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Outcome analysis in ipsilateral fractures of hip and shaft of femur fracture treated by intramedullary reconstruction nail

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Abstract

Background: This prospective study was conducted to evaluate the functional outcome of reconstruction nail in patients with ipsilateral fractures of hip and shaft.

Methods: The study was conducted prospectively on patients admitted with concomitant fractures of ipsilateral hip and shaft of femur. All data were analyzed by SPPS software.

Results: Mean time for union at fracture neck of femur was 15.21 ±4.41weeks. Mean time for union at trochanteric fracture site was 14.12 ± 2.51 weeks. Mean time of union for shaft of femur was 26.32 ± 8.18 weeks.

Conclusion: Reconstruction nail is a very good implant choice to fix both the fractures simultaneously with minimal soft tissue damage and providing biological fixation for both the fracture combination.

Keywords: Rconstruction, Malunion, Implant

Introduction

Fractures of ipsilateral hip and shaft of femur is an uncommon and complex pattern of injury. This combination of fractures usually occur in young individuals with history of high energy trauma like road traffic accidents and fall from height. Alho A reported road traffic accidents as a cause in 78% and other high velocity injuries in 13% of cases in his study.[1]

A wide range of treatment methods have been tried for this combination injury and until now no method can be considered absolutely superior to any other.[2]

Reconstruction interlocking nails (recon nails) have many technical requirements but they have gradually become increasingly popular for the treatment of ipsilateral hip and femoral shaft fractures worldwide.[3]

The use of recon nails have advantages of being less invasive, ease of application and decreased surgical time and blood loss. Success rates of this procedure have been reported to be 69-100%.[4]

This prospective study was conducted to evaluate the functional outcome of reconstruction nail in patients with ipsilateral fractures of hip and shaft.

Material And Methods

The study was conducted prospectively on patients admitted with concomitant fractures of ipsilateral hip and shaft of femur.

Inclusion Criteria

1. Patients with ipsilateral fractures of hip and shaft of femur.
2. Patients of either sex aged between 18 to 75 yrs.
3. Patients consented to be included in the study.

Exclusion Criteria

1. Medically and anaesthetically unfit patients.
2. Patients with associated vascular injuries.
3. Patients with associated acetabular and extensive pelvic fractures.
4. Patients with fractures in paralytic or poliotic limb
5. Patients with pathological fractures.
6. Patients not consented to be included in study.

Data Analysis: Data was recorded as per Performa. The data analysis was computer based; SPSS-22 was used for analysis. For categoric variables chi-square test was used. For continuous variables independent samples's *t*-test was used. *p*-value <0.05 was considered as significant.

Observations and Results

Table 1: Demographic profile

Mean age	35.26±12.96 yrs
Male : Female	41:4

Youngest patient in our study was 18 years old and oldest patient was 65 years old. Mean age was 35.26 years. Maximum patients were male.

Table 2: Time of union (weeks)

Fracture site	Mean	SD
Fracture neck of femur	15.21	4.41
Fracture I/T femur	14.12	2.46
Fracture shaft of femur	26.32	8.01

Mean time for union at fracture neck of femur was 15.21 ±4.41weeks. Mean time for union at trochanteric fracture site was 14.12 ± 2.51 weeks. Mean time of union for shaft of femur was 26.32 ± 8.18 weeks.

Table 3: Final Outcome

Functional outcome	Number of Cases	Percentage (%)
Excellent	24	53.33
Good	12	26.67
Fair	4	8.88
Poor	4	8.88
Total	45	100.00

Twenty three patients out of 45 had excellent results on the basis of harris hip score. 24 patients had excellent, 12patients had good, 4 patients had fair and 4 patients had poor functional outcome.

Table 4: Complications

Complication	Number of Cases	Percentage (%) (N=45)
Delayed Union		
Fracture neck of femur	5	11.11
Shaft of femur fracture	8	17.78
Nonunion		
Shaft of femur fracture	5	11.11
Fat embolism		
Present	1	2.22
Shortening		
<2 cm	3	6.66
2-3 cm	6	13.33
z effect or reverse z effect	1	2.22
Superficial infection	3	6.66
Malunion		
Trochanteric fracture	7	15.55
Fracture neck of femur	3	6.66
Shaft of femur fracture	4	8.88

Out of 13 patients who had delayed union, 8 patients had delayed union of shaft and 5 had delay in union of neck fracture. In 5 patients shaft of femur fracture failed to unite requiring further intervention. One patient developed fat embolism preoperatively, managed in intensive care unit. 9 patients had shortening, 3 had shortening <2cm and 6 patients had shortening between 2-3cm. One patient developed reverse Z-effect. 3 patients developed superficial infection. Malunion was seen in 14 patients, out of which 7 were trochanteric fracture ,3 were neck of femur fracture and 4 were shaft fracture.

Discussion

Mean time for union at fracture neck of femur was 15.21 ±4.41weeks. Mean time for union at trochanteric fracture site was 14.12 ± 2.51 weeks. Mean time of union for shaft of femur was 26.32 ± 8.18 weeks. Our results were comparable to the studies of Wang(2010)[5], Vidyadhara(2009)[5],Roop singh(2008)[7],Krishna et al(2017)[8] and Jain et al(2004)[4]. While different authors have reported different union time for these fractures in their study.

Delayed union in our study was observed in 9 patients with shaft of femur and in four patients with neck of femur. Five patients experienced non-union of shaft of femur. Three patients were Winquist type 4, one of type 3 and another one belong to type 2 fracture shaft of femur. One of these was infected non-union at shaft of femur, which was debrided and healed with intravenous antibiotics. Another patient who had hypertrophic non-union, exchange nailing with bone graft was done for the patient. While simple bonegraft was done for the remaining 3 patients, two of them are still to unite. All fractures at neck and trochanteric region united.

Shortening of 2-3 cm was seen in six of our patients and less than 2 cm of shortening in three of our patients. One of our case was complicated with Reverse Z-effect of proximal locking, in whom the loose screw was removed and bone graft was done. Three of our cases were complicated by superficial infection of the incision site, who were treated with debridement and intravenous antibiotics. One of our patient developed fat embolism in preoperative period and was managed in ICU for 10 days.

Malunion at fracture neck of femur was seen in 3 patients. In patients with trochanteric fracture, malunion was observed in 7 patients and in shaft of femur in four patients.

We did not have any cases of avascular necrosis of head of femur in our study.

Mean Harris Hip Score, in our study was 85.93, ranging from minimum of 47 to maximum of 97. Similar results were observed by Tsarouhas A. et al (2011) in their study.

Thirty seven patients (82%) out of 45 patients included in our study had excellent to good results. While 4 patients had fair results. Four patients experienced poor functional outcome.

Conclusion

Reconstruction nail is a very good implant choice to fix both the fractures simultaneously with minimal soft tissue damage and providing biological fixation for both the fracture combination.

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