

Outcomes of Proximally Locked Versus Unlocked Cephalomedullary Nail Use in Low-Energy Intertrochanteric Femur Fractures

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Purpose: Intertrochanteric femur fractures are common and are treated with a variety of implants, based on surgeon preference. Despite the frequent use of cephalomedullary nail (CMN) fixation, limited prior work has been done to compare nuances of proximal fixation technique. Whether to lock the proximal fixation into place and whether to compress the fracture via the implant are two options with no evidence to guide decision-making. This study compares the outcomes of different proximal fixation techniques in patients with low-energy intertrochanteric hip fractures.

Methods: Retrospective review was performed of all adult patients with low-energy (from standing height or equivalent) intertrochanteric hip fractures (AO/OTA Fracture Classification 31A1 [n = 44], 31A2 [n = 118]) treated with CMNs at a Level I trauma center between 2014 and 2020. 162 patients, 71% females, with mean age 76 years (range, 24-98) were included. The same implant was used in all patients. The type of proximal fixation, ie, blade (n = 149, 92%) versus screw (n = 13, 8%), unlocked (n = 75, 46%) versus locked (n = 87, 54%), compression using the implant (n = 72, 44%), and other technical details were recorded. Radiographic complications were documented including: varus collapse, implant penetration, and nonunion.

Results: Mean follow-up was 5.3 months and 30% of patients (n=48) developed complications related to their CMN. Lateralization of the blade / screw (>10 mm) was higher in the unlocked group (42% vs 11.5%, $P < 0.001$), with the majority (75.6%) of all cases of lateralization occurring in the unlocked group. Varus collapse was similarly observed more often in the unlocked group (10.7% vs 2.3%, $P = 0.027$). All cases of medial migration occurred in the absence of intraoperative compression ($P = 0.042$). Neither choice of blade versus screw, nor long versus short nail, was associated with complications or outcomes. No associations were found between unstable / stable fracture patterns, age, or sex, and the complications studied.

Conclusion: Cephalomedullary screw / blade lateralization and varus collapse were associated with a nonlocked proximal construct. Compressing through the device was associated with lower risk of screw / blade medialization. These data suggest that routine locking proximally to create a fixed-angle construct and compressing through the device may decrease the risk of complications.