

An Observational Outcome Assessment of Management of Fracture Intertrochanteric Femur using Trochanteric Fixation Nail

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Conflict of interest: Nil

Abstract

Aim: The aim of the present study was to assess the functional outcome of intertrochanteric fractures femur managed by trochanteric fixation nail (TFN) in the elderly population.

Methods: A retrospective study of intertrochanteric fracture femur that was managed with TFN was conducted in the Department of Orthopedics Madhubani Medical College and Hospital, Madhubani, Bihar, India for one year. The study includes 50 patients.

Results: Majority of the patients belonged to 31-40 years of age and there were male predominance. The mechanism of injury in 19 patients was due to fall and 31 patients had road traffic accident. Majority of the fractures were A2.1 followed A1.3. 50% had excellent outcome, 40% had good outcome.

Conclusion: The present study concluded that TFN is a good choice in managing the intertrochanteric fractures provided proper patient selection, surgical method and proper instruments are used, and having higher bone union rate and less union time. The period of immobilization is decreased, early weight bearing and less complications makes TFN more preferable for intertrochanteric fracture fixation.

Keywords: Intertrochanteric fracture, TFN, Trochanteric fixation nailing

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Introduction

The incidence of intertrochanteric fracture has increased during recent years as life expectancy has also increased. [1-2] Population based epidemiologic studies of hip fracture in Asia have reported relatively high incidence and confirmed that the number of hip fractures are likely to increase markedly in the near future. [3-4] Various types of devices have been developed to reduce surgery time and to allow immediate mobilization because most patients with intertrochanteric fractures are elderly. [5] Currently, orthopedic surgeons use various fixation methods for intertrochanteric fractures like, intramedullary (IM) nailing or dynamic hip screws and plates. Although no implant fully satisfies all fixation requirements for these fractures, IM nailing remains popular and has been reported to produce good results. [6-7] In particular, an IM nail with two lag screws improves rotational stability and the bony purchase within the femoral head and thus, resists cut out and subsequent fixation failure. [8]

However, this design lost favor due to the Z-effect phenomenon first described by Werner-Tutschku et al., [9] and later described by several investigators. [10-11] "Fractures involving proximal end of femur through and in between both trochanters with or without extension into upper femoral shaft" are

known as intertrochanteric fractures. One of the most frequent injuries is a trochanteric fracture, which mostly affects those over the age of sixty. Women with osteoporosis are three to four times more likely to sustain an injury, with simple falls being the most frequent mechanism of injury. [12] This fracture frequently results in death for many people secondary to cardiac, pulmonary, or renal problems. Between 10 and 30 percent of patients die within a year of an intertrochanteric fracture. [13] In the past, these fractures received little attention since they occurred through the cancellous bone, which has a good blood supply, and because they healed on their own without any active therapy.

The typical outcome of conservative treatment, however, was malunion with varus and external rotation deformity, which led to a short limb gait and a high probability of mortality from complications related to immobilization and recumbence. Restoring the patient to their pre-injury status as soon as possible is the aim of treatment for an intertrochanteric fracture. As a result, these fractures were internally fixed to improve patient comfort, enhance nursing care, shorten hospital stays, and lessen the risks associated with extended recumbency. [14] Intertrochanteric fracture is one of

the most devastating injuries whose incidence increases with advancing age. [15] These patients are more limited to home ambulation and become dependent for doing their basic and instrumental activities of daily living. Fifty percent of fractures around hip in elderly patients involves trochanteric fracture that are of unstable type. They are usually complicated with associated comorbidities such as osteoporosis, diabetes, hypertension, and renal failure. In such circumstances, nonoperative treatment is mainly reserved for poor medical candidates and no ambulant patients with minimal discomfort after fracture. Today operative treatment has largely replaced conservative measures and the goal is to achieve accurate or acceptable treatment.

