Improved surgical outcomes with endoscopic carpal tunnel release in patients with severe median neuropathy

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Background

• Carpal Tunnel Syndrome (CTS) affects 6% of the US adult population; up to 20% of CTS is severe.¹
• Surgery can be done via an open (OCTR) or endoscopic (ECTR) technique.
• Long term outcomes are equivalent between the two techniques; however, OCTR is more commonly used.²
• The effectiveness of ECTR vs. OCTR is unknown in patients with severe CTS.

Hypotheses

1. Patients with severe CTS who undergo ECTR will report positive symptomatic improvement outcomes.
2. Patients with severe CTS who undergo OCTR will report equal or better symptomatic improvement outcomes than patients with severe CTS who undergo OCTR.

Methods

• Retrospective cohort study
• Preoperative physical examination
• Preoperative electromyographic abnormalities
• Clinical and electrical diagnosis of CTS
• Operation done by a single surgeon 2001 – 2014
• Operation technique: ECTR or OCTR

• Severe CTS criteria
• Complete block of median sensory nerve response
• Median nerve motor response amplitude < 4mV with latency > 6.45ms
• Presence of thenar atrophy
• Positive physical examination (Tinel’s test at wrist, Phalen’s test)

• Primary outcome
• Patient reported degree of symptomatic resolution of pre-operative CTS symptoms at any point in follow-up

• Secondary outcomes
• Complication rates, reoperation rate, relapse rate

Limitations

• Non-randomized patients
• Retrospective data collection
• Subjective outcome variable

Table 1 – Pre-operative characteristics of 138 cases of severe CTS

Table 2 – Post-operative secondary outcomes of 138 cases of severe CTS

Results

Table 1 – Pre-operative characteristics of 138 cases of severe CTS

Characteristic | ECTR (N = 39 cases) | OCTR (N = 99 cases) | p Value
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Preoperative steroids | 3 | 8 | 4 | 4 | 0.20
Positive physical examination | 21 | 54 | 43 | 41 | 0.11
Presence of thenar atrophy | 31 | 79 | 73 | 73 | 0.28
Electromyographic abnormalities* | 19 | 49 | 67 | 68 | 0.07

Table 2 – Post-operative secondary outcomes of 138 cases of severe CTS

Outcome | ECTR (N = 39 cases) | OCTR (N = 99 cases) | p Value
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Postoperative pain in web space | 0 | 0 | 1 | 1 | 0.81
Conversion from ECTR to OCTR | 0 | 0 | NA | NA
Infection | 0 | 0 | 1 | 1 | 0.81
All-cause complication | 0 | 0 | 2 | 2 | 0.29
Recurrence | 1 | 2.6 | 10 | 10.1 | 0.003
Time to recurrence (mo.) | 11.2 | 17.3 (10.0–91.4)* | <0.001
Reoperation | 0 | 0 | 4 | 4 | 0.015
Follow-up (mo.) | 16.6 (1.0–131)* | 9.0 (1.0–143)* | 0.14

Conclusions

• ECTR is at least as effective as OCTR in relieving pre-operative CTS symptoms in patients with severe CTS.
• Patients with severe CTS can be safely treated with ECTR as there is no added risk of complications, reoperations, or recurrence.
• Clinicians and patients may be able to more confidently consider ECTR as treatment for severe CTS.