

Determinants of Functional Outcome in Distal Radius Fractures in High Functioning Elderly Patients

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Background/Purpose: Despite numerous previous studies showing no difference between operative and nonoperative treatment of distal radius fractures in the elderly, the rate of operative fixation has increased fivefold over the last decade. We aimed to determine the influence of treatment and radiographic parameters on patient-reported functional outcomes over a 1-year period.

Methods: Patients with an acute distal radius fracture over the age of 55, and with a Canadian Study of Health and Aging (CSHA) Frailty score of 1 or 2 (high functioning, medically well) were recruited for this prospective study and treated as per the surgeon's protocol. Baseline patient characteristics were collected. Standard radiographs were obtained at the time of injury, treatment, and at 12-week follow-up. Patients provided baseline, as well as 12-week and 1-year functional outcome measures including the Patient-Rated Wrist Evaluation (PRWE), Disabilities of the Arm, Shoulder and Hand (DASH), and Short Form-36 (SF-36). Univariate analyses to evaluate the relationship between operative and nonoperative treatment, as well as various radiographic parameters, on functional outcome were performed. Linear regression analysis was carried out to determine the effect of specific radiographic parameters as well as surgical treatment on functional outcome when controlling for other important predictors.

Results: 129 patients were recruited for this study, 117 women and 12 men. The mean age of the cohort was 65.96 ± 0.67 years (range, 55-90). 70 patients underwent open reduction and internal fixation, and 59 were treated with manipulation and casting. There was no statistically significant difference in DASH score, SF-36 PCS (physical component summary) or PRWE at 52 weeks follow-up ($P = 0.963$, $P = 0.184$, $P = 0.645$). The operative group had higher PRWE pain scores (7.85 ± 1.08 vs. 6.95 ± 1.34) but this did not reach statistical significance. As expected, the operative group had a significantly worse composite radiographic score at the time of injury ($P = 0.0002$), but the two groups had very similar scores at the time of treatment ($P = 0.4303$). At 3 months postsurgery, the nonoperatively treated group had significantly worse radiographic scores ($P = 0.0006$). A univariate relationship existed between ulnar positive measurement of >2 mm and poorer DASH and SF-36 scores were seen ($P = 0.0349$, $P = 0.0385$); however, no such relationship existed for the other individual or composite radiographic parameters tested. Linear regression models controlling for operative versus nonoperative treatment, gender, age, and occurrence of a complication found a significant relationship between ulnar positivity >2 mm and change in DASH between baseline and 12 months (0.0466) as well as SF-36 PCS between 0 and 12 months (0.0383).

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Conclusion: In high-functioning elderly patients, surgical treatment produced a better radiographic result than cast treatment; however, the functional outcomes at 1 year are not statistically different. Univariate and regression analysis demonstrated a relationship between ulnar positive variance and poorer functional outcomes, but no such relationship was found for other radiographic parameters or a composite radiographic score.