

Does Increasing Fracture Comminution Affect Version After Intramedullary Nailing of Femoral Shaft Fractures?

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Purpose: Intramedullary (IM) nailing has become the standard of care for the treatment of most femoral shaft fractures. Complications in fracture healing such as malrotation and malreduction may be a consequence of the energy imparted on the femur and subsequently the degree of comminution of the fracture. The objective of this study was to analyze the relationship between the degree of comminution and the ability to obtain acceptable femoral version following IM nailing of femoral shaft fractures.

Methods: Between 2000 and 2009, 417 consecutive patients with femur fractures were treated with an IM nail at a Level I trauma and tertiary referral center. Of these patients, 307 met inclusion criteria and obtained postoperative CT scanograms to calculate femoral version and were thus included in the study. In this study, our main outcome measure was the difference in femoral version (DFV) between the uninjured limb and the injured limb. Femoral version was determined on postoperative CT scanograms and reviewed by a musculoskeletally trained radiologist and the senior, trauma fellowship-trained orthopaedic surgeon.

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 had no significant impact on obtaining acceptable femoral version following IM nailing. Controlling for several factors via univariate and multivariate models yielded similar results. With current nailing systems and techniques taught and studied in the US, appropriate DFV can be obtained even in the most highly comminuted fracture patterns.