

Evaluating and Correcting for Rotational Deformity During Retrograde Femoral Intramedullary Nailing

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Purpose: The standard of care for the majority of femoral shaft fractures is locked intramedullary nailing. Retrograde insertion offers advantages in a number of clinical circumstances over antegrade methods; however, malrotation remains a common complication. Our novel technique describes a workflow for assessing and correcting rotational deformity during retrograde femoral nailing.

Methods: This technique uses the proximal and distal interlock holes that are offset 90° as reference points for matching rotational alignment to the uninjured side. In addition, we use a perfect lateral of the knee and a hip image 90° from this view to assess rotation. The injured extremity undergoes standard retrograde intramedullary nailing. When the same hip image is obtained on the injured side, the nail is rotated to have superimposed perfect circles and then the nail is locked proximally. When returning to the knee for a lateral image, a perfect lateral and matching perfect circles in the same view will indicate correct rotational alignment. Finally, the nail is locked distally. Rotation is assessed clinically and with CT of the bilateral femurs to evaluate femoral version.

Results: We provide several example cases that demonstrate the success of this technique. The mean rotational difference between injured and uninjured extremities was 1.4°.

Conclusion: We describe a novel technique that uses the orientation of the locking holes to efficiently assess and correct malrotation during retrograde intramedullary nailing of femoral shaft fractures.