



TO STUDY THE MANAGEMENT OF TROCHANTRIC FRACTURES -A PROGRESSIVE STUDY

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ABSTRACT

Trochantric fracture is defined as an extracapsular fracture of neck of femur, occurring in a line between the lesser and the greater trochanter and extending to a point two inches below lesser trochanter.

Patients with trochantric fracture differ from the patients of fracture neck of femur, being more in older age, greater trauma involved in the injury and extra deformity produced as well as extra trauma involved in their surgery. Unlike intracapsular fractures, since the fracture surface is cancellous with abundant muscle tissue around, the fracture union is rule. There is no complication like avascular necrosis of femoral head, except malunion which is frequent in these fractures. Non union is very rare. If these patients survive the injury, the reported rate of union is 95% to 98%.

AIMS AND OBJECTIVES:

- To study the result of treatment of trochantric fractures with sliding hip screw and locking compression plate assembly.
- To assess the rate of complications with the use of locking compression plate attached to sliding hip screw.

MATERIAL AND METHODS: This prospective study was conducted in orthocare hospital Delhi from May 1st 2015 to may 2017.

Summary and conclusion: Keeping in view the above observations and dynamic hip screw with fixed angle locking screws would reduce the risk of DHS failure. Locking screw DHS would be particularly useful in patients with poor quality osteoporotic bone and in patients with less stable fracture configurations. Further locking plate is ideal for percutaneous insertion thus reducing the blood loss and operative time. Early weight bearing is additional advantage in elderly patients for good vocational methods.

KEYWORDS : Sieps test, betadine, Small incision cataract surgery, operative complication, extracapsular, fracture, Locking.

INTRODUCTION

Trochantric fracture is defined as an extracapsular fracture of neck of femur, occurring in a line between the lesser and the greater trochanter and extending to a point two inches below lesser trochanter.

Patients with trochantric fracture differ from the patients of fracture neck of femur, being more in older age, greater trauma involved in the injury and extra deformity produced as well as extra trauma involved in their surgery. Unlike intracapsular fractures, since the fracture surface is cancellous with abundant muscle tissue around, the fracture union is rule. There is no complication like avascular necrosis of femoral head, except malunion which is frequent in these fractures. Non union is very rare. If these patients survive the injury, the reported rate of union is 95% to 98%.

The classification of trochantric fracture has evolved from pure anatomic to present situation where the biomechanical factors are considered for classification. In order to appreciate the results, one needs to understand the fracture patterns involved. Many classifications have been proposed. Some of the systems proposed have confined themselves to a simple anatomical description of the patterns observed (Evans; Ramadier; Decoux and Lavarde). More recent, systems were designed to provide prognostic information on the prospect of achieving and maintaining reduction of the different types of fracture (Tronzo; Ender; Jensen's modification of Evans grading; Muller et al).

In present day surgical practice, it is important to know whether a fracture is stable or unstable. The answer to this question will guide the reduction technique, the type of fixation to be used, the prospective management. A good classification must provide information on the fracture's potential of being anatomically reduced, with good apposition of fragments. Also, it should be possible to tell, in the light of classification, whether a particular fracture is likely to become secondarily displaced after fixation even before the patient is allowed to bear weight.

AIMS AND OBJECTIVES:

- To study the result of treatment of trochantric fractures with sliding hip screw and locking compression plate assembly.
- To assess the rate of complications with the use of locking compression plate attached to sliding hip screw.

MATERIAL AND METHODS

This prospective study was conducted in orthocare hospital Delhi from May 1st 2015 to may 2017. All the elderly patients, above the age of 60 years in whom osteoporosis is expected, with trochantric fractures attending the emergency services in the hospital were taken up for the study. The study was carried to assess the early results of internal fixation of trochantric fractures using LCP-DHS in elderly patients. We included fractures of the trochantric region with 2 fragments (type 31-A1 in AO classification) and with multiple fragments (type 31-A2 in AO classification) and subtrochantric fractures (type 31-A3 in AO classification). Fracture could be reduced by external manoeuvre on the orthopaedic table, and fractures in patients under 60 following high energy trauma were excluded from the study.

