

Original Research Article

To evaluate factors that affect the functional outcome of trochanteric fractures treated with DHS.

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Abstract:

Background & Method: This is a retrospective & prospective study was conducted in the Department of Orthopaedics of Index Medical College Hospital and Research Centre, Indore, M.P. from April 2020 to December 2021. In this study 70 cases of closed Trochanteric fractures that fit into any of the five grades of Evan's classification of trochanteric fractures with age 20 year and above which were admitted in the Orthopaedic wards and treated by internal fixation using standard Dynamic Hip Screw (DHS) were included. Pathological trochanteric fractures were excluded as their functional results differ.

Result: In our study 70 % patients is age between 40 – 80 years and advised procedure to improve result is more required in evan grade III , IV and V . functional result correlates with anatomic reduction achieved intra operatively and out of 45 patients 41 patients has good and excellent result .

Conclusion: Strong association with functional outcome and high statistical correlation with excellent or good results indicate that achieving anatomic reduction and attaining TAD index value less than 25mm are recommended for obtaining better functional outcome and good predictor of functional outcome.

Keywords: outcome, trochanteric, fractures & DHS.

Study Designed: Observational Study.

1. INTRODUCTION

The rapidly increasing number of hip fractures is posing one of the most severe Orthopaedic challenges in the new millennium. Intertrochanteric fractures of the femur once considered essentially a disorder of the elderly, are now equally common in young adults due to increased incidence of high energy trauma^[1].

The overall increase in the incidence of intertrochanteric fracture can be attributed to two factors, one, increased life expectancy which increases the aged population, secondly high energy trauma which victimizes more number of young adults. Due to these reasons, both developing and developed countries are facing a sort of epidemic of intertrochanteric fractures^[2].

Therefore, renewed attention should be paid to evaluate and improve the performance and longevity of Orthopaedic interventions aimed at treating intertrochanteric fractures^[3]. The challenge the Orthopaedic surgeon faces lies in combining union in a good position with

minimal morbidity, maximum comfort to the patient, early mobilization, decreased complication rate and the greatest economy of hospital beds, Not much attention was paid to intertrochanteric fractures till 19th century and the mortality rate of intertrochanteric fracture was about 80%, those who survived remained morbid due to bedsores, cystitis, joint stiffness deep vein thrombosis, hypostatic pneumonia, shortening and Coxa vara.

The treatment of intertrochanteric fractures has also passed through several stages, initially, these fractures were treated conservatively by means of external splintage, skin traction, skeletal traction and balanced Russell traction^[4]. In spite of improvement and modification in the conservative line of treatment, the ideal anatomical and functional result could not be achieved. Prolonged immobilization in bed was another important threat to the life of elderly patients. The problem is not of the union but of complications arising out of immobilization in bed till fractures heal. Also in the young age group where high-energy trauma is often the culprit mode, the anatomy is distorted to the extent that, generally conservative treatment finds no scope^[5].

The history of the treatment of intertrochanteric fractures has been of changes, modification and evaluation. The radical concept of operative management of intertrochanteric fractures has got new thinking in the last four decades. Improvement in theatre techniques, the evolution of newer strong and inert metal for implants, improved devices and techniques for fixation, advancements in radiology and the application of biomechanical principles to fixation has contributed to increased incidence of operative management of intertrochanteric fracture and reduced the value of conservative treatment due to complication associated with it. Several methods of internal fixation were advocated in the treatment of intertrochanteric fractures, variable angle nail plate by McLaughlin, which facilitated early painless weight-bearing and compression at the fracture site, especially unstable ones^[6].

Trochanteric stabilization plate to DHS reconstruct lateral trochantric wall & helps to prevent excessive lateral sliding of the proximal fracture fragment. Excessive fracture impaction and consecutive limb shortening prevented by this additional implant^[7]. TSP effectively supports the unstable greater trochanter fragment and can prevent rotation of the head-neck fragment. Value of this implant in preventing femoral medialisation in this specific type of intertrochanteric fracture merit further evaluation.

2. MATERIAL & METHOD

This is a retrospective & prospective study was conducted in the Department of Orthopaedics of Index Medical College Hospital and Research Centre, Indore, M.P. from April 2020 to December 2021. In this study 70 cases of closed Trochanteric fractures that fit into any of the five grades of Evan's classification of trochanteric fractures with age 20 year and above which were admitted in the Orthopaedic wards and treated by internal fixation using standard Dynamic Hip Screw (DHS) were included. Pathological trochanteric fractures were excluded as their functional results differ.

