

# 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.<sup>1</sup>
- 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.<sup>2</sup>
- 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 ECTR will report equal or better symptomatic improvement outcomes than patients with severe CTS who undergo OCTR.

## Methods

- Retrospective cohort study
  - Severe CTS treated with ECTR or OCTR
- Inclusion criteria
  - Operation done by a single surgeon 2001 – 2014
  - Clinical and electrical diagnosis of CTS
- Severe CTS criteria
  - Complete block of median sensory nerve response
  - Median nerve motor response amplitude < 4mV with latency > 6.45ms
- 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

## Results

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

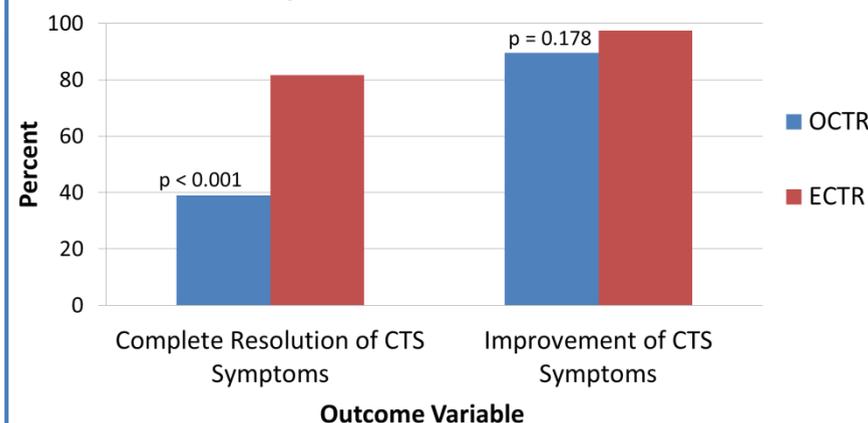
Characteristic	ECTR (N = 39 cases)		OCTR (N = 99 cases)		p Value
	No.	%	No.	%	
	Preoperative steroids	3	8	4	
Positive physical examination (Tinel's test at wrist, Phalen's test)	21	54	41	41	0.11
Presence of thenar atrophy	31	79	73	73	0.28
Electromyographic abnormalities*	19	49	67	68	0.07

CTS carpal tunnel syndrome, ECTR endoscopic carpal tunnel release, OCTR open carpal tunnel release.  
\*Fibrillations, positive sharp waves, or fasciculations.

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

Outcome	ECTR (N = 39 cases)		OCTR (N = 99 cases)		p Value
	No.	%	No.	%	
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

**Figure 1 Patient Reported Outcomes of Severe CTS**



## 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.

<sup>1</sup> Becker J, et al.. Is carpal tunnel syndrome a slow, chronic, progressive nerve entrapment?. Clin Neurophysiol. 2014;125(3):642-6

<sup>2</sup> Ferdinand R et al. Endoscopic versus open carpal tunnel release in bilateral carpal tunnel syndrome. A prospective, randomised, blinded assessment. J Bone Joint Surg Br. 2002;84(3):375-9.