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"Outcome of Unstable Intertrochanteric Frcture Femur Treated With Trochanteric Fixation Nail"

Orthopaedic

KEYWORDS: SWS, TFN, Unstable Intertrochanteric Fracture.

Dr. Rakesh Kumar Sharma — P.G.Resident, Dept. of Orthopaedics, S.M.S. Medical College, Jaipur. Corresponding Author

Dr. M K Yadav — Professor, Dept. of Orthopaedics, S.M.S. Medical College, Jaipur.

ABSTRACT

Purpose: Trochanteric femoral fracture is common in elderly patients. The study was conducted to assess the outcome of Trochanteric Fixation Nail (TFN) in treatment of unstable intertrochanteric fracture femur (fractures 31-A2 and 31-A3, AO/ASIF classification)

Methods: After a detailed clinical history, total 30 cases (age >50 years) with unstable intertrochanteric fracture femur were included in the study.

Results: At the 24 weeks follow-up, 83.33% of the patients had good or excellent outcomes according to Salvati and Wilson Functional Scoring System (SWS). One patient noted with non-union. One patient with osteoporosis had superior migration of the nail with varus collapse. Conclusion: The TFN is a superior implant for unstable intertrochanteric fractures in terms of operating time, surgical exposure, blood loss, and complications, especially for patients with relatively small femora.

Introduction: Trochanteric femoral fractures accounts for nearly 50% of all fractures of the proximal femure.They are three to four times more common in women who are osteoporotic. Proximal femoral fractures in elderly are usually resulting from minimal (Trivial fall) to moderate physical trauma to areas of bone significantly weakened by osteoporosis.[4] The unstable fracture (fractures 31-A2.2 to 31-A3, AO/ASIF classification)[6] can be difficult to manage, particularly in non-compliant patients with implant failure and other complications being relatively common. Various implants for treatment of intertrochanteric fractures have been reported. The open technique entailing the sliding hip screw may result in deterioration of pre-existing co morbidities in elderly patients owing to increased blood loss, soft-tissue damage, and longer rehabilitation.[8] To reduce the risk of fracture and for easy insertion, in Asian femora, Trochanteric Fixation Nail (TFN) is introduced [7].

Material and Methods: The study was conducted in orthopedic wards of SMS Medical Collage Jaipur Rajasthan India. After taking clearance from the institutional ethics committee and informed consent of the subject, cases of unstable trochanteric femoral fractures treated with Trochanteric Fixation Nail (TFN) in adults and elderly patients of both genders were taken for the study. (Between April 2015 to April 2016).

INCLUSION CRITERIA: -
Close unstable fracture intertrochanteric femur.
AO/OTA fractures 31A2.2 through 31A3.3.
Patients consenting to study.

EXCLUSION CRITERIA:-
-Compound and pathological intertrochanteric fracture.
Patients with vascular injury.
Medically or anaesthetically unfit patients.
Patient refusing consent.
After routine blood investigations, X-ray, ECG, Chest X-ray PA view, the fracture was reduced by closed method. In our study we used the standard TFN (180mm) with distal diameter of 9, 10, 11,12mm and neck shaft angle was 125-135 degrees. The Surgery and implant application was done as per standard technique.

There was no defined postoperative patient protocol, but all patients were given peri-operative antibiotics for 24 to 48 hours. Follow up was done after 2 week and then reviewed after 6 week,
16 weeks and 24 weeks. At 16 weeks and 24 weeks, functional outcome was assessed by Salvati and Wilson function score.[9]

Salvati and Wilson hip function scoring system[9]
Pain
0 = Constant and unbearable, frequent strong analgesia
2 = Constant but bearable, occasional strong analgesia
4 = Nil or little at rest, pain with activities
6 = little pain at rest, pain on activity
8 = Occasional slight pain
10 = No pain

Walking
0 = Bedridden
2 = Wheelchair
4 = Walking frame
6 = One stick, limited distances up to 400 yards
8 = One stick, long distances
10 = Unaided and unrestricted

Muscle power and motion
0 = Ankylosing and deformity
2 = Ankylosing with good functional position
4 = Poor muscle power, flexion <60◦, abduction <10◦
6 = Fair muscle power, flexion 60–90◦, abduction 10–20◦
8 = Good muscle power, flexion>90◦, abduction >20◦
10 = Normal muscle power, full range of movement

Function
0 = Bedridden
2 = House-bound
4 = Limited housework
6 = Most housework, can stop freely
8 = Very little restriction
10 = Normal activities

This score takes into account the pain, walking ability, muscle power and range of motion and the overall functional ability. The total score is 40, with outcome regarded as excellent (score>31), good (score24-31), fair (score16-24) and poor (score <16).

