

Impact of Increasing Fracture Comminution and Severity on Achieving Optimal Femoral Version: An Analysis of 307 Intramedullary Femoral Nails

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Purpose: Intramedullary (IM) nailing for femoral shaft fractures has become standard of care. Complications include malrotation and malalignment, and degree of comminution and severity of injury has the potential to adversely affect proper alignment and version following IM nailing. The objective of this study was to analyze the impact of increasing injury severity and comminution and the ability to obtain proper version following IM nailing of femoral shaft fractures.

Methods: 417 consecutive patients with femur fractures were treated with an IM nail at a Level I trauma and tertiary referral center. Of these, 307 with CT scanograms with the ability to calculate femoral version were included in this study. Univariate and multivariate regression statistical models were utilized to identify any predictors of malrotation in regards to AO/OTA and/or Winquist classification.

Results: Fractures were classified by an orthopaedic trauma fellowship-trained attending surgeon. AO type A fractures were the most common (51.5%), followed by type B (30.0%) and type C (18.5%). When categorized according to the Winquist system, 49.5% were type 1, 14.7% were type 2, 21.2% were type 3, and 14.7% were type 4. In univariate analysis, none of the classification systems were predictive of postoperative distal femoral version. Subsequently, multivariate models did not yield any significant predictors.

Conclusion: Increasing degree of comminution and injury severity had no significant impact on obtaining acceptable femoral version following IM nailing. Controlling for several factors via univariate and multivariate models yielded similar results.