

Is Fixing a Fracture Below a Short Nail Really Easier?**A Comparative Study of Peri-Implant Fractures**

Phillip M. Mitchell, MD; Aleksander Mika, MD; Jacquelyn S. Pennings, PhD; Claudia Davidson, MPH; Cade Morris, MD; Jonathon Savakus, MD

Purpose: Cephalomedullary nails are a commonly used implant for the treatment of intertrochanteric (31A3.1-3) femur fractures. Both long and short devices are used with no consensus on ideal nail length. Each implant has relative advantages and disadvantages, but the rate of peri-implant fracture is equivocal between constructs. Determining the clinical sequelae of fixing peri-implant fractures around short versus long nails may provide valuable information for surgeons choosing between these 2 options. The purpose of this study was to compare injury patterns and treatment outcomes following peri-implant fractures below short or long cephalomedullary nails.

Methods: This was a single center retrospective cohort study that identified 37 patients referred for treatment of peri-implant fractures around short and long cephalomedullary nails (n = 17 short, n = 20 long). We compared fracture pattern, treatment strategy, operative details, and outcomes between these 2 groups.

Results: The average age was 63 years and 34% were male. Short nails were primarily associated with diaphyseal fractures (15 of 17, 88%) and treated most commonly with revision intramedullary nailing (10 of 17, 59%). Long nails were associated with metaphyseal fractures (16 of 20, 75%) and treated most frequently with plate and screw fixation (19 of 20, 95%). When comparing operative details based on nail length, we found no differences in operative time or x-ray use. There was a significant decrease in estimated blood loss (P = 0.027) among the short nail group, although we found no difference in transfusion requirement. Patients repaired following fracture around a short nail also had a higher medical complication rate (eg, urinary tract infection, etc) when compared to those patients with fracture around a long nail (P = 0.026). There was no difference in hardware failure or implant complication. We found no difference in discharge destination, weightbearing status, or length of stay when comparing the 2 groups. When controlling for other variables including nail length, transfusion requirement was the only factor significantly associated with length of stay (P = 0.006).

Conclusion: This series is the largest collection of fractures below a cephalomedullary nail to date. Despite a difference in estimated blood loss and complications, there were no differences in revision surgery for fracture below a short or long cephalomedullary nail. Larger studies are required to further elucidate the clinical implications.