



Study of clinical outcome of distal third femur fractures treated with retrograde intramedullary interlocking nail

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Abstract

Background: Distal femur fractures, including supracondylar and distal third femoral fractures, account for approximately 3–7% of all femoral fractures and are associated with significant morbidity due to complex anatomy and biomechanical challenges. Retrograde intramedullary interlocking nailing has emerged as an effective treatment modality offering stable fixation with minimal soft tissue disruption.

Aim: To evaluate the clinical, functional, and radiological outcomes of supracondylar and distal third femur fractures treated with retrograde intramedullary interlocking nail using Neer's criteria, and to assess postoperative rehabilitation outcomes.

Materials and Methods: This prospective study was conducted at Karnataka Institute of Medical Sciences between September 2024 and September 2025. A total of 25 patients with closed supracondylar and distal third femur fractures above 18 years of age were included. All patients underwent closed reduction and internal fixation using retrograde intramedullary interlocking nail. Functional and radiological outcomes were assessed using Neer's criteria during follow-up.

Results: The mean age of patients was 42 years, with males constituting 80% of cases. Road traffic accidents were the most common mode of injury (72%). According to AO classification, type 33A2 fractures were most common (64%). Functional outcomes based on Neer's criteria were excellent in 52% of patients, good in 36%, fair in 8%, and poor in 4%. Mean duration of surgery was 82 minutes with average blood loss of 256 ml. All fractures achieved union, with average union time of 4.5 months. Dynamisation was required in 16% of cases. Most patients achieved satisfactory knee range of motion, with minimal complications.

Conclusion: Retrograde intramedullary interlocking nailing is an effective and reliable method for management of supracondylar and distal third femur fractures. It provides stable fixation, early mobilization, satisfactory functional recovery, and good radiological union with minimal soft tissue disruption and acceptable complication rates.

Keywords: Distal femur fracture, supracondylar femur fracture, retrograde intramedullary interlocking nail, retrograde femoral nailing, distal third femur fracture, intramedullary fixation, functional outcome, Neer's criteria, femoral fracture management, orthopaedic trauma surgery

Introduction

Distal femur fractures are very common fractures accounting for about 3%-7% of femur fractures. If hip fractures and excluded 1/3rd of femur fractures involve the distal femur. Shows bimodal age distribution. Distal femur has complex anatomy; it broadens from a cylindrical shaft, medial condyle is more distal and more curved than lateral condyle, and femoral shaft aligns in the anterior half of the condyles.

Aim of the Study

To assess the clinical outcome including functional and radiological outcome of supracondylar and distal third femur fractures treated with retrograde intramedullary interlocking nail by NEER'S CRITERIA. To study the post-operative rehabilitation of retrograde nailing in supracondylar and distal third femur fractures.

Discussion

Fractures of distal femur remain a surgical challenge. Distal femur has a trumpet shape; if stressed, the nail may slip within the bone. Retrograde nail provides better fixation because of its longer functional length, better purchase/adherence at both ends. 16% of our cases needed dynamisation to achieve union. Most common complaint post-operatively was knee pain and knee stiffness. Most common difficulty was proximal locking (either by zig or by free hand) or valgus malalignment at the fracture site.

Conclusion

Good technique for stabilisation of distal femur fractures provides good anchorage to bone where there is difficulty because of wide canal, thin cortices. Retrograde nail procedure provides pain less, with good functional outcome, with good knee range of motion, and patient can go back to his work without decreasing his work capacity; hence we recommend retrograde nailing procedure for all distal third femur fractures.



Fig 1: PreOp X Ray Thigh with Knee Ap (A) And Lateral View (B)



Fig 2: 1year Clinical Image Describing Range of Motion.



Fig 3: 1 Year Post X Ray Thigh with Knee Ap (A) And Lateral View (B)

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