The Trajectory of Long-Term Recovery Following Open Reduction and Internal Fixation for Distal Radius Fractures

Gabriel Larose, MD*; Henry M. Broekhuyse, MD; Pierre Guy, MD; Peter J. O'Brien, MD; Darren Roffey, PhD; Kelly Ann Lefaivre, MD, MS*
Vancouver General Hospital, Vancouver, BC, Canada

Purpose: Distal radius fractures are common injuries. There has been a trend toward surgical treatment to improve patient outcomes. However, long-term studies evaluating the trajectory of recovery over time are lacking in the literature. Previous research on this injury has focused on the outcomes of open reduction and internal fixation (ORIF), yet most studies have drawn arbitrary end points to evaluate the success of this treatment. Trajectory studies help us understand the expected clinical course, which then inform prognosis and research planning.

Methods: Patients were enrolled between 2005 and 2013 in a prospective trauma database. All patients gave informed consent. Enrolled patients had a distal radius fracture treated by ORIF at a single Level I trauma center. Wrist function was assessed using the Patient-Related Wrist Evaluation (PRWE) score, with assessments performed at baseline, 6 months, 1 year, and 5 years. Medical comorbidities, ISS, age, and gender were also recorded. Proportionate change was assessed using minimal clinically important difference (MCID).

Results: 391 patients were recruited. Mean age was 51 years (range, 17-93); 67% were women. Mean pre-injury PRWE score at baseline was 1.3 (standard deviation [SD] 3.1). At 6 months the mean PWRE was 18.9 (SD 16.6, $P<0.001$). Substantive improvement was observed between 6 months and 1 year (1 year: 14.2 [SD 16.2], $P<0.001$). Although 23% of patients have at least an MCID between 6 months and 1 year, nearly half of patients are not within MCID from their baseline PRWE score at 1 year (39.5%). Improvement leveled off between 1 year and 5 years (8.9 [SD 13.4], $P<0.001$); however, 20% of patients did manage to achieve MCID improvements between 1 year and 5 years. At 5-year follow-up, PRWE scores remained statistically worse compared to baseline ($P = 0.01$), while 25% of patients were still at least 1 MCID from their baseline PRWE score.

Conclusion: The trajectory of recovery after ORIF for distal radius fractures showed an initial decline in PRWE scores after surgery, then an incline in trajectory with ongoing substantial disability at 6 months, followed by significant improvements up to 1 year. PRWE scores continued to improve between 1 year and 5 years, albeit to a lesser extent, as demonstrated by patients reporting MCIDs. Alas, there remains statistically and clinically relevant wrist disability at 5 years following ORIF for distal radius fractures.