Implant Cut-out Following Cephalomedullary Nailing of Intertrochanteric Femur Fractures: Are Helical Blades to Blame?

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Purpose: Implant cut-out remains a common cause of cephalomedullary nail (CMN) failure and patient morbidity following surgical treatment of intertrochanteric femur fractures. Recent studies have suggested an increased rate of CMN cut-out with helical blades as opposed to lag screws. We compared rates of overall cut-out between helical blades and lag screws and used bivariate and multivariate analysis to determine the role of proximal fixation method among other variables on risk for cut-out. Subgroup analysis was performed on the basis of failure mechanism; superior migration versus medial perforation.

Methods: 313 patient charts were retrospectively reviewed over an 8-year period; 245 patients were treated with helical blades and 68 with lag screws. Radiographs were reviewed for fracture pattern, tip-apex distance (TAD), Parker’s ratio (PR), and reduction quality. Rate of implant cut-out was compared between groups and multiple logistic regression was used to analyze the ability of several independent variables to predict implant cut-out.

Results: 20 cut-outs occurred: 15 with helical blades and 5 with lag screws. No difference in the rate of cut-out was observed between the 2 groups (P = 0.45). Poor fracture reduction was found to be a significant predictor of implant failure via bivariate and multiple logistic regression analysis (P <0.01, odds ratio [OR] 23.573). Helical blade fixation, fracture instability, TAD ≥25, and PR ≥0.45 were not predictive of implant cut-out during multivariate analysis. Similarly, patient smoking status and surgeon trauma fellowship training did not significantly increase the odds of implant cut-out. Failure by medial perforation occurred in 12 instances, all involving helical blades. Failure by superior migration occurred at a significantly higher rate with lag screws than helical blades (P = 0.02).

Conclusion: CMN cutout is likely multifactorial. A direct association between helical blade fixation and implant cut-out was not observed in our study. Among modifiable risk factors for implant failure, poorer fracture reduction was predictive of failure by cut-out. Subgroup analysis highlights differing modes of failure between lag screws and helical blades that warrants further investigation. Ideal TAD during helical blade fixation remains unknown.

See the meeting app for complete listing of authors’ disclosure information.