the Hand version of Carpal Tunnel Syndrome Instrument (CTSI)[15] before surgery, and at the final follow-up. As one of the disease-specific measures, a self-administered questionnaire for the assessment of severity of symptoms and functional status in CTS, originally described by Levin et al,[16] has had several names, for example, CTSI[15,17] and the Boston Carpal Tunnel Syndrome Questionnaire.[8] CTSI contains a symptom severity subscale and a functional subscale. Symptom severity score is calculated as the mean of the scores for 11 individual items, and function score is calculated as the mean of the scores for 8 items. The questions have multiple-choice responses, scored from 1 point (no symptom) to 5 points (most severe symptom).

As an electrophysiological assessment, APB-CMAP was evaluated at the final follow-up.

The responsiveness of instruments including CTSI and amplitude of APB-CMAP was examined by the standardized response mean and effect size. Standardized response mean was calculated as the mean difference between the preoperative and the follow-up scores divided by the SD of this difference. Effect size was calculated as the mean difference between the preoperative and the follow-up scores divided by the SD of the preoperative scores.

The higher these parameters, the greater the responsiveness. The values greater than 0.8 indicated