Original Research Article

Dynamic hip screw fixation trochanteric fractures of femur

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Abstract

Background: Trochanteric fractures of proximal femur is common in old aged, osteoporotic people, most of them are elderly women than men. It is caused either by a indirect twisting injury or fall directly onto the greater trochanter. **Methods:** This study was conducted in Department of Orthopaedic, M.G.M. Medical College and L.S.K. Hospital. Kishanganj, Bihar Patient with age 30 years or more with tronchanteric fracture of femur were isolated or with other injury were included duration the period from January2018 to June2018. Total 30 patients were included in our study. **Results:** Range of the age of the patients was 32 – 75 years. Average age was 56.25 years. Male: Female ratio was 1:2.07. Commonest mode of injury was minor slip-overall 53.3%. Second commonest was RTA (26.7%). All the Patients in Post operative period were allowed to sit on 3rd day. Patients were discharged in between 7-14 days from the day of operation; stitches were removed on 12-16th day on average. Most of the patients (30) were free from pain during weight bearing. Only 2 patients (6.7%) having significance shortening more than 2.3 cm. **Conclusion:** Dynamic Hip Screw fixation has been still a popular method of internal fixation for intertrochanteric fracture and is specially indicated when trochanteric fracture involving pyriformis fossa. Soit was successful methods are available for internal fixation of different types of trochanteric fractures.

Key Words:

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INTRODUCTION

The relationship between hip fracture type and individual health status (including number of co-morbidities and activity level) is controversial according to some studies, trochanteric fracture patients are biologically older than those who sustain a femoral neck fracture and that they had low general health and hospital admission, poorer pre fracture ambulatory ability and higher number of associated medical conditions that affected fracture management [1]

There are four conditions must occur if a simple fall resulted in hip fracture incorporating trochanteric fractures:

- The orientation of the fall must lead to an impact at or near the hip.
- Protective responses are too weak or slow to adequately reduce the potential energy of the fall.
- The soft tissues around the hip are unable to absorb adequate energy.
- The bone strength is inadequate to tolerate the remaining forces that reach the hip[2].

Undisplaced trochanteric fractures can be much more difficult to diagnose accurately from the initial clinical and radiographic evaluation. Repeated orthogonal radiographs with the hip in internal rotation may be helpful to demonstrate the fracture line. Further diagnosis may include the CT scan, technetium bone scan or MRI, however these are not used in this study[3]. Fractures that occur in young people are usually due to road traffic accident and fall from heights and resulted in a much larger energy transfer to the bone. There is invariably more soft-tissue injury, with significantly more fracture displacement

and fragmentation than in the geriatric population the initial evaluation, history and examination follow Advanced Trauma Life Support (ATLS) guidelines, and additional fractures, as well as injuries to other organ systems, must be actively looked for and ruled out[4]. Increased fracture fragmentations around trochanteric region and particularly the fractures in the coronal plane are not well appreciated on routine radiographs, further evaluation including superior investigations may be needed in these situations[5].

METHODS

This study was conducted in Department of Orthopaedic, M.G.M. Medical College and L.S.K. Hospital. Kishanganj, Bihar Patient with age 30 years or more with tronchanteric fracture of femur were isolated or with other injury were included duration the period from January2018 to June2018. Total 30 patients were included in this study.

Implants

DHS Plate are made up of 316 L stain less steel with screw hole as per length of the plate. It has a low profile design reducing risk of trochanteric bursitis. These are available in a wide range of size and barrel angle, with standard or short barrels, for varied clinical situation.

DHS – standard barrel plate (38 mm) Barrel angle:135º/140º/145º/150º

No of hole	Shaft Length (mm)
2	46
4	78
5	94
6	110
8	142
10	174
12	206
14	238
16	270
18	302
20	333

DHS- Short barrel (25 mm barrel) Barrel angle:135º/ 140º/145º/150º

No of hole	Shaft length(mm)
4	78
5	94
6	110

DHS Lag screw

Thread diameter : 12.7 mm
Thread Length : 22 mm/16 mm
Shaft diameter : 8 mm
Pitch : 3.0 mm
Diameter of cannulation: 2.7 mm
Available from 50 to 145 mm of length.

RESULTS

Among 30 cases of trochanteric fractures of femur, most of them were purely intertrochanteric fractures while some of them were intertrochanteric with subtrochanteric extention.

All these patients were followed up for 6 month at 6th, 12th, 18th and 24th week.

Table 1: Age Distribution

Age Group	No of Cases	Percentage (%)
30-40 Years	2	6.7
41- 50 years	5	16.7
51-60 years	8	26.6
60-70 years	10	33.3
>70 Years	05	16.7
Total	**30**	**100**

Range of the age of the patients was 32 – 75 years. Average age was 56.25 years.