There were 44 male and 26 female patients with youngest one 20 year old and the oldest one aged 86 year. Detailed history of selected cases especially regarding mode of trauma, pre-operative medical and associated illness, ambulatory status, activities of daily living before trauma was recorded. X-rays of the affected extremities were done X-rays affected hip – AP View & Lateral View. Depending upon the age and pattern of fracture as per x-ray, above knee skin traction or upper tibial Steinmann pin skeletal traction in Thomas splint was

applied. Intraoperatively in fracture table fracture was reduced and checked with c arm. Lateral approaches used and standerd dynamic hip screw fixed. Postoperatively non weight wearing walking with walker started, suture removal done at 12 day, after 3 weeks toe touch walking started , after 6 weeks full weight wearing started. Patients regularly followed till 6 month than 8 month.

3. RESULTS

Table No. 1: Age and Sex Incidence

Age group in years	No. of male patient	No. of female patient	Total	%
20-40 yrs.	11	4	15	21
41-60 yrs.	12	11	23	33
61-80 yrs.	16	10	26	37
80 < yrs	5	1	6	9
Total	44	26	70	100

Table No. 2: Mode of trauma

Mode	No. of patient
1. Vehicle Accidents	34
2. Slip & fall on ground	28
3. Fall from Height	7
4. Direct Assault	1
Total	70

Table No. 3: Additional Procedures done along with DHS Fixation

Type of Fracture	Bone Grafting	Interfragmentary Screws
Evan's Grade I	0	0
Evan's Grade II	2	0
Evan's Grade III	5	2
Evan's Grade IV	6	2
Evan's Grade V	7	1

Table No. 4: Functional Results in various fracture grades

Fracture grades	Functional Results				Total
	Excellent	Good	Fair	Poor	
Grade 1	5	4	1	1	11
Grade 2	3	9	1	0	13
Grade 3	9	6	2	0	17

Grade 4	4	12	2	1	19
Grade 5	1	4	2	3	10
Total	22	35	8	5	70

- * Total 5 failures were noted
 3 = Screw cut out
 2 = Plate Breakage

Table No. 5: Reduction in different fracture groups

Reduction Achieved	Fracture Groups					Total
	Grade I	Grade II	Grade III	Grade IV	Grade V	
Anatomic	11	12	8	11	3	45
Non-Anatomic	0	1	9	8	7	25
Total	11	13	17	19	10	70

Table No. 6: TAD Index correlated to reduction achieved

Fracture pattern	TAD Index			Total No. of Cases
	<25 mm	25-35 mm	35 mm & <	
Anatomic	39	5	1	45
Non-anatomic	11	8	6	25
Total	50	13	7	70

Table No. 7: Functional results correlated with reduction achieved

Reduction achieved	Functional Results				Total
	Excellent	Good	Fair	Poor	
Anatomic	17	24	3	1	45
Non-anatomic	5	11	5	4	25
Total	22	35	8	5	70

4. DISCUSSION

Sperner et al (1989) in their study "Technical errors and early complications of osteosynthesis of pertrochanteric femoral fractures using the dynamic hip screw" found out that most preoperative failures in management were caused by insufficient reduction when no valgus of the femoral head and neck was achieved. Some patients had ulcers in the genital region because of forced reduction on the traction table^[8]. Intraoperative failures may occur because of too early removal of the guide pin, which should remain in the center of the femoral head until the screw is placed in the right position. Postoperative complications are caused by early full weight bearing, which leads to varus and recurvation malposition.

Mains and Newman in 1989, concluded that placement of sliding hip screw in superior half of the head and neck of femur resulted in large no. of mechanical failures than placement in inferior half^[9].

In 1990, Davis TR, Sher JL, Horsman A, Simpson and Poster BB showed that cut out of lag screw was the cause of mechanical failure of trochanteric fracture fixation in more than three quarter instances. Implants those were not placed centrally in the femoral head higher chances of cut out. They concluded that these fractures should be reduced as accurately as possible and it is imperative that the implant is placed centrally within the head.

In 2005, Templeman, Baumgaertn and Leighton in their landmark tutorial article stated that “the increasing number of hip fractures in the elderly constitutes a health care burden. The subset of unstable intertrochanteric hip fractures is important because the treatment of these fractures continues to be hampered by a moderate complication rate^[10]. Osteoporosis, fracture geometry, and the success of surgical treatment are strong predictors of outcome. The surgeon is in control of fracture reduction, implant selection, and implant placement, all of which must be optimized to ensure the success of surgical intervention”

Joseph, Thomas N, et al (2002) in their study evaluated the effects of posterