Is Cast Treatment Noninferior to Surgery for Elderly Patients With Displaced Intra-Articular Type C Distal Radius Fractures? A Randomized Controlled Noninferiority Trial

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Purpose: This study aimed to determine whether cast treatment is noninferior to surgical treatment for patients aged 65 years or older with displaced intra-articular distal radius fractures with nonacceptable fracture characteristics.

Methods: This study used a randomized noninferiority trial design and recruited participants from 19 teaching hospitals. Eligible participants had to be at least 65 years old, living independently at home, and present with a completely intra-articular distal radius fracture of AO type C. The fracture needed to have a nonacceptable position according to at least 1 criterion from the guideline. 138 participants were randomized with a mean age of 76 years (standard deviation [SD] 6.0). After 12 months, 126 patients (91%) completed the trial. Participants were randomized between cast treatment and open reduction and locking plate fixation. The primary outcome was the Patient Rated Wrist Evaluation (PRWE) at 1-year follow-up. Secondary outcomes included the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire, quality of life (measured by the EuroQol-5 Dimensions [EQ-5D]), range of motion, grip strength, and complications. Primary analyses were linear mixed models with an intention-to-treat approach.

Results: The mean PRWE score at the final follow-up (12 months) for the cast treatment group was 20.4 (95% confidence interval [CI], 15.3 to 25.6) and in the surgical group, it was 14.5 (95% CI, 9.9 to 19.0). The primary intention-to-treat crude analysis was inconclusive regarding noninferiority, with a between-group difference of 6.0 points (95% CI, –2.1 to 14.1) in favor of surgery. However, in a secondary analysis, noninferiority was demonstrated after correction for baseline covariates. Short-term follow-up results showed that patients treated with a cast had significantly worse PRWE scores up to 9 months after trauma. Up to 6 months, this difference was also clinically relevant. A subgroup analysis showed that physiologically young patients benefited most from surgical treatment.

Conclusion: In patients aged 65 years or older who have displaced intra-articular distal radius fractures with nonacceptable fracture characteristics, the primary outcome did not demonstrate noninferiority of cast treatment compared with surgical treatment at 1-year follow-up. The potential benefit of surgery is most prominent in the short term and for physiologically young patients.