

Operative Treatment of Distal Radius Fractures in Patients over 60 is Associated with Higher Likelihood of Experiencing Early Substantial Clinical Benefit Compared to Nonsurgical Treatment

Derek Schloemann¹, Megan Reitenbach, Bilal Mahmood, Warren C Hammert²

¹University of Rochester, ²Duke University Medical Center

INTRODUCTION:

Multiple studies have reported similar outcomes of distal radius fractures (DRFs) in elderly patients treated surgically and nonsurgically at one year after injury. The short-term recovery has not been fully-elucidated. If it could be demonstrated that surgically-treated patients have more than minimal improvement after surgery, as detected by the substantial clinical benefit based on the response to an anchor question reporting improvement at early timepoints, this information could help with shared decision making and demonstrate the benefits of surgery in this population. Our purpose was to evaluate the proportion of patients who experience substantial clinical improvement after surgical and nonsurgical treatment of distal radius fractures in elderly patients at short-term follow up, to determine whether treatment choice was associated with differences in odds of achieving substantial clinical improvement at short-term follow up.

METHODS:

Patients over 60 years of age sustaining DRFs from 2015 to 2022 who underwent surgical or nonsurgical treatment were retrospectively identified using Current Procedural Terminology codes in this retrospective cohort study. Our primary outcome of interest was the patient responses to the health status questionnaire (as the clinical anchor) at the encounter closest to 6 weeks postoperatively. Patients were excluded if pre- and post-surgery clinical anchor responses were not completed. We estimated a multinomial logistic regression model to evaluate the association of surgical treatment with outcomes after controlling for patient factors. $P < 0.05$ was considered statistically significant.

RESULTS:

A total of 279 patients with DRFs were included in our study. There were 132 who underwent nonsurgical treatment and 147 who underwent surgical treatment. The median (interquartile range) follow up was 35 (14 to 69) days. The mean (standard deviation) age was 74.07 (9.52) in the nonsurgical group and 70.73 (7.81) in the operative group (Table 1). There were 104 (78.8%) women in the nonsurgical group and 128 (87.1%) women in the surgical group. There were 59 (44.7%) patients in the nonsurgical group who reported feeling "Much Better" compared to 80 (54.4%) in the surgical group. There were 35 (26.5%) patients in the nonsurgical group who reported feeling "Mildly Better" compared to 42 (28.6%) in the surgical group. There were 38 (28.8%) patients in the nonsurgical group who reported feeling "No Change" compared to 25 (17.0%) in the surgical group. After controlling for patient factors on multivariable analysis, the relative risk of feeling "Much Better" relative to feeling "No Change" was 111% higher in the surgical group compared to the nonsurgical group (relative risk ratio [RRR] 2.11, 95% CI 1.08 to 4.12, $P = 0.03$) (Table 2). There was no significant difference in the relative risk of feeling "Mildly Better" relative to feeling "No Change" in the surgical group compared to the nonsurgical group (RRR 1.50, 95% CI 0.72 to 3.14, $P = 0.28$).

DISCUSSION AND CONCLUSION:

We found that patients over 60 years of age treated with open reduction and internal fixation of DRFs were more likely to report feeling much better than those undergoing nonsurgical treatment of DRFs at short-term follow up, indicating a substantial clinical benefit for surgical treatment in this age group. These results will help inform the relative risks and benefits of both treatment options and inform shared decision making between patients and surgeons.

Table 1. Patient Characteristics.

	Nonoperative N=132	Operative N=147	Total N=279
Response to Anchor Question: N (%)			
"Much Better"	59 (44.7%)	80 (54.4%)	139 (49.8%)
"Mildly Better"	35 (26.5%)	42 (28.6%)	77 (27.6%)
"No Change"	38 (28.8%)	25 (17.0%)	63 (22.6%)
Age: Mean (Standard Deviation)	74.07 (9.52)	70.73 (7.81)	72.31 (8.80)
Gender: N (%)			
Men	28 (21.2%)	19 (12.9%)	47 (16.8%)
Women	104 (78.8%)	128 (87.1%)	232 (83.2%)
Race and Ethnicity: N (%)			
Non-Hispanic White	123 (93.2%)	138 (93.9%)	261 (93.5%)
Non-Hispanic Black	4 (3.0%)	4 (2.7%)	8 (2.9%)
Hispanic	2 (1.5%)	1 (0.7%)	3 (1.1%)
Other	3 (2.3%)	4 (2.7%)	7 (2.5%)
BMI: N (%)			
<25	40 (30.3%)	62 (42.2%)	102 (36.6%)
25-30	32 (24.2%)	45 (30.6%)	77 (27.6%)
>30	42 (31.8%)	40 (27.2%)	82 (29.4%)
Missing	18 (13.6%)	0 (0.0%)	18 (6.5%)
Insurance: N (%)			
Private	61 (46.2%)	64 (43.5%)	125 (44.8%)
Medicare	63 (47.7%)	70 (47.6%)	133 (47.7%)
Medicaid	8 (6.1%)	13 (8.8%)	21 (7.5%)

Table 2: Results of multivariable multinomial logistic regression model for response to anchor question at short-term follow-up.

N=279		RRR	95% CI
"Much Better" Relative to "No Change"			
Treatment		Reference	
Nonoperative		Reference	
Operative	2.11*		(1.08 to 4.12)
Age	0.98*		(0.92 to 0.99)
Gender			
Men		Reference	
Women	0.91		(0.38 to 2.19)
Race and Ethnicity			
Non-Hispanic White		Reference	
Non-Hispanic Black	0.20		(0.02 to 1.20)
Hispanic	0.44		(0.02 to 8.72)
Other	0.25		(0.02 to 3.20)
BMI			
<25		Reference	
25-30	1.57		(0.68 to 3.64)
>30	0.67		(0.23 to 1.83)
Missing	3.64		(0.84 to 15.74)
Insurance			
Private		Reference	
Medicare	0.96		(0.49 to 1.89)
Medicaid	0.49		(0.14 to 1.68)
"Mildly Better" Relative to "No Change"			
Treatment			
Nonoperative		Reference	
Operative	1.50		(0.72 to 3.14)
Age	0.94**		(0.90 to 0.98)
Gender			
Men		Reference	
Women	0.75		(0.29 to 1.92)
Race and Ethnicity			
Non-Hispanic White		Reference	
Non-Hispanic Black	0.32		(0.02 to 1.95)
Hispanic	0.50		(0.02 to 10.20)
Other	2.80		(0.18 to 20.58)
BMI			
<25		Reference	
25-30	1.64		(0.65 to 4.16)
>30	0.83		(0.36 to 1.92)
Missing	0.77		(0.11 to 5.60)
Insurance			
Private		Reference	
Medicare	0.63		(0.30 to 1.31)
Medicaid	0.30		(0.07 to 1.21)

Results of multivariable multinomial logistic regression model for outcome.
Abbreviations: RRR: Relative risk ratio, CI: Confidence interval, * P<0.05, ** P<0.01, *** P<0.001.