

Can't Stop the Slide: Factors Associated With Excessive Lag Screw Sliding Following Cephalomedullary Nail Fixation of Intertrochanteric Hip Fractures

Christopher J. Pettit, BS; Carolyn Herbosa, BA; Nina D. Fisher, MD; Sanjit R. Konda, MD; Abhishek Ganta, MD; Nirmal C. Tejwani, MD; Philipp Leucht, MD; Steven Rivero, MD; Kenneth A. Egol, MD

Purpose: We sought to examine factors associated with lag screw slide following operative fixation of intertrochanteric hip fractures with cephalomedullary nails.

Methods: All patients with a type 31A1 and 31A2 intertrochanteric hip fracture were treated in a similar manner with a cephalomedullary nail (CMN) with the lag screw placed in "dynamic" mode. Patients who experienced early complete failure via "screw cutout," "cut through," or implant breakage were excluded. Lag screw position measurements were taken intraoperatively and at the patient's latest follow-up visit using the picture archiving and communications (PACS) tool. Screw slide was defined as the difference in lateral prominence of the lag screw at latest follow-up compared to its initial position. Patients were grouped based amount of screw slide (<5 mm, 5-15 mm, >15 mm). Cohorts were compared using χ^2 tests, analysis of variance tests, and multivariate regression analysis.

Results: A total of 689 fractures with a mean follow-up of 6.2 months were identified. The majority of patients (66%) experienced less than 5 mm of slide, while 31.3% had 5-15 mm and 2.7% had >15 mm of slide. The 3 cohorts were similar in terms of age, sex, race, Charlson Comorbidity Index (CCI), American Society of Anesthesiologists (ASA) class, mechanism of injury, pre-injury ambulatory status, and pre-injury use of assistive devices. There was no association between fracture pattern or nail manufacturer and the extent of screw "slide". Overall, the mean amount of slide was 3.85 mm with a standard deviation of 4.82 mm. The amount of initial screw prominence was associated with ultimate screw slide and >5 mm of initial prominence was associated with >15 mm of ultimate prominence ($P = 0.05$). Slide greater than 15 mm was associated with increased patient body mass index (BMI) ($P = 0.004$). Multivariate regression demonstrated that BMI was associated with slide greater than 15 mm (odds ratio [OR] 1.13, 95% confidence interval [CI] 1.040-1.216, $P = 0.003$).

Conclusion: In patients treated with a CMN for an intertrochanteric hip fracture there were no injury factors or fracture patterns that correlated with the ultimate amount of screw slide. Fractures that exhibited excessive lag screw slide of greater than 15 mm were associated with higher patient BMI and more than >5 mm of initial screw prominence.