Fifty consecutive patients were included in the study. Their average age at the time of surgery was 65.96 years (range: 60 to 81). There were 18 women and 32 men.

OBSERVATION:

The present study was conducted on 50 elderly patients aged 60 years and above with intertrochantric fractures. They were managed surgically with locking compression plate with hip screw.

The study showed that the mean age of females suffering this fracture was lower than the males. But the number of males have outnumbered females with ratio of 1.7:1.

TABLE: DISTRIBUTION OF PATIENTS IN A.O. TYPES

A.O. TYPE	A 1.1	A 1.2	A 1.3	A 2.1	A 2.2	A 2.3	A 3.1	A 3.2	A 3.3
NO. OF PATIENTS	18	2	7	14	7	0	2	0	0

In our study A1 fractures constituted 54% with majority falling in A1.1 (54%) followed by A1.3 and A1.2 (14% and 4% respectively). A2 fractures comprised about 42% of which A2.1 and A2.2 were 28% and 14% respectively. We had only persons in 4% patients in A3 group and that too of A3.1. we had no patients in A2.3, A3.2 and A3.3.

In our series we had 30% patients with grade I osteoporosis, 32% in grade II and 24% in grade III. There were 4.5% and 6% in grade IV and V respectively.

The frequency of trivial trauma producing these fractures was about 54% mainly affecting females. Out of 18 females in our study 15 females had trivial injury as the mode of trauma in comparison with the males where only 12 males had this as a mode of trauma. Road traffic accidents and fall from height was about 46% mainly affecting male population.

TABLE: MODE OF INJURY IN DIFFERENT A.O. TYPES

MODE OF INJURY/ TYPE	A 1.1	A 1.2	A 1.3	A 2.1	A 2.2	A 3.1
TRIVIAL INJURY	18	1	2	6	0	6
RTA	0	1	3	6	7	0
FALL FROM HEIGHT	0	0	2	2	0	2

Trivial was the most common mode of injury in A1 group(78%), while high energy trauma resulted in A2 and A3 fracture(74%).

TABLE: SINGH'S GRADING OF OSTEOPOROSIS

SINGH'S GRADE OF OSTEOPOROSIS	I	II	III	IV	V
NO. OF PATIENTS	15	18	12	2	3

In the study, 30% patients had grade I osteoporosis, 32% had grade II and 24% had grade III. There were 4% and 6% had grade IV and V respectively.

The average radiological union in our series was 12.41 weeks ranging from 12 to 14 weeks.

TABLE: METHOD OF PLATING AND OPERATIVE TIME (MINUTES)

METHOD OF PLATING/ OPERATING TIME	MEAN	SD	SEM	T VALUE	P VALUE
CLOSED PLATING	59.424	18.514	3.223	3.807	0.0004
OPEN PLATING	77.294	7.498	1.819		

It was seen that there was direct correlation between method of plating and operative time required for each method. We subjected 33 patients to closed plating methods and 17 patients to open plating method. The average operative time required for closed plating was much less (average 59 minutes) than open plating group (average 77 minutes) with a P value of 0.0004 which is significant.

We have used S.P. Mohanty and V. Cahcko's criteria for assessment of results, by evaluating the various functional abilities of the patients and the pain experienced by the patient. In this criteria walking ability of the patient, ability to squat and sit cross legged, range of knee and hip movements and pain experienced by the patient during sitting or doing activities are taken into consideration. Based on this criterion final results were assessed as excellent, good, fair or poor depending upon the points scored. A score of 12 points means excellent and a score of below 8 as a poor result, whereas the score of 10-11 points as a good and score of 8-9 as fair result.

