

**Surgery Versus Cast Immobilization for Displaced Intra-Articular Distal Radius Fractures in Elderly Patients: A Randomized Controlled Multicenter Trial**

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**Purpose:** The best treatment strategy for displaced intra-articular distal radial fractures in elderly patients with poor bone quality is still controversial. In this randomized controlled multicenter trial we investigated whether surgical management is more effective than cast immobilization in patients over 65 years.

**Methods:** Of 737 eligible individuals, 185 patients with an intra-articular distal radius fracture (AO/OTA C1, C2, C3) agreed to participate. 94 participants were assigned to surgical management with volar locking plate fixation and 91 to closed reduction and cast immobilization for 6 weeks. The primary outcome was the Short Form-36 physical component summary score (SF-36 PCS) 1 year after randomization. We also assessed other SF-36 domains, the Disabilities of the Arm, Shoulder and Hand (DASH) score, the EuroQol-5D (EQ-5D) visual analog scale (VAS) and utility index, wrist range of motion (ROM), and radiographic evaluation of the wrist 3 and 12 months after randomization.

**Results:** Both groups showed similar baseline characteristics concerning age, gender, fracture severity and activity status. 37 (41%) patients assigned to cast immobilization subsequently underwent surgery due to significant loss of reduction. After 1 year, surgery was not superior to cast treatment (SF-36 PCS mean difference 3.3, 95% confidence interval -0.2 to 6.8) in the intent-to-treat population. Also, no statistical or clinical benefit of surgery was apparent with regard to mean differences in DASH scores (-5.0, 95% confidence interval [CI] -11.0 to 1.0) and EQ-5D VAS scores (3.0, 95% CI -1.9 to 7.9). The surgical group showed a faster improvement in ROM of the wrist after 3 months ( $P < 0.05$ ), but after 1 year there were no significant differences of wrist ROM in all planes between both groups. Surgical management achieved a significant better anatomic restoration of the distal radius in palmar tilt, ulnar variance, and radial height (each  $P < 0.05$ ), but this finding was not associated with superior functional results. Outcome results were similar when analyzed according to the treatment actually received.

**Conclusion:** In elderly patients with a displaced intra-articular distal radius fracture, surgical fixation with volar locking plates was not superior to cast immobilization in terms of health-related quality of life and wrist function 1 year after the intervention. Cast immobilization remains the primary treatment option in this patient group, and second-line surgery in case of cast treatment failure does not compromise late outcome results.