

Assessment Of Outcome Of Retrograde Nailing In Distal 1/3rd Fracture Shaft Femur

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ABSTRACT

Background: The distal third femoral fractures comprise 6% of all femoral fractures. The present study was conducted to assess outcome of retrograde nailing in distal 1/3rd fracture shaft femur.

Materials & Methods: 78 patients of distal 1/3rd fracture shaft femur of both genders were treated with retrograde nailing. Parameters such as mode of injury, type of fracture, mean time from the injury, mean duration of the surgery, mean time of the fracture healing, post-operative knee range of motion (ROM) etc. was recorded.

Results: Out of 78 patients, males were 48 and females were 30. Mode of injury was RTA in 41, fall in 10 and domestic violence in 7. Types of fracture was compound in 10, closed in 18, isolated femoral in 26 and polytrauma in 4. The difference was significant ($P < 0.05$). The mean time from the injury was 3.5 days, mean duration of the surgery was 94.2 minutes, mean time of the fracture healing was 18.2 weeks and post-operative knee range of motion (ROM) was 132.5 degree.

Conclusion: Retrograde nailing is a reliable alternative in the management of selected complicated fractures of the distal femoral shaft.

Keywords: distal femoral shaft, Retrograde nailing, union

Introduction

The distal third femoral fractures comprise 6% of all femoral fractures. These fractures occur in bi-modal distribution as high energy trauma in younger age group and low energy fractures due to osteoporosis in the elder age group. Due to extensive comminution, soft tissue damage, an extension of the fracture into the knee joint, neurovascular damage and injury to the extensor mechanism in the distal femur, these distal third femoral injuries were complicated and uneasy to manage.

The goals of treatment follow AO principles of anatomic reduction of the articular surface,

restoration of limb alignment, length, and rotation. Despite improvements in implant design, management of distal femur fractures remains a challenge; fractures are often comminuted, intra-articular, and involve osteoporotic bone, making fixation challenging to achieve. In the geriatric trauma population, the incidence of co-morbidities is high and may impact the therapeutic options.

Retrograde nailing is a viable option for the treatment of distal femur fractures. The advantages of retrograde nailing include: the intramedullary nail is a load-sharing device compared to plate fixation, the nail may be

inserted through smaller incisions causing less soft tissue disruption, and it allows for the treatment of ipsilateral hip and ipsilateral tibia fractures in the polytrauma patient. Retrograde nails of standard-length should extend to the level of the lesser trochanter to prevent a stress riser in the subtrochanteric region. Newer implants with options for multiple distal screw fixation allow for the restoration of the articular surface for simple intra-articular fractures. The present study was conducted to assess outcome of retrograde nailing in distal 1/3rd fracture shaft femur.

Materials & Methods

The present study comprised of 78 patients of distal 1/3rd fracture shaft femur of both genders. All gave their written consent for the participation in the study.

Data such as name, age, gender etc. was recorded. All cases were treated with retrograde nailing. Parameters such as mode of injury, type of fracture, mean time from the injury, mean duration of the surgery, mean time of the fracture healing, post-operative knee range of motion (ROM) etc. was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 78		
Gender	Males	Females
Number	48	30

Table I shows that out of 78 patients, males were 48 and females were 30.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Mode of injury	RTA	41	0.02
	Fall	10	
	Domestic violence	7	
Types of fracture	Compound	10	0.05
	Closed	18	
	Isolated femoral	26	
	Polytrauma	4	

Table II, graph I shows that mode of injury was RTA in 41, fall in 10 and domestic violence in 7. Types of fracture was compound in 10, closed in 18, isolated femoral in 26 and

polytrauma in 4. The difference was significant (P< 0.05).