DISCUSSION:

Fractures of the proximal femur, including fractures affecting the trochanteric region, have become a public health problem. Owing to aging of the population, we have to operate on ever more elderly patients who sometimes present with significant co morbidities. However, the indication for surgery is indisputable, given the considerable morbidity and mortality related to prolonged confinement to bed (Bonneviall P; Feron JM,2002,2003). There is a wide array of operative treatments available for this type of fractures. Osteosynthesis using a screw plate of the dynamic hip screw(DHS) type is considered to be Gold Standard (Peyser. A,2005) for intertrochantric fractures type 31-A1 and 31-A2 in the AO classification.

Locking plates have biological advantages (Sommer C, 2003; Wagner M,2003) over the standard plates. A standard plate grips the bone by the screws. This lead to impaired blood supply(Gutwald, et al ,2003; Perren S 1988) resulting in decreased cortical thickness and cancellous

transformation of bone(Paavolainon,1978;Perren SM,2003; Stromberg L, 1978).

The age incidence in our study was from 60 years and above with an average age of 65.96 years, with mean age in males of 67.34 years and 63.94 in females. **Boyd and Griffin(1949) reported** an average incidence of 66.70 years.Dhal in 1992 and JW Barros in 1995 reported an average age incidence of 62 years and 70 years respectively.

In this series males have out numbered females with the ratio 1.7:1. Most of the authors had female predominance in their studies. Evans (1949), Anderson(1971) and Kudema in 1976 had indicated female predominance in their studies.

The study conducted correlates well with the studies of Hocaine Bensafi et al (2006) with the distribution of osteoporosis in the patients with intertrochantric fractures. As trivial trauma is the main mode of injury in these fractures in elderly, osteoporosis the main factor responsible for the weakening of bones.

The infection rate was 2%. There was no incidence of chest infection, no pressure sores, no thromboembolic complication and of course as mortality. J.Hogh, Aarhus County Hospital Denmark reported a post operative mortality rate as 13% in patients treated with dynamic hip screw. He also reported pressure sore incidence of 4% and pneumonia incidence of 9%. The incidence of superficial and deep infection was reported as 1% and 1% respectively.

In our study 94% of the patients had negligible shortening(less than 1) and 6% had mild shortening (1 to 3) and none had significant shortening. **Sarmiento** (1963) had attributed the shortening to the late settling of the fracture site.

SUMMARY AND CONCLUSION

This prospective study was conducted in orthocare hospital Delhi from May 1st 2015 onwards. The patients were treated with internal fixation using Locking Compression Plate Dynamic Hip Screw (LCP-DHS).

The age incidence in our series was 60 years and above with an average age of 65.96(range- 60 to 81).

The males out numbered females with the ratio of 1.7:1.

In our study A1 fractures constituted 54% with majority falling in A1.1(36%). A2 fractures comprised about 42% and A3 of 4% respectively.

Using Singh Index, the most common grade of osteoporosis were II, I and III respectively.

The most common mode of trauma was trivial injury(54%). Road traffic accident and fall from height comprised about 46% mainly affecting males.

The average operation time in the series was 59 minutes in closed plating group and 77 minutes in open plating group.

The average per operative blood loss was 70 ml in closed plating group and 200-250 ml in open plating group.

The average radiological union was 12.41 weeks.

In this series all the patients had full weight bearing by the completion of 10th week (average-8.65 weeks).

The cut out rate of Lag screw was 2%. There was no case of the plate lift-off or breakage of screws. There was no case of non union.

In our series, 94% patients had negligible shortening(<1cm), 6% patients had mild shortening(1-3cm) and none had significant shortening.

The average neck shaft angle was 122.8degree. 1 patient had moderate coxa vara(105) and two patients had mild coxa vara(110 each).

Keeping in view the above observations and dynamic hip screw with fixed angle locking screw s would reduce the risk of DHS failure. Locking screw DHS would be particularly useful in patients with poor quality osteoporotic bone and in patients with less stable fracture configurations. Further locking plate is ideal for percutaneous

insertion thus reducing the blood loss and operative time. Early weight bearing is additional advantage in elderly patients for good vocational methods.

