

Diminished Elbow Range of Motion Does Not Affect Functional Outcomes in Operatively Treated Supracondylar Humerus Fractures: A Prospective Study

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Background/Purpose: Although elbow stiffness is a commonly reported complication following the operative treatment of pediatric supracondylar humerus fractures, the relationship between ultimate range of motion and functional outcomes has never been studied prospectively in this patient population. The purpose of this study is to prospectively evaluate the relationship between elbow range of motion (ROM) and functional outcomes in children with supracondylar humerus fractures (SCHFX) using validated outcomes measures.

Methods: An IRB-approved prospective enrollment of consecutive patients with operative SCHFX was performed over a 3-year period. Elbow ROM and carrying angles for operative and nonoperative extremities were documented at final follow-up, and functional outcome was assessed using the Pediatric Outcomes Data Collection Instrument (PODCI) and the QuickDASH (an abbreviated version of the Disabilities of the Arm, Shoulder and Hand [DASH]) outcome measure. Patients were stratified by arc of motion differences between the operative and nonoperative elbow. Paired Student's *t* test and ANOVA (analysis of variance) were used to compare arc of motion to functional outcome scores.

Results: 752 patients were enrolled during the study period. 62 (average age 5.4 years) completed functional outcome measures and had complete ROM data at final follow-up (average 13 weeks; range, 10-31 weeks). Average flexion-extension arc was 136° in the operative extremity (-1.4° extension, 135° flexion) versus 146° in the nonoperative side (-4.3° extension, 142° flexion), which was significantly different ($P < 0.0001$). There were no differences at final follow-up between the operative and nonoperative extremities in average pronation-supination arc (162° vs 163°) or average carrying angle (5.3° vs 5.5°). There were no statistically significant differences in PODCI or QuickDASH scores between those achieving <90% flexion/extension arc of the nonoperative side when compared to those with ≥90%, nor for those operative elbows with >1 standard deviation difference from the nonoperative side in flexion/extension arc versus those within 1 standard deviation. Due to the lack of statistically significant differences in outcome measures between these groups, controlling for other injury parameters such as patient age, fracture classification, neurologic injury, and vascular abnormality was not necessary.

Conclusion: While operatively treated SCHFX may result in an average 10° decrease in flexion/extension arc of motion, this did not affect functional outcomes in this cohort.