Anatomical and stable reduction was performed with rigid internal fixation in order to achieve early mobilization of patients and prevent complications of prolonged recumbence. Despite marked improvements in implant design, surgical technique, and patient care, intertrochanteric fractures continue to consume a substantial proportion of our healthcare resources and remain a challenge to date. [16] Complications with intertrochanteric fractures arise primarily from fixation rather than union or delayed union because the intertrochanteric area is made of cancellous bones. [17] The strength of the fracture fragment-implant assembly depends upon various factors including. [18] Bone quality, fragment geometry, reduction, implant design, and implant placement. Among all these factors, surgeon can only modify the quality of the reduction, choice of implant, and its placement. A wide variety of treatment options are available for these fractures.

The sliding hip screw device has been used for more than a decade for the treatment of these fractures, which may not be an ideal implant in all cases [19-20]

The aim of the present study was to assess the functional outcome of intertrochanteric fractures femur managed by trochanteric fixation nail (TFN) in the elderly population.

Materials and Methods

A retrospective study of intertrochanteric fracture femur that was managed with TFN was conducted in the Department of Orthopedics Madhubani Medical College and Hospital, Madhubani, Bihar, India for one year. The study includes 50 patients.

Inclusion Criteria

The study included patients with age >50 years, closed fractures, isolated intertrochanteric fracture of isolated limb and patients without co-morbidities.

Exclusion Criteria

The study excluded patients with age <50 years, open fractures, patients with co-morbidities, polytrauma patients, pathological fracture and old neglected fracture more than 3 weeks old.

Preoperative planning was done along with X-rays. After giving anesthesia, closed reduction done. Fracture fixation with TFN done by lateral approach. Guidewire and reaming were used in all operations. Post-operative follow up was done at 4, 8 and 12 weeks.

Results

Table 1: Demographic data

Age group(in years)	No. of patients	Percentage (%)
19-30	10	20
31-40	16	32
41-50	12	24
51-60	8	16
61-70	4	8
Gender		
Male	32	64
Female	18	36
Mode of Injury		
RTA	31	62
Fall	19	38

Majority of the patients belonged to 31-40 years of age and there were male predominance. The mechanism of injury in 19 patients was due to fall and 31 patients had road traffic accident.

Table 2: Number of patients classified according to the fracture pattern

Type of fracture	Number
A1.2	7
A1.3	10
A2.1	14
A2.2	10
A2.3	9

Majority of the fractures were A2.1 followed A1.3.

Table 3: No. of patients according to the modified Harris hip score (results of performance of the post-operative patients as per MHHS)

Modified Harris hip score	No. of patients	Percentage
Excellent	25	50
Good	20	40
Fair	4	8
Poor	1	2
Failed	0	0
Total	50	100

50% had excellent outcome, 40% had good outcome.

Discussion

Intertrochanteric fractures are commonly encountered by the orthopedic surgeons especially in the elderly population with osteoporotic bones. [21,22] The mechanism of trauma is mainly due to fall, road traffic accident. [23] Due to high complications with the conservative management such as joint stiffness, shortening, prolong immobilization, varus deformity, surgical management is preferred. [24] Many varieties of implants can be used in this fractures, such as plates and screws, proximal femoral nail (PFN), and trochanteric fixation nailing (TFN). Rotational stability of the proximal femoral segment was improved after the development of TFN. [25]

Majority of the patients belonged to 31-40 years of age and there were male predominance. The mechanism of injury in 19 patients was due to fall and 31 patients had road traffic accident. While managing the intertrochanteric fractures, various types of fixation devices like DHS, plating with screws, PFN, and TFN could be used. [26-28] Majority of the fractures were A2.1 followed A1.3. 50% had excellent outcome, 40% had good outcome. Properly reduced fracture along with the fixation device have less chances of implant failure. TFN has short lever arm which reduces the bending stress and thus the chances of implant failure are reduced. Also the nail fixes in the medullary cavity, thus preventing medialization of the shaft of femur and excessive sliding. TFN can be used in all types of fracture pattern including subtrochanteric extension and reverse oblique fractures. [29] The main aim while operating the intertrochanteric fracture is the proper reduction of the fracture site and proper positioning of the nail along with the screws. [30-32]

Conclusion

The present study concluded that TFN is a good choice in managing the intertrochanteric fractures provided proper patient selection, surgical method and proper instruments are used, and having higher bone union rate and less union time. The period of

immobilization is decreased, early weight bearing and less complications makes TFN more preferable for intertrochanteric fracture fixation.

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