Revision Rates and Complications of 3 Different Treatments for Intertrochanteric Femur Fractures

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Purpose: The number of hip fractures is expected to reach 6.26 million worldwide by the year 2050, with half of these fractures being OTA 31-A intertrochanteric (IT) fractures. The primary purpose of the current study was to evaluate peri-implant fracture within 5 years of surgery for patients receiving either plating (open reduction and internal fixation [ORIF]), long cephalomedullary nail (LCMN), or short cephalomedullary nail (SCMN). We also compared rates of other complications between the groups.

Methods: A review of data collected prospectively through an institutional database of patients with IT fractures over a 5-year period from 2016 to 2021 was performed. Patients were identified through pertinent CPT and ICD-9 / ICD-10 codes. Patients age 18-89 years with IT femur fractures were reviewed for peri-implant fracture and associated revision surgeries for a minimum of 12 months after their index surgery looking at length of hospitalization, death, DVT (deep vein thrombosis) within 6 months of surgery, transfusion during hospitalization, length of stay, and rates of discharge to home. Patients were stratified by medical comorbidities (utilizing the Elixhauser Comorbidity Index), gender, age, race, and smoking status. Inclusion criteria were patients aged at least 18 years up to 89 years (due to database restrictions) with IT and subtrochanteric femur fractures. Patients excluded from analysis were those who were pregnant, had diagnosis of any cancer, were revised for nonunion, age less than 18 or over 89 years, or had a measured outcome present on initial encounter.

Results: A total of 13,197 patients were included in the study. 5,924 patients received LCMN, 6,464 SCMN, and 809 underwent plating. Significant differences in 12-month adverse events were observed in patients aged 30-49 years compared to those 65-89 years (odds ratio [OR] 2.9, $P = 0.01$). LCMN had higher rates of adverse events compared to SCMN (OR 1.53, $P = 0.04$). Additionally, the rates of blood transfusion after the index surgery were significantly higher in the long nail (0.6%) and plate / screw devices (PSDs) (0.9%) compared to short nails (0.2%; $P<0.05$) but not significantly different when comparing LCMN to PSD. No difference was noted in the distal peri-implant fractures between any of the devices used in the index surgery (0.88% SCMN, 0.84% LCMN, 0.74% PSD; $P = 0.89$). No differences were seen for readmission rates for revision ($P = 0.98$), the need for all-cause hardware removal ($P = 0.33$), and rates of DVT ($P = 0.53$). Additionally, rates of discharge home versus care managed facility after revision procedure were not statistically significant ($P = 0.88$).

Conclusion: The use of LCMN versus SCMN in the treatment of OTA 31-A fractures does not impact the risk of peri-implant fracture or need for hardware removal or revision. Our data do not show increased perioperative morbidity after revision for distal peri-implant fractures but a larger study size may provide significant results.