

Simple Decompression Versus Anterior Transposition of the Ulnar Nerve for Distal Humerus Fractures Treated With Plate Fixation: Secondary Outcomes of a Randomized Trial

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Purpose: Following surgical treatment of distal humerus fractures, ulnar nerve symptoms are common. We previously presented primary outcome results from our prospective randomized trial comparing ulnar nerve simple decompression (SD) to anterior transposition (AT) after bicolunar plate fixation of acute distal humerus fractures without demonstrating any significant differences between treatment groups. We present here the secondary ulnar nerve outcome results for that study.

Methods: Patients aged 16 to 80 years of age with a displaced, distal humerus fracture (OTA 13A or 13C), and ≤ 28 days post-injury with a closed or grade I/II open fracture were recruited into the study. Participants were randomized to receive either SD or AT of the ulnar nerve, with a similar postoperative protocol. Ulnar nerve outcomes included: Jamar grip and pinch strength, Semmes-Weinstein monofilament test, Jebsen test of hand function, and return to work and activities. Patients were followed until 2 years postoperatively.

Results: 61 patients enrolled in the study, 27 of whom were randomized to AT, 31 to SD, and 3 withdrew preoperatively. The mean age was 52.7 years with 60% females. There were no significant differences in the monofilament test, grip strength, lateral pinch, palmar pinch, tip pinch, Jebsen hand test, or return to work and activities between the 2 groups after 3 months. All outcomes significantly improved over time. Relative to the unaffected side, Jebsen hand test, lateral pinch, palmar pinch, tip pinch, and grip strength scores of the affected side were worse (range, 2.2%-83.3%). Multivariable analysis identified independent predictors of our secondary outcomes, in which triceps-sparing approach ($P = 0.0146$) and triceps split approach ($P = 0.0233$) were both associated with decrease in tip pinch score, while plate placement was not. Both approaches were also associated with a decrease in grip strength (triceps sparing, $P = 0.04$; triceps split, $P = 0.0013$) and higher Jebsen hand test scores (triceps sparing, $P = 0.003$; triceps split, $P = 0.007$).

Conclusion: Consistent with our previously presented results, SD and AT were shown to be equally effective methods with both treatments showing significant improvement but residual ulnar nerve impairment in all outcomes over time. Our study suggests that triceps-sparing and triceps split approaches decrease lateral pinch and grip strength scores, while increasing Jebsen hand test scores, which may impact patient functional outcomes postoperatively.

OTA Grant