

The Effect of Canal Fill on Pediatric Forearm Fractures Treated with Intramedullary Nailing

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Background

- Intramedullary nailing is one of the preferred operative fixation methods for pediatric diaphyseal forearm fractures.
- Currently, there are no clinical studies supporting a specific nail fit for optimal outcomes in these fractures.

✓ **Aim:** To assess the impact of nail diameter to medullary canal diameter (ND/MCD) ratio on postoperative outcomes in pediatric patients treated with intramedullary nailing for forearm fractures

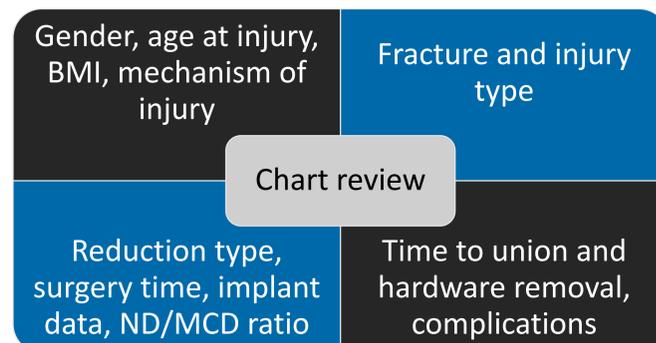
Methods

Inclusion criteria:

- Age <18 years
- Diaphyseal forearm fractures (OTA 22A and 22B) treated with intramedullary fixation 2004-2014

Exclusion criteria:

- Pathologic and radial neck fractures
- Follow-up <6 months



Results

- Average age: 9.6 years (range: 2.0-18 years)
- Average ND/MCD ratio: 52.2% (range: 27.3-77.6%)
- Majority:
 - Male (49/73, 67%)
 - Healthy weight, BMI percentile 5th to <85th (69%)
 - ND/MCD ratio >40% (89%)



Figure 1. One of the study patients with an ND/MCD ratio of <40% at 4 weeks post-op. The patient had uneventful recovery.

- Patients >10 years of age were more likely to develop delayed fracture union [p=0.0490].
- Rates of complications were comparable between fractures with ND/MCD ratios of <40%, 40-49%, 50-59%, and ≥60% [p=0.7135].
- ND/MCD ratio was not associated with time to union [p=0.1488], complications [p=0.9922], or time to hardware removal [p=0.1737].

Results

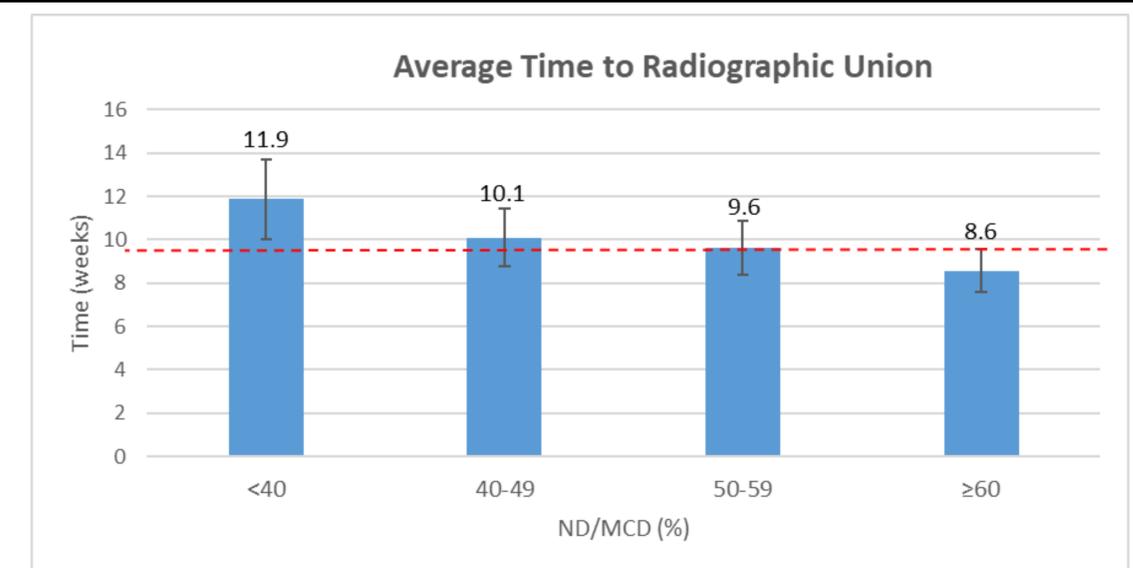


Figure 2. Average time to radiographic union in the ND/MCD ratio groups of <40%, 40-49%, 50-59%, and ≥60%.

- ✓ Trend towards shorter times to union with an increased ND/MCD ratio but no statistical significance [p=0.6073]

Significance

- ✓ Intramedullary nail to canal diameter (ND/MCD) ratio is not associated with fracture healing outcomes including complications, time to union, or time to hardware removal in pediatric diaphyseal forearm fractures.
- ✓ There may be a trend towards shorter times to union with an increased ND/MCD ratio but its significance could not be established.

Disclosures

None of the authors have any relevant disclosures or conflicts of interest in regards to this research.