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Outcomes Following Open Reduction and Internal Fixation for Distal Humerus Fracture: Does Handedness Matter?

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(*) indicates primary project advisor

(**) indicates another student who is declaring the same project as primary for SI

Introduction

- The key outcome following distal humerus fractures is functional ability
- Consistent physical therapy is important to achieve this outcome and maximize range of elbow joint motion
- The “need” to recover dominant extremity function may play a role in expediting elbow recovery





Objectives & Hypothesis

- To our knowledge, no study has assessed the relationship between hand dominance and distal humerus fracture outcomes
- This study sought to compare post-operative outcomes and complications between patients with distal humerus fractures treated with open reduction and internal fixation of their non-dominant vs dominant arm

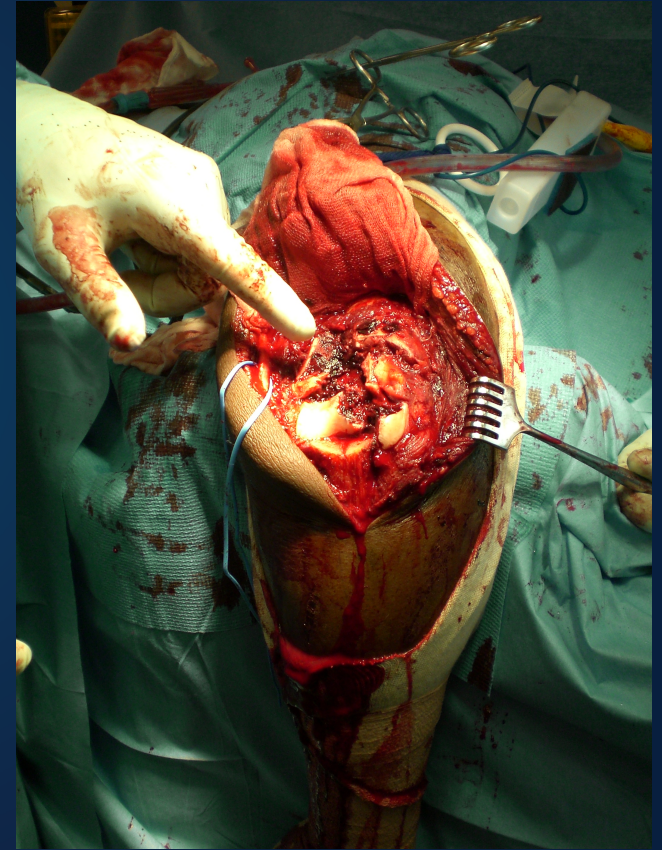
Materials & Methods

- Retrospective review of all distal humerus fractures between 2011 and 2015
- 69 distal humerus fracture patients (OTA/AO type 13) treated with ORIF and at least 6-month follow up
- Categorized by whether fracture was in dominant or non-dominant extremity



Materials & Methods

- A retrospective chart review gathered data on demographics, hand dominance, injury information, and surgical management
- Post-operative outcomes: complications, time to union, painful hardware, removal of hardware, Mayo Elbow Performance Index (MEPI), elbow ROM
- Statistical analyses used independent samples t-tests, Fisher exact tests, and chi-square tests as appropriate



- 40 (58%) dominant extremity
- 29 (42%) non-dominant extremity
- Mean overall follow-up: 14.1 ± 10.5 months
- No difference in mean follow up time, demographics, injury information, or surgical management between groups



Results: Post Op Complications

Variable	Non-Dominant Hand (N = 40)	Dominant Hand (N = 29)	P Value
Any Complication, N (%)	14 (35.0)	4 (13.8)	0.048*
Fracture Nonunion	0 (0.0)	2 (6.9)	0.173
Hardware Failure	5 (12.5)	1 (3.4)	0.389
Elbow Contracture	10 (25.0)	3 (10.3)	0.124
Wound Dehiscence	1 (2.5)	0 (0.0)	1.000

Patients who experienced multiple post-operative complications were only accounted for once in the Any Complications category. Asterisks represent significant differences.

Results: Post Op Complications

Variable	Non-Dominant Hand (N = 40)	Dominant Hand (N = 29)	P Value
Time to Union (Months), Mean ± SD	4.7 ± 2.0	4.6 ± 3.4	0.936
Painful Hardware, N (%)	12 (30.0)	2 (6.9)	0.018*
Removal of Hardware, N (%)	14 (35.0)	1 (3.4)	0.002*
MEPI Score, Mean ± SD†	86.4 ± 18.8	94.7 ± 10.7	0.037*
Elbow Extension (deg)†	16.7 ± 18.4	12.8 ± 7.8	0.239
Elbow Flexion (deg) †	121.0 ± 20.9	125.3 ± 25.1	0.444
Total Elbow Arc (deg) †	104.3 ± 35.2	112.5 ± 29.6	0.314

Abbreviations: MEPI, Mayo Elbow Performance Index. Daggers (†) represent outcomes measured at latest follow up. Asterisks represent significant differences. Deg, Degrees.



Discussion

- Patients who sustain a distal humerus fracture of their non-dominant arm treated with ORIF experience more post-operative complications, painful hardware, removal of hardware, and worse functional recovery
- This may be related to limitation of active arm movement during the recovery period, resulting in a higher prevalence of symptoms



Conclusion

- When counseling patients, physicians and physical therapists should emphasize the importance of physical therapy and maintaining arm movement especially when the non-dominant arm is involved