

Radiation During Antegrade Nailing of Femur Fractures Reduced by Distal Targeting Arm: A Prospective Randomized Controlled Trial

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Purpose: Placing distal interlocking screws during femur intramedullary nailing can involve considerable radiation exposure for the patient and operating team. We performed a randomized trial on the use of a distal targeting arm (Targeter) to place the distal interlocking screws in antegrade femoral nails to determine the effect on fluoroscopy use and time compared to a perfect circle (Circle) technique.

Methods: This study occurred at a large, urban, Level I trauma center. All devices and techniques had prior US Food and Drug Administration approval. Inclusion criteria were patients ≥ 18 years old with an acute femur fracture (OTA/AO 31A or 32) treated with an antegrade intramedullary nail. Patients were block-randomized to Circle or Targeter. An independent observer recorded elapsed time and number of images for each screw. Mann-Whitney U tests were used for analysis.

Results: 11 patients were randomized to Targeter and 16 to Circle. The Targeter group used significantly fewer radiographic images (median 13.0 vs 23.0) for the first screw with no difference in time (median 6.4 min vs 7.6 min) (Figure).

Conclusion: In this prospective randomized controlled trial, a distal targeting arm reduced the number of fluoroscopy images for the first distal interlocking screw during antegrade femoral nailing with no difference in time. This radiation reduction could add up substantially throughout a surgeon’s career.

Figure - Distal targeting arm reduces the number of images to place first screw in antegrade femur nail with no change in time

