

Case Report

Miss-A-Nail Technique for Neck of Femur Fracture – A Case Report

Nandini Sanjay¹, Arun HS^{2*}

1. Resident, Department of Orthopaedics, Sri Devaraj Urs Medical College, Sri Devaraj Urs Academy of Higher Education and Research, Tamaka, Kolar.
2. Professor & HOD, Department of Orthopaedics, Sri Devaraj Urs Medical College, Sri Devaraj Urs Academy of Higher Education and Research, Tamaka, Kolar.

Abstract

Femur shaft fractures are common fractures that orthopaedic surgeons come across. Such fractures frequently associate with high energy trauma (ex: Motor vehicle accident, fall from height) in young patients or a trivial fall in elderly patients. IMIL nailing is the most frequently used modality of management for shaft of femur fractures. Early definitive treatment within 24-48 hours in stable patients reduces the risk of mortality and morbidity. Fracture of femoral neck is an unusual complication while performing IMIL shaft fracture. We present a case of iatrogenic fracture neck of femur while performing IMIL for fracture shaft of femur and the technique of fixation used for the same intra-operatively.

Keywords: Miss-A-Nail, Femoral neck, Fracture, Iatrogenic, Intramedullary, Nailing.

Introduction

Locked intramedullary nailing (IMIL) is the standard choice of treatment for isolated femoral shaft fractures.¹ Ipsilateral neck of femur fractures are an unusual complication following IMIL nailing of femoral shaft fractures most commonly occurring due to technical difficulties. The intra-operative treatment of such fractures is done by placement of compression screws into head of femur around proximal end of nail, known as the “Miss-a-nail” technique. We present a case report of the same.

Case History

36Y/F presented to the emergency department of R.L. Jalappa Hospital after sustaining a fall from height following which she sustained injury to her left thigh. Patient presented with symptoms of fat embolism syndrome with low oxygen saturation (82%) at room air, and hypotension. Patient was treated initially with conservative management and

splinted using thomas splint. Radiographs showed a fracture in the left femur shaft with ipsilateral patella fracture (Figure 1 and 2).

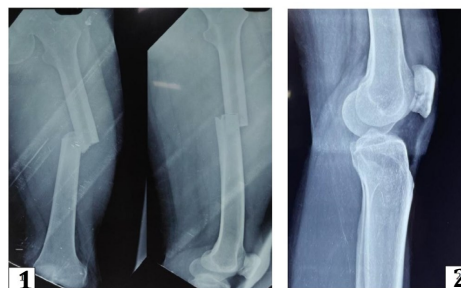


Figure 1: Anteroposterior and Lateral radiographs of left thigh showing fracture shaft of left femur.

Figure 2: Lateral radiograph of left knee showing fracture of left patella.

Once patient was stabilized, she was prepped for the proposed procedure. Intra-operatively, patient was placed on fracture table after spinal anesthesia and fracture was reduced manually. A 5 cm incision was given approximately 10 cm above greater trochanter and entry point was identified medial to greater trochanter. Bone awl was inserted and guide wire passed. The canal was reamed using serial reamers and appropriate size femoral IMIL nail was inserted after fracture reduction. During insertion of proximal screw, fracture of femoral neck was identified and fixed with two 6.5mm cannulated

*Corresponding Author

Dr. Arun H S

Professor & HOD, Department of Orthopaedics, Sri Devaraj Urs Medical College, Sri Devaraj Urs Academy of Higher Education and Research, Tamaka, Kolar.

Mobile No: 9945684667

E-mail: drarunhs5@gmail.com

Conflict of Interest: None

Financial Aid: Nil

cancellous screws using Miss-a-nail technique. Distal screws were then put using free hand technique under C-arm guidance. Wound was closed in layers. Adequate fracture reduction of femur shaft and neck was obtained and confirmed under C-arm. Following which, patella fracture was stabilised with K wires and tension band wiring. Post-operatively, patient was strictly advised to follow non-weight bearing mobilization with walker for 2 months. Post-op radiographs confirmed adequate reduction (Figure 3 and 4). Serial follow up X-rays were done which showed uniting fracture of femur shaft, neck and patella. No evidence showing AVN of femoral head was noted on follow up X-rays. After 2 months, patient was advised to follow weight bearing mobilization with the help of a walking cane and to continue knee and hip strengthening exercises. Patient is symptomatically better and has minimal pain over the operated limb.

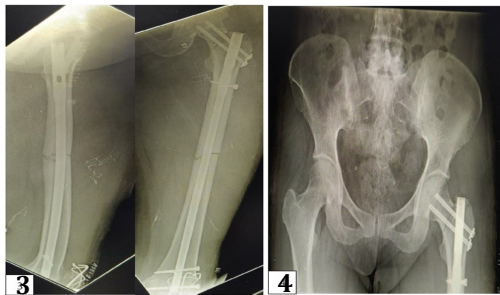


Figure 3: Anteroposterior and Lateral radiographs of left thigh showing reduced fracture shaft of left femur with intramedullary interlocking (IMIL) nail and 2 cannulated cancellous (CC) screws in situ.

Figure 4: Anteroposterior radiograph of pelvis showing fracture neck of left femur with 2 CC screws in situ.

Discussion

Early closed intramedullary nailing using locking bolts to enhance stabilization is now preferred method of management for femur shaft fractures in adults.² This procedure requires experience, and patients with femoral neck fractures after IMIL nailing are described by several authors.³ Treatment of isolated femur neck fractures are often performed with open or closed reduction with cannulated cancellous screw fixation.⁴ With an antegrade femoral nail in situ, it complicates the fixation of neck of femur fracture. One option includes removing the previous implant prior to inserting the screws for the neck fractures. However, removing the implant may cause iatrogenic fractures, increase intra-operative time and difficulty in re-inserting the nail following screw fixation for the neck.⁵ The other option includes fixation of the neck fracture by inserting cancellous

screws with the antegrade nail insitu. This is done by using the Miss-a-nail technique.⁶ The reasons for an iatrogenic neck fracture during femoral nail include The forceful use of an awl in wrong direction, multiple entry points in greater trochanter may weaken neck of femur such that subsequent insertion of the nail completes the fracture and hammering of the nail insertion jig.³ Khan et al conducted a study wherein authors observed good functional outcomes in patients who sustained iatrogenic neck fractures while IMIL nailing of femoral shaft fractures, that were treated conservatively.⁷ Various factors influence healing process of neck fractures and management depends of the surgeon's preference. Neck fractures, if treated improperly often lead to avascular necrosis of femoral head, non-union, coxa vara, secondary osteoarthritis of the hip joint, financial burden and disability.⁸

We conclude that surgeons must be aware of the intra-op complications of femoral shaft fractures during nailing, the most important being neck of femur fracture and miss-a nail technique is appropriate way of fixation of such fractures with intramedullary nail in situ.

References

1. Rudloff MI, Smith WR. Intramedullary nailing of the femur: current concepts concerning reaming. *J Orthop Trauma* 2009; 23(5):S12-7.
2. Christie J, Court-Brown C, Kinninmonth AW, Howie CR. Intramedullary locking nails in the management of femoral shaft fractures. *J Bone Joint Surg Br* 1988;70(2):206-10.
3. Grala P, Mańkowski B, Kierzyńska G. Femoral neck fracture following intramedullary nailing with misplacement of an end cup: report of two cases. *J Orthopaed Traumatol* 2009; 10(1):35-8.
4. Yang KH, Choi YW, Won JH, Yoo JH. Subcapital femoral neck fracture after removal of Gamma/Proximal Femoral nails: report of two cases. *Injury Extra* 2005; 36(7): 245-8.
5. Kow RY, Abdul-Aziz A, Low CL. Miss-A-Nail Technique for Neck of Femur Screw Fixation: It Is Easier Said Than Done. *Malays Orthop J* 2020; 14(1):96-97.
6. Wheelless CR. Miss A Nail Technique: (Special Aiming Arm). North Carolina: Wheelless' Textbook of Orthopaedic; 2012. Available from: <https://www.wheelsonline.com/joints/miss-a-nail-technique-special-aiming-arm> (Assessed 5 March 2022).
7. Khan FA, Ikram MA, Badr AA, al-Khawashki H. Femoral neck fracture: a complication of femoral nailing. *Injury* 1995; 26(5):319-21.
8. Dedrick DK, Mackenzie JR, Burney RE. Complications of femoral neck fracture in young adults. *J Trauma* 1986; 26(10):932-7.