Results: There were 15 males and 15 females with mean age 63.33yrs. None of the patient had any associated trauma. The mean PMS and ASA[2] was 8.26 & 1.63 in our study. The most common mode of injury was trival fall (83.33%) like fall in bathroom or fall while walking. Mean operative duration was 87.43 min. Mean blood loss was 129 ml. Closed reduction was done in 23 cases out of 30 pts and open in 7 cases. Non union was seen in one case of TFN. Varus deformity was seen in 1 patient.

There were 8 cases of 31 A2.2 type, 14 cases of 31 A2.3 type, 7 cases of 31 A3.1 type and 1 case of 31 A3.3 type of unstable intertrochanteric fracture were found in the study. Mean SWS (Salvati and Wilson's

scoring system) at 16 weeks was 18.93±3.34 and Mean SWS at 24 weeks was 28.80±5.33 in the study. The functional outcome based on SWS score was Fair to Good in 53.33% of patients, and 46.67% of the patients had excellent outcomes at the 24 week follow-up according to SWS.

Table 1: Functional outcome according to Salvati and Wilson's Scoring (SWS) system.

Outcome	SWS SCORE	
	At 16 week	At 24 week
Poor	4 (13.33)	0 (0.00)
Fair	23 (76.67)	5 (16.67)
Good	3 (10.00)	11 (36.67)
Excellent	0 (0.00)	14 (46.67)
Total	**30 (100.00)**	**30 (100.00)**

Table 2: Distribution according sex & mode of injury of patients.

Mode of Injury	Male	Female	Total
Fall from Height	**1 (3.33)**	**1 (3.33)**	**2 (6.67)**
RTA	**3 (10.00)**	**0 (0.00)**	**3 (10.00)**
Trival injury	**11 (36.67)**	**14 (46.67)**	**25 (83.33)**
Total	**15 (50.00)**	**15 (50.00)**	**30 (100.00)**

Table 3: Distribution according to surgery time of subjects.

Surgery Time (In min)	Cases	
	No.	%
65-85	13	43.33
85-105	15	50.00
105-125	1	3.33
125+	1	3.33
Total	30	100.00

Discussion: Intramedullary devices have mechanical and biological advantages in treatment of unstable intertrochanteric fractures. The TFN is designed to overcome some of the difficulties encountered with earlier designs of intramedullary proximal femoral nails[4] In unstable proximal femoral fractures, control of axial telescoping and rotational stability are essential. Intramedullary implants inserted in a less-invasive manner are better tolerated by the elderly.[3]It is a biomechanically stable construct that enables early weight bearing.

In our study, intertrochanteric fracture was common due to trivial fall, age ranged between 50-70 with mean age of 63.33 years. Male and female patients were equal in number in present study. Right sided fractures were accounting for 53, 33%. In our study there was one case of fixation failure causing implant breakage which was re-operated. The gamma nail and proximal femoral nail have a proximal diameter of 17 mm, which is too large for average Indian femora, and may lead to widening of the trochanter and fractures.[5] Modification of the gamma nail by reducing its diameter and length has been performed in a Chinese population[7]

In India, the proximal femoral nail is available with a length of 240 to 250 mm. It crosses the middiaphysis of the femora (with a mean length of 400 mm) and occasionally abuts against the bowed femora of an average Indian subject.[10] This may give rise to intra-operative femoral shaft fractures and thigh pain, because the implant touches the anterior cortex of the femur.[1] The short proximal femoral nail (TFN) reduces stress concentration at the tip and the smaller distal shaft diameter may prevent femoral shaft fractures. It also acts as a buttress to prevent medialisation of the shaft and provides more efficient load transfer than does a sliding hip screw. It is a superior implant for stable and unstable intertrochanteric fractures in terms of operating time, surgical exposure, blood loss, and complication rates.

Conclusion: Ideal management of intertrochanteric and subtrochanteric fractures has been debated for several years. Several fixation modalities have been suggested to improve up the clinical outcome in these difficult fractures. The TFN is a good implant in the treatment of Intretrochantric femoral fracture. It creates a biomechanically stable construct allowing early weight bearing. It is a relatively easy procedure.

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