

# End-To-Side Nerve Transfer for Compressive Ulnar Neuropathy: A Systematic Review

Victoria Comunale, Nadia Linton, Michele Nicole Cerasani, Danielle Heather Markus, Janos Barrera, Omri Ayalon, Jacques Henri Hacquebord

**INTRODUCTION:** In-situ decompression (ISD) is the most commonly performed treatment for cubital tunnel syndrome (CuTS) due to its efficacy and low morbidity. However, anterior interosseous nerve (AIN) to ulnar motor nerve transfer using end-to-side (ETS) has emerged as an adjunct procedure to improve reinnervation of intrinsic muscles. This study aims to systematically review the literature on ETS and ISD for severe CuTS.

**METHODS:** A search of PubMed, OVID, Web of Science, and Scopus was conducted from inception to February 2024. Inclusion criteria were patients with severe ulnar nerve compression, and included studies were required to report on follow-up quantitative data, such as electrodiagnostic outcomes, range of motion measurements, or qualitative or functional outcomes.

**RESULTS:** Initially, 2006 studies were identified and 10 studies investigating ISD or ETS for treatment of severe cubital tunnel syndrome were included. The most consistent finding across studies was the improvement in key pinch strength in the ETS cohort. Weighted average across studies showed a 45.58% improvement in key pinch strength for the ETS group, compared to 26.20% in the ISD cohort. The weighted average of grip strength revealed a more modest improvement in the ETS group (29.99%) versus the ISD group (22.95%). The average improvement in DASH scores was 65.02% for the ETS group versus 61.88% for the ISD group.

**DISCUSSION AND CONCLUSION:** ETS may offer superior improvements in intrinsic hand function outcomes to ISD, while ETS offers similar results to ISD in sensory and patient-reported measurements. ETS may be a valuable adjunct in the management of severe cubital tunnel syndrome, particularly for patients with limitations secondary to weakness in pinch or grip strength.

Table 1: Calculated Percent Improvement of Reported Outcomes

Author	Intervention	Average Follow Up (months)	Post-op Key Pinch Measurement	Post-op Grip Strength	Post-op Monofilament Test	Post-op Two Point Discrimination	Post-op DASH Scores	Post-op MHQ
Song <sup>23</sup>	ISD	12	9.84%	35.90%	36.36%	58.33%	44.58%	58.19%
Curran <sup>24</sup>	STE	24	86.24%	-	2.74%	-	-	-
Curran <sup>24</sup>	ISD	24	25.49%	-	3.56%	-	-	-
Xie <sup>25</sup>	ETS	24	40.16%	45.59%	-	42.68%	78.71%	110.81%
Knigh <sup>26</sup>	ETS	22.8	38.46%	30.65%	-	14%	0%	-
Karthik <sup>28</sup>	ISD	12	31.06%	19.50%	-	-	-	-
Dengler <sup>29</sup>	ETS	11.2	28.70%	13.13%	-	-	64.29%	-
Yeoman <sup>31</sup>	ISD	17	-	-	-	-	72.30%	-

Table 2: Average Weighted Percent Improvement of Reported Outcomes Between Studies

Intervention	Post-op Key Pinch Measurement	Post-op Grip Strength	Post-op Monofilament Test	Post-op Two Point Discrimination	Post-op DASH Scores
ETS	45.58%	29.99%	-	37.90%	65.02%
ISD	26.20%	22.95%	12.61%	-	61.88%