

# Is Time Truly of the Essence? Outcomes of Open Distal Radius Fracture Management

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**INTRODUCTION:** The standard of care for managing open distal radius fractures is urgent irrigation and debridement along with operative fixation. Herein, we investigate whether open distal radius fractures (ODRF) treated after 24 hours from time of injury have an increased risk of infection or overall complication profile compared to those treated urgently. We hypothesize that there is no significant difference in complications in ODRFs treated after 24 hours compared to those treated within 24 hours from injury.

**METHODS:** An institutional review board-approved retrospective chart review was performed of all patients treated for ODRF over a 6-year period from 2015 to 2020 at an academic institution in a large metropolitan city, including level I trauma centers. Inclusion criteria included all patients older than 18 years of age with an open fracture of the distal radius. Our primary outcomes were postoperative surgical complications. The postoperative surgical complications reviewed included surgical site infections, need for reoperation for repeat irrigation and debridement, delayed soft tissue healing or wound complications, loss of reduction, nonunion, and malunion of the distal radius fractures. Pearson chi-square, Fisher's exact test, Kendall's tau test, and Mann-Whitney U tests were used for statistical analysis. All statistical tests were two-sided with  $p < 0.05$  considered statistically significant.

**RESULTS:** Ninety-four patients were treated for ODRF. Mean (SD) age at time of injury was 58.6 (17.41) years. Sixteen patients (16.8%) had postoperative complications: 2 infections, 8 reoperations, 4 wound healing complications, 2 reduction losses, 7 nonunions, and 1 malunion [Table 1]. For Gustilo classification fracture grade, 66 (72.5%) had a type I distal radius fracture, 17 (18.7%) had a type II fracture, and 8 (8.8%) had a type III fracture, and there was no significant association between Gustilo classification and postoperative complications ( $p = 0.068$ ). Regarding mechanism of injury, 74.4% had a low energy and 26.6% had a high energy injury, which was not significantly correlated for any postoperative complications (0.352). Likewise, age ( $p=0.197$ ) and fracture grade ( $p=0.068$ ) were not significant factors. Mean (SD) open wound size was 1.6 (1.66) cm and did not correlate with any postoperative complications ( $p=0.093$ ). Mean (SD) time from injury presentation to the ER and first dose of intravenous antibiotics was 4.7 (14.88) hours ( $p=0.186$ ) and mean (SD) time from presentation to the ER and operative treatment was 19.1 (30.57) hours ( $p=0.092$ ), which were both not significant factors for postoperative complications. Eleven patients (11.7%) were treated greater than 24 hours after presentation to the ER, which was not significantly distinct from those treated within 24 hours ( $p=1.000$ ).

**DISCUSSION AND CONCLUSION:** This study demonstrates that patients with open distal radius fractures treated after 24 hours did not have a greater risk of postoperative complications such as surgical site infections and nonunion. Regarding factors that may influence urgent treatment, age, energy and mechanism of injury, and fracture grade were all not statistically significant for any postoperative complications in ODRF management. To the authors' knowledge, this is the largest documented series to date of patients with open distal radius fractures with a cohort of 94 patients specifically looking at the outcomes and timing of treatment for open distal radius fractures.