



AN OBSERVATIONAL STUDY - TREATMENT OF INTERTROCHANTERIC FEMUR FRACTURES BY PROXIMAL FEMORAL NAIL

Orthopaedics

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ABSTRACT

INTRODUCTION: Intertrochanteric fracture is one of the most common fractures of the hip especially in the elderly with osteoporotic bones, usually due to low-energy trauma like simple falls. The present study was undertaken to assess outcome of 30 patients of intertrochanteric fractures treated with proximal femoral nail.

MATERIAL AND METHODS: 30 cases of intertrochanteric fractures in adults treated by proximal femoral nail were studied. Results assessed by Harris Hip Score at the end of 12 weeks. Maximum age was 87 years and minimum age was 34 years. 12 patients were male and 18 were female.

RESULT: Most common type of intertrochanteric fracture was AO type 31A3. Average time for union was 12.75 weeks. 84 % excellent and good results were obtained among all cases as per Harris grade. One patient had post-operative complications of superficial wound infection and one patient had implant failure.

CONCLUSION: Results of the study concluded that the functional outcome of unstable intertrochanteric femur fractures treated with proximal femoral nail were similar to stable fractures. In addition, the PFN requires shorter operative time and a smaller incision, it has distinct advantages in the treatment of intertrochanteric fractures.

KEYWORDS

INTRODUCTION

Proximal femoral fractures are a big challenge in traumatology both for orthopaedic surgeons and anaesthetists. These fractures are relatively common in the elderly in 5th decade of life due to decreasing bone stock, leading to fracture by trivial trauma¹. The younger age group is getting involved because of high energy trauma and rapid industrialization².

The proximal femoral fractures are 2 to 3 times more common in females than in males. Around 50% of the hip fractures in the elderly are intertrochanteric fractures and half of which are unstable. With increasing age and low bone mineral density unstable fractures are common³.

Intertrochanteric femur fractures were mostly subjected to conservative treatment in the past which led to a number of morbidities like external rotation deformity, malunion with varus, short limb gait and a substantial rate of mortality due to problems of recumbence and delayed mobilization, and DVT.

The internal fixation of intertrochanteric fractures became popular for early restoration of the patient to their pre-injury status⁴.

Instability and fixation failures are a big challenge for the orthopedic surgeon. Benefits of surgery and complications of fixation depends a great deal on the choice of implant. Various sliding devices (example dynamic hip screw) used for fixing intertrochanteric femur fractures have high failure rates, typically in comminuted fractures.

Such fractures have benefited from the use of intramedullary devices like the pfn. Because of their placement near the mechanical axis of the limb they decrease the lever arm as well as the bending movement on the implant. Intramedullary devices are also superior because there is minimal blood loss, early weight bearing and limb shortening is rarely reported.

MATERIAL AND METHODS

A study was conducted on 30 adult patients (both male and female above the age of 18 years) with Intertrochanteric femoral fractures in the Department of Orthopaedics, MMIMSR during a study period of 2 years.

RESULTS

In our study maximum number of patients (27%) were from 51-60 year age group followed by 41-50 year group with 23% of the total patients. The mean age of the patients was 60.8 years.

In the current study trivial fall was the most common mode of injury with 20 patients (67%) suffering from intertrochanteric fractures after a trivial fall out of which 14 were female and 33% cases were of road traffic accident with 6 males.

Mode of injury	Number	Percentage
RTA	10	33.33
Trivial Fall	20	66.67
Total	30	100.0

In the current study majority of the fractures (59%) united by 12th postoperative week, one fracture had delayed union which united by 18th week. One patient who had co-morbidities like tuberculosis, diabetes mellitus and hypertension suffered from non-union and eventually ended up in implant failure.

Period for union	Number	Percentage
At 10 weeks	1	3.45
10- 12 weeks	16	55.17
12- 16 weeks	11	37.93
More than 16 weeks	1	3.45
Total	29	100.0

In the present study 20 patients (67%) had an excellent harris grade, 5 patients (17%) had a good harris grade, 4 patients (13%) had a fair harris grade and only 1 patient (3%) had a poor harris grade. Mean Harris hip score for males was 84.22 and for females 92.33.

Harris Grade	Number	Percentage
Poor(<70)	1	3.33
Fair(71-79)	4	13.33
Good(80-89)	5	16.67
Excellent(>90)	20	66.67
Total	30	100.0

DISCUSSION

The trochanter area which consists of greater trochanter and lesser trochanter representing the transitional zone between femur neck and shaft. The intertrochanteric region has abundant blood supply and osteogenic properties hence fracture union occurs more often than not. Earlier conservative treatment was given which resulted in delayed mobilization and malunion as the patients were bed ridden for long periods resulting in various morbidities like bed sores, deep vein thrombosis etc.

In the current study we aim to reduce the morbidities associated with intertrochanteric fractures by managing them with proximal femur nail (PFN) which is a minimal invasive technique.

In our study almost all patients started partial weight bearing two weeks postoperatively except those with some associated injury of the upper limb or co-morbidity which delayed partial weight bearing. Majority of the patients were full weight bearing by 12th postoperative week while all other patients were weight bearing by 20th postoperative week except for one fracture which went into implant failure and ended up in nonunion.

In the current study all fractures united except one in which the patient had several co-morbidities like diabetes mellitus, tuberculosis and ended up in nonunion and implant failure. More than 50% of the fractures united by 12th postoperative week which is similar to studies conducted by Dousa⁵ and Zhao⁶ which published average time to fracture union as 12 weeks and better than study conducted by Lonikar⁷ in which average time to fracture union was 15.56 weeks.

In the current study only four patients required blood transfusion postoperatively proving the claim that proximal femoral nailing is a minimal invasive procedure with less blood loss and soft tissue dissection.

In the present study average postop stay was approx. 8 days with wound inspection done on 2nd postoperative day than on 5th postoperative day. The average hospital stay of the patients in the study group was around 12 days which is more than the average hospital stay of patients in Zhao's series and less than Dousa's series in which the patients stayed for 8 and 20 days respectively on an average.

Comparison of mean harris hip score of various studies

Series	Mean harris hip score
Lonikar ⁷ , 2016	80.62
Wild ⁸ , 2010	83
Current series	87.4

Mean Harris Hip Score of our study came out to be 87.4 with Harris Grade of 20 patients coming excellent after 12 weeks postoperative better than studies conducted by Lonikar and Wild which had mean Harris hip score of 80.62 and 83 respectively. The current study showed that proximal femoral nailing is a safe, minimal invasive technique for the treatment of intertrochanteric femur fractures with minimal soft tissue dissection and blood loss providing adequate stability and resulting in pre-fracture functional levels in majority of the patients

CONCLUSION

The following conclusions can be drawn from the observations and analysis during the course of this study:

- Proximal femoral nail has the combined benefits of dynamic hip screw and closed intramedullary nailing as it helps in the collapse of the fracture fragments with fracture milieu left intact.
- Proximal femoral nailing is a minimally invasive procedure with less blood loss, soft tissue dissection and operative time.
- Proximal femoral nailing reduces the time of postoperative hospital stay with early mobilization.
- Postoperative pain and complications like delayed and non-union are rarely encountered with the use of proximal femoral nail.
- Proximal femoral nail is a superior implant as it has an anti-rotational screw which prevents cut out and the distal nail end is flexible thus minimizing stress concentration.
- Being an intramedullary implant chances of implant failure due to osteoporosis are remote.
- Proximal femoral nail is a key option in the treatment of

intertrochanteric femur fractures as it has a simple technique with negligible complications essential in treating these fractures which occur most commonly in the elderly population.

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