Table 2: Sex incidence

Sex	No of cases	Percentage (%)
Male	11	36.7
Female	19	63.3
Total	**30**	**100**

In this study female was predominantly higher than male, the male and female ratio-1:1.72.

Table 3: Modes of injury

Mode of Injury	No. of cases	Percentage (%)
Minor slip or stumble	16	53.3
Fall from Height	2	6.7
Major Trauma	4	13.3
RTA	8	26.7
Total	**30**	**100**

Above observation of modes of injury. Commonest mode of injury was minor slip-overall 53.3%. Second commonest was RTA (26.7%).

Table 4: According to Evan's classification

Type (Evan's classification)	Non of cases	Percentage
Type I:		
Undisplaced	02	6.7
Displaced stable medial cortical apposition	11	36.7
Displaced unstable no apposition	03	10.0
Comminuted	8	26.6
Type II	6	20.0
Total	**30**	**100**

Out of 30 cases 24 (80.0%) were type 1 and 6 cases (20.0%) were type 2 (Evan's) fractures.

Table 5: Operative time

Time	No. of Cases	Percentage (%)
1 – 1.5 hours	4	13.3
1.5 – 2 hours	17	56.7
2 – 2.5 hours	9	30.0

Most of the patients operated within 1.5 – 2 hours. i.e 17 (56.7%) patients.

Table 6: Clinical union

Post operative weeks	Status of clinical union (No. of cases)			
	Swelling		Local Bony tenderness	
	Absent	Present	Absent	Present
6th week	20	10	2	28
12th week	25	5	22	8
18th week	29	01	30	00
24th week	30	00	30	00

Local swelling at fracture site present only 10 cases at 6th post operative weeks. Almost all local selling absent around 12 – 18 weeks. Local bony tenderness disappears around at 18 – 20 weeks.

Table 7: Weight bearing ability

Time interval in weeks	No. of cases	
	Partial weight bearing	Partial weight bearing
6th	08	00
12th	18	00
18th	24	08
24th	30	22

At 6th post operative week only 08 patients were allowed Partial weight bearing. Almost all patients (except one patient with proximal cut through of hip screw) were allowed 22 patients were capable Full weight bearing at 24th week. All the Patients in Post operative period were allowed to sit on 3rd day. Static quadriceps, Hamstring exercises are started. Non weight bearing crutch walking was advised depending upon the general condition of the patients and quality of fixation. Sometimes derotation shoe/plaster were given when any doubt regarding stability of int. fixation. Patients were discharged in between 10-20 days from the day of operation; stitches were removed on 12-18th day on average. Most of the patients (22) were free from pain during weight bearing Only 2 patients (6.7%) having significance shortening more than 2.3 cm.

DISCUSSION

Among DHS/DCS/Intramedullary devices fixation in trochanteric fracture, placement of DHS may be a simple job according to some study[26]. But it may become more easier by presence of following factors like timely surgery, judiuous planning of surgery, reduction technique, proper used of C-arm image intensifier, experience of the surgical team etc[6]. Dynamic hip screw as stated before is a alternative in Type II (Evan's classification) trochanteric fractures[7]. This category of fracture along with unstable variety of trochanteric/peritrochanteric fractures can be fixed with 135° DHS; inter trochanteric osteotomy followed by intra medullary fixation to achieve proper restoration of medial continuity[8]. Therefore it has been concluded that Evan's Type II factures are distal and parallal to the position of a 135^0 sliding screw, therefore fragment will not impact into a local sharing configuration, resulting in distal fragment tends to medialize. As a result of malunion occurred. But recently better devices are available for fixation of type II fractures. However, our main aims was to assess the outcome of DHS fixation, to achieve early mobilization, union at fracture site and finally rehabilitation. In our study, we perform a prospective study, in Dynamic hip screw (DHS) fixation in trochanteric fracture of femure. We encountered severe shortening (> 2.3 cm) in only two-cases (6.7%) in DHS series, but moderate shortening (1-2.5 cm) was found in 13 cases (32.50%). Shortening are mainly due to collapse at fracture site or deformity. Union was evaluated by both clinically (swelling and bony tenderness) and radiologically bridged by callus. In this series the average time of union 24th weeks in DHS series

Apart form the problems and complications as stated above, the over all results according to Harris hip score, are as follows:-

- Good : 20 (66.7%)
- Average : : 08 (26.7%)
- Poor : 2 (6.7%)

In the present series, study was done on limited number (30) of cases. However the functional result is good in majority of cases.

CONCLUSION

In present study it is concluded that dynamic hip screw (DHS) fixation is technically simple but effective procedure for fixation of inter trochanteric fracture of femur. Dynamic Hip Screw fixation has been still a popular method of internal fixation for intertrochanteric fracture and is specially indicated when trochanteric fracture involving pyriformis fossa. Soit was successful methods are available for internal fixation of different types of trochanteric fractures.

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