REFERENCES

- [1]. DeLee JC, Clanton TO, Rockwood CA Jr. Closed treatment of Subtrochanteric fracture of the femur in a modified cast brace. *J Bone Joint Surg Amer* 1981; 63: 773-9.
- [2]. Robinson CM, Court-Brown CM, McQueen MM, Christie J. Hip fractures in adults younger than 50 years of age. *Epidemiology and results. Clin Orthop Relat Res* 1995; 312: 238-46.
- [3]. Kim WY, Han CH, Park Ji, Kim JY. Failure of intertrochanteric fracture fixation with dynamic hip screw in relation to preoperative stability and osteoporosis. *In Ortho*. 2001; 25: 360-2.
- [4]. Fogagnolo F, Kfuri Jr M, Paccola C. Intramedullary fixation of pertrochanteric hip fractures with the short AO-ASIF proximal femoral nail. *Arch Orthop Trauma Surg* 2004; 124: 31.
- [5]. Robinson CM, Houshian S, Khan LAK. Trochanteric-entry long cephalomedullary nailing of subtrochanteric fractures caused by low-energy trauma. *J Bone Joint Surg Amer* 2005; 87: 2217-26.
- [6]. Pajarinen J, Lindahl J, Michelsson O et al. Pertrochanteric femoral fractures treated with a dynamic hip screw or a proximal femoral nail. A randomised study comparing post-operative rehabilitation. *J Bone Joint Surg Brit* 2005; 87: 76-81.
- [7]. Ekström W, Karlsson-Thur C, Larsson S, Ragnarsson B, Alberts KA. Functional outcome in treatment of unstable trochanteric and subtrochanteric fractures with the proximal femoral nail and the Medoff sliding plate. *J Orthop Trauma* 2007; 21: 18-25.
- [8]. Campbell WC, Canale ST, Beatty JH. *Campbells operative orthopaedics*. 11th edition. Philadelphia, PA: Mosby Elsevier; 2008.
- [9]. Oh CW, Kim JJ, Byun YS et al. Minimally invasive plate osteosynthesis of subtrochanteric femur fractures with a locking plate: a prospective series of 20 fractures. *Arch Orthop Trauma Surg* 2009; 129: 1659-65.
- [10]. Saarenpää I, Heikkinen T, Ristiniemi J. Functional comparison of the dynamic hip screw and the gamma locking nail in trochanteric hip fractures: a matched pair study of 268 patients. *Int J Orthop* 2009; 33: 255-60.
- [11]. Wieser K, Babst R. Fixation failure of the LCP proximal femoral plate 4.5/5.0 in patient with missing posteromedial support in unstable pre-, inter-, and subtrochanteric fractures of the proximal femur. *Arch Orthop Trauma Surg*. 2010; 130: 1281-7
- [12]. Parker, MJ, Handoll HH. Gamma and other cephalocondylic intramedullary nails versus extramedullary implants for extracapsular hip fractures in adults. *Cochrane Database Syst Rev*. 2010 Sep 8; (9):
- [13]. ZhaGe Chen ZL, Qi XB, Sun JY. Treatment of pertrochanteric fractures with a proximal femur locking compression plate. *Surgery*. 2011; 42(11): 1294-9.
- [14]. Zhu QL, Yan MH, Zhao LL, Xu B, Rong LJ, Luo JM. Analysis of treatment of osteoporotic intertrochanteric fracture of femur with the locking compression plate (LCP). *ZhongguoGu Shang*. 2011; 24(5): 378-81
- [15]. Wang Y, Yang YY, Yu ZH, Zheng XX. A Comparative study of intertrochanteric fracture with proximal femur locking compression plate in aged. *ZhongguoGu Shang*. 2011; 24(5): 370-3.
- [16]. Glassner PJ, Tejwani NC. Failure of proximal Femoral Locking Compression Plate: A Case Series. *J Orthop Trauma*. 2011; 25(2): 76-83. Cite this article as: Meena MK, Joshi V. A comparative study between proximal femur locking
- [17]. Meena MK et al. *Int J Res Orthop*. 2016 Dec; 2(4): 327-332 *International Journal of Research in Orthopaedics* | October-December