

Forearm Shaft Fracture Fixation: Does Plate Type or Screw Size Matter?

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INTRODUCTION:

Forearm shaft fractures of the radius and/or ulna are typically repaired with plate and screws, with generally 3.5mm non-locking screws recommended. However, smaller plate and screws, either non-locking or locking, can be applied as well. The purpose of this study was to retrospectively review whether fracture healing rates and related complications are affected by plate size and type.

METHODS:

Patient demographic and descriptive fracture data was retrospectively collected for all patients treated between 2017 through 2021, at a multi-provider and multi-location single institution, with a forearm shaft fracture treated with a repair with a CPT of 25515 and/or 25545. Inclusion criteria was a minimum radiographic follow up of 60 days and/or until fracture union was confirmed. Patient characteristics, fracture location, plate size, screw type, and union characteristics were recorded.

RESULTS:

A total of 158 patients in 164 fractures met inclusion criteria. The average number of days until the first follow up x-ray was 24.15 days and the average number of days until last follow-up x-ray was 155.5 days. There were 60 (37.9%) females and 98 (62.0%) males included in this study. The mean age at time of injury was 41.3 (± 22.5). There were 89 (48.6%) radius fractures and 94 (51.4%) ulna fractures. There were 20 (10.9%) proximal third, 94 (51.4%) mid shaft and 69 (37.7%) distal third fractures of the radius/ulna. The types of plates applied included limited-contact dynamic compression plates in 146 (79.8%) cases, metaphyseal-diaphyseal plates in 10 (5.5%) cases, reconstruction plates in 25 (13.7%) cases, one-third tubular plates in 2 (1.1%) cases. Screw sizes consisted of 3.5mm screws in 96 cases (52.5%), while 2.4/2.5/2.7mm screws were used 87 cases (47.5%). Fracture union was confirmed in 156 cases (95.7%) while there were 8 (4.3%) nonunion cases. Among the 8 nonunion cases, 5 involved the ulna (62.5%) and 3 involved the radius (37.5%). Also among the nonunions, 6 cases (75%) utilized 3.5mm screws while 2 (25%) cases utilized 2.7mm screws.

DISCUSSION AND CONCLUSION:

This study confirms that fracture union is high following all types of plate fixation of radius and/or ulna fractures. Moreover, smaller screw sizes did not effect fracture union rates. Choice of plate type and screw diameter should be based on patient characteristics and surgeon preference, and need not be limited to only 3.5mm plate and screws.