Graph I Assessment of parameters

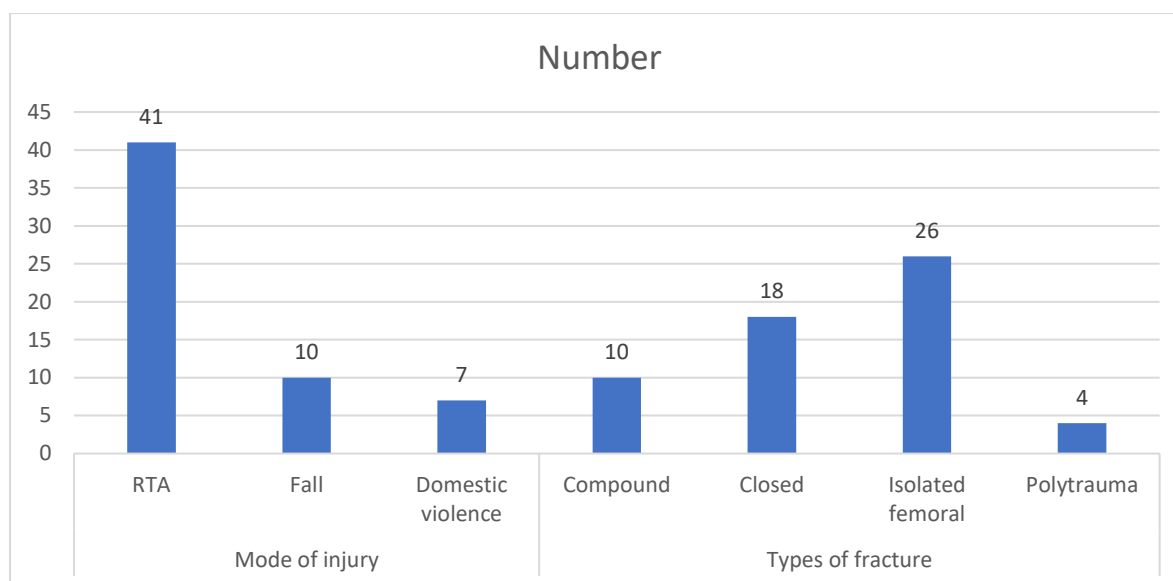


Table III Assessment of clinical characteristics

Parameters	Mean	SD
Mean time from the injury	3.5 days	1.1
Mean duration of the surgery	94.2 minutes	15.2
Mean time of the fracture healing	18.2 weeks	7.4
Post-operative knee range of motion (ROM)	132.5 degree	19.7

Table III shows that mean time from the injury was 3.5 days, mean duration of the surgery was 94.2 minutes, mean time of the fracture healing was 18.2 weeks and post-operative knee range of motion (ROM) was 132.5 degree.

Discussion

The distal third femoral fractures comprise approximately 3%-6% of all femoral fractures.⁷ The mechanism of injury associated with distal third femoral fractures may be of high energy mechanisms such as motor vehicle accidents which are more common in the younger adults as compared with low energy mechanisms such as fall from a stand in the elderly.⁸ Distal third femoral fractures are associated with more complex soft tissue injuries and thus challenge every orthopedic surgeon to achieve and maintain an adequate reduction and overall limb alignment.⁹ The present study was conducted to assess outcome of retrograde nailing in distal 1/3rd fracture shaft femur.

We found that out of 78 patients, males were 48 and females were 30. D Shekhareswar et al¹⁰ found that out of 20 study subjects, there were 7 patients (35%) in the age group of 31-40 years followed by 6 patients (30%) were in the age group of 31-40 years, 4 patients (20%) were in the age group of 41-50 years, 2 patients (10%) in the age group of 51-60 years with mean age of the patients was 43.6 ± 17.67 years. There were 17 patients (85%) male and 3 patients (15%) female. The mode of injury in case of majority of the patients had RTA [road traffic accidents] 11 patients (55%), followed by fall from height 5 patients (25%), sports injury 2 patients (10%) and domestic injuries 2 patients (10%). Mean time from the injury to operation was 3 days. The mean duration of the surgery was 100 mins. Majority of the patients 16 (80%) had isolated femoral fractures while others 4 patients (20%) had polytrauma. Mean time of the fracture healing was 18.5 weeks [SD ± 6.75]. In the present study we have observed that the post-operative knee range of motion

(ROM) achieved; 8 patients (40%) had 125°, 4 patients (20%) had 135°, 2 patients (10%) had 140°, 2 patients (10%) had 105°, 3 patients (10%) had 110°, 1 patient (5%) had 115°, and with mean of 123.75° post-operatively.

We found that mode of injury was RTA in 41, fall in 10 and domestic violence in 7. Types of fracture was compound in 10, closed in 18, isolated femoral in 26 and polytrauma in 4. Hierholzer C et al¹¹ revealed that clinical and radiographic evaluation demonstrated osseous healing within 6 months following retrograde intramedullary (IM) nailing (RN) and less invasive stabilization on system (LISS) plating in over 90% (n=104) of patients. Time to healing was not significantly different between the groups. In the RN group 5 out of 59 patients (9%) developed non-union as no bony consolidation of the femoral fracture was observed 6 months after osteosynthesis. In the LISS group, non-union was observed in 6 out of 56 patients (12%). There was no statistically significant difference between the two groups for the development of non-union. However, no statistically significant differences between the nail and the LISS group were found for the parameters time to osseous healing, rate of non-union, and postoperative complications. Radiographic signs of healing correlated with clinical signs of healing, including the absence of pain or tenderness over the fracture site and the absence of pain with motion. The additional secondary bone grafting or bone substitute (BMP) was required, 3 months after the primary operation in four patients (7%) in RN group and six (12%) in LISS group.

We found that mean time from the injury was 3.5 days, mean duration of the surgery was 94.2 minutes, mean time of the fracture healing was 18.2 weeks and post-operative knee range of motion (ROM) was 132.5 degree. Nagla A et al¹² observed that mean age of patients was 35.8 years (18 years to 62 years) where 87.5% were male and 12.5% were female. Average duration of healing was 17.75 weeks (ranging from 10 weeks to 36 weeks) with 100% healing achieved. Mean knee range of motion was

124.5 degree (70 to 140 degree), rate of knee pain 10% (4/40), re-operation rate 5% (2/40), infection rate 2.5% (1/40), and fat embolism 2.5% (1/40).

The limitation the study is small sample size.

Conclusion

Authors found that retrograde nailing is a reliable alternative in the management of selected complicated fractures of the distal femoral shaft.

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