Does Adding a Plate Really Take Just 10 Minutes?: A Comparative Analysis of Resource Utilization and Early Outcomes in Distal Femur Fracture Fixation

Ryan Serbin, Calvin Chandler, Timothy Yin, Ziqing Yu, Rachel Seymour[1], Joseph R Hsu, Kevin Daniel Phelps[1], EMIT Collaborative

[1]Atrium Health Musculoskeletal Institute

INTRODUCTION: Implications of implant choice for distal femur fractures on resource utilization and outcomes are unclear. This study compares intramedullary nailing (IMN), plating, and IMN+plate for operative duration, radiation, blood loss, weightbearing, and complications.

METHODS: Retrospective review of 89 isolated OTA 33A-C distal femur fractures treated operatively from 2018-2022 at a level 1 trauma center. Patients grouped by fixation: IMN (n=41), plate (n=21), or IMN+plate (n=27). Outcomes measured: operative time, radiation dose, estimated blood loss (EBL), weightbearing status, nonunion, complications. Multivariable regression analyzed association of implant choice with operative time, adjusting for key variables.

RESULTS: Adding a plate to IMN increased median operative time by 114 minutes compared to IMN alone (230 vs. 114) and 76 minutes compared to plate alone (230 vs. 154). IMN+plate had significantly higher median radiation dose (50.6 mGy) compared to IMN (20.8 mGy) and plate (19.5 mGy) groups, with no significant difference between IMN and plate groups. Median EBL was significantly higher in the IMN+plate group (250 mL) compared to IMN (150 mL) but not plate fixation (200 mL). Postoperative weightbearing differed significantly between IMN (58.5%) and plate (14.3%), and between plate and IMN+plate (51.9%). Nonunion rates were significantly lower in IMN+plate compared to plate (3.7% vs. 33.3%) but not IMN (24.4%). Overall complication rates did not differ significantly. Fixation method remained significantly associated with operative time after adjusting for OTA classification, injury energy, open fracture, age, and sex.

DISCUSSION AND CONCLUSION: Adding a plate to IMN significantly increased median operative time, radiation, and EBL compared to IMN or plate alone. However, the IMN+plate group demonstrated a significantly lower nonunion rate compared to plate fixation. These findings highlight the importance of considering resource utilization and patient outcomes when determining the optimal implant selection.