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## AIN to Ulnar Motor Nerve Transfer Meta Analysis

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## **Abstract**

**Background:** There are currently few comprehensive studies of end-to-end and “supercharged” reverse end-to-side (SETS) anterior interosseous nerve (AIN) to ulnar nerve transfers for treatment of ulnar neuropathy. The authors performed a literature review existing published literature to evaluate the indications for, and utility of, AIN-ulnar nerve transfer as a treatment method and to inform future treatment decisions.

**Methods:** A literature review was performed based on the following inclusion criteria: inclusion of anterior interosseous nerve or AIN, ulnar nerve or ulnar motor nerve, transfer or nerve transfer, and outcome, motor, clinical, ulnar neuropathies, ulnar nerve paralysis, treatment or function. Exclusion criteria included animal studies or studies not in English. Results were analyzed based on the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire scores, grip and key pinch strength, and interosseous Medical Research Council (MRC) graded strength. Preoperative and postoperative differences were evaluated by independent t-test and Mann-Whitney U-test.

**Results:** Literature search identified 103 unique articles. Following screening, 13 full-text articles were reviewed. 9 articles met the inclusion criteria, of which 5 pertained to the reverse end-to-side (SETS) technique and 4 pertained to the end-to-end technique. 130 patients (mean age, 40.8 +/- 12.8 years) were included overall, and 114 patients had sufficient follow-up to evaluate functional outcomes. The mean time to surgery was 5.4 +/- 2.2 months and the mean follow-up period was 18.2 +/- 27.0 months. Injuries to the ulnar nerve and diagnoses varied, but all patients had preoperative clinical evidence of ulnar weakness, and the majority of patients (70%) had documented preoperative decreased grip or key pinch strength and/or motor MRC grade. Other indices included weak index crossover, interosseous atrophy, and denervation evidenced by electromyography of the first dorsal interosseous (FDI) muscle. Motor MRC grade, DASH score, and grip and key pinch strength all improved significantly from their preoperative baseline.

**Conclusion:** Both end-to-end and SETS nerve transfer produced significant improvement in motor function. Nerve transfer is an effective treatment method of both transection and compression injuries, with outcomes comparable to or better than traditional nerve grafts.