

Impact of Hand Dominance on Functional Recovery Following Upper Extremity Injuries

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Purpose: Hand dominance is commonly elicited from patients with upper extremity injuries; however, its influence on outcome is unclear. Few studies investigating the relationship have reported mixed results. Furthermore, the impact of hand dominance on outcome appears to be modulated by factors such as age, sex, and operative versus nonoperative management. This study sought to determine the influence of hand dominance on patient recovery following operative and nonoperative management of upper extremity injuries.

Methods: This was a retrospective subgroup analysis of 4 multicenter prospective randomized controlled trials (RCTs) of upper extremity trauma: Humeral Diaphyseal RCT, PERK-1 (elbow fractures and dislocations), Ulnar Diaphyseal RCT, and distal radius RCT. Patient and injury characteristics including age, sex, injury classification, and management (operative versus nonoperative) were collected. Clinical and patient-reported outcomes, including the Disabilities of the Arm, Shoulder and Hand (DASH) were collected. A multiple variable regression analysis determined variables that predicted patient-reported outcome scores with the variable of interest being dominant hand injured (yes/no).

Results: Across the 4 trials, 582 patients met inclusion criteria, with 73%, 61%, 51%, and 26% of males in the Ulnar Diaphyseal, Humeral Diaphyseal, PERK-1, and Distal Radius studies, respectively. The dominant upper extremity was injured in 56%, 50%, 46%, and 55% of patients in the trials, respectively. At 2-week follow-up, the DASH scores were significantly higher (worse) if the dominant extremity was injured (53 ± 21 versus 59 ± 21 ; $P = 0.02$). However, at subsequent follow-ups out to 12 months post-injury, there were no differences in DASH scores between the side of the extremity injury. Based on regression analysis, injury of the dominant upper extremity was a significant predictor of higher DASH scores at 2 weeks post-injury, with an 8.5-point further impairment (confidence interval = 1.0-15.9; $P = 0.026$), if the dominant upper extremity was injured. Analysis of additional patient-reported outcome measures and functional outcomes is underway.

Conclusion: This study identified significantly worse early impairment if the dominant arm was injured, which may be clinically significant, given a minimal clinically important difference for the DASH score of 10 points and the observed 8.5-point impairment using the DASH. This early greater dysfunction did not persist in subsequent follow-up assessments. This finding will help inform post-injury patient counseling regarding expectations for functional recovery after upper extremity injuries.