

Operative versus Nonoperative Management of Distal Radius Fractures in Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials with an Elderly Subgroup Analysis

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Purpose: This systematic review and meta-analysis aimed to compare the outcome of operative and nonoperative management in adults with distal radius fractures, with an additional elderly subgroup analysis. The primary outcome was the 12-month Patient-Rated Wrist Evaluation (PRWE). Additional outcomes were Disabilities of Arm, Shoulder and Hand (DASH) score, grip strength, complications, and radiographic parameters.

Methods: Randomized controlled trials of patients aged ≥ 18 years with dorsally displaced distal radius fractures that were closed or Gustilo grade I open were included. Studies compared operative intervention with nonoperative management. Operative management included open reduction and internal fixation, Kirschner wiring, or external fixation. Nonoperative management was cast/splint immobilization with or without closed reduction. Searches were performed using MEDLINE, Embase, CINAHL (Cumulative Index to Nursing and Allied Health Literature), PubMed, and CENTRAL (Cochrane Central Register of Controlled Trials). Version 2 of the Cochrane risk-of-bias tool was used.

Results: After screening 1258 studies, 16 trials with 1947 patients (mean age 66 years, range 20–98 years, 76% female) were included in the meta-analysis. Six studies reported outcomes in the elderly (≥ 65 years). Eight studies reported on the PRWE score and there was a statistically but not clinically significant difference at the primary outcome point of 12 months (mean difference [MD] -3.30 , 95% confidence interval [CI] -5.66 to -0.94 , $P = 0.006$) and at 12 weeks (MD -8.70 , 95% CI -14.45 to -2.95 , $P = 0.003$). Four studies reported on scores in the elderly and there was no statistically significant difference at 12 weeks (MD -8.53 , 95% CI -18.13 to 1.07 , $P = 0.08$) or 12 months (MD -2.60 , 95% CI -0.51 to 0.30 , $P = 0.08$). In all patients, there was a statistically but not clinically significant difference in DASH score at 12 weeks (MD -10.18 , 95% CI -14.98 to -5.38 , $P < 0.0001$) and 12 months (MD -3.49 , 95% CI -5.69 to -1.29 , $P = 0.002$). Two studies featured only elderly patients, with no clinically important difference at 12 weeks (MD -7.07 , 95% CI -11.77 to -2.37 , $P = 0.003$) or statistically significant difference at 12 months (MD -3.32 , 95% CI -7.03 to 0.38 , $P = 0.08$).

Conclusion: There was no clinically important difference in patient-reported outcome according to PRWE or DASH in either the short- (12 weeks) or mid-term (12 months) in the adult group as a whole or in the elderly subgroup when comparing operative and nonoperative management of distal radius fractures.