Varus Malreduction Drives Cut-Out after Cephalomedullary Nailing of Intertrochanteric Fractures

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INTRODUCTION: Screw cut-out or cut-through is a highly morbid complication of cephalomedullary nailing. The purpose of this study was to assess the relationship of neck shaft angle and acute fixation failure for a specific cephalomedullary nailing system.

METHODS: This was a multicenter retrospective analysis of 688 patients with intertrochanteric fractures (AO/OTA 31A1-A3) treated with either the one manufacturer's Blade or Screw between 1/2014 and 5/2021. Neck shaft angle was measured on immediate postoperative radiographs. The primary outcome was implant failure in the form of cut-out (defined as head perforation associated with a secondary varus displacement of the neck–head fragment) or cut-through (defined as a central perforation of the screw/blade into the hip joint without any displacement of the neck–head fragment). Cut-out and cut-through were compared between patients with low or acceptable neck shaft angles (NSA) with a chi squared test and multivariate regression. Acceptable NSA was defined as >128.5°.

RESULTS: The overall incidence of acute fixation failure (cut-out or cut-through) was 3.2%. The rate of cut-out was significantly higher in patients with a NSA ≤128.5° compared to patients with an acceptable NSA (6.9% vs. 1.3%, $p<0.001$). After controlling for confounding variables (age, sex, mechanism, and fracture pattern), a neck shaft angle ≤128.5° for the system increased the risk of cut-out and cut-through (OR 4.62 [95% CI 1.74 to 12.29, $p=0.002$).

DISCUSSION AND CONCLUSION: Restoring the neck shaft angle to >128.5 degrees appears to be critical to reducing risk for acute fixation failure after cephalomedullary nailing with this system.