

## **Objective Functional Recovery and its Impact on Subjective Function and Satisfaction Following Distal Radius Fractures in Patients Over 55 Years**

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**Purpose:** We sought to examine the association between early physical examination findings and longer-term patient-reported outcome measures in patients over 55 years sustaining distal radius fractures.

**Methods:** Patients aged over 55 years presenting to a Level I trauma center with isolated distal radius fragility fractures were recruited to a prospective observational cohort study. Fractures treated operatively and nonoperatively were included. Patient-Rated Wrist Evaluation (PRWE), Disabilities of the Arm, Shoulder and Hand (DASH), and Centre for Epidemiologic Studies Depression (CES-D) scores were collected at baseline, 3 months, 6 months, and 1 year. The Solomon patient satisfaction scale was used at 1 year to assess light activities, heavy activities, and pain. Physical examination occurred at 3 months, including range of motion measures and grip and pinch strength, with accepted thresholds used to assess recovery of functional wrist range of motion (FROM).

**Results:** A total of 208 patients were included: mean age was 67 years, 89% were female, and 54% were managed nonoperatively. Physical examination demonstrated significant differences in all planes of FROM in comparison to the uninjured side at 3 months, with most pronounced variances occurring in flexion (mean 53° vs 72°,  $P < 0.001$ ) and extension (mean 65° vs 92°,  $P < 0.001$ ). 25% of patients reported ulnar-sided pain. Mean grip strength was reduced from 24.2 kg to 14.1 kg ( $P < 0.001$ ) and pinch strength from 5.2 kg to 3.9 kg ( $P < 0.001$ ). FROM was regained in 129 patients (62%). No association was seen between treatment and recovery of FROM ( $P = 0.891$ ). Lack of FROM was associated with higher mean DASH and PRWE scores at 3 months (DASH 35.3 vs 20.7,  $P < 0.001$ ; PRWE 43.2 vs 19.6,  $P < 0.01$ ), 6 months (DASH 26.6 vs 11.7,  $P < 0.001$ ; PRWE 29.7 vs 14.4,  $P < 0.01$ ), and 1 year (DASH 18.9 vs 11.0,  $P < 0.02$ ; PRWE 18.9 vs 11.0,  $P < 0.02$ ), and decreased patient satisfaction across all 3 Solomon scale domains ( $P < 0.005$ ). While there was no association between physical examination and CES-D scores at baseline and 1 year, lack of FROM was linked to increased depressive signs at 3 months ( $P < 0.003$ ).

**Conclusion:** In patients over 55 years with distal radius fractures, loss of FROM was common, and was not impacted by surgical treatment. Failure to regain FROM was associated with worse depression and satisfaction scores, and reduced upper extremity function. Interventions to promote return of early FROM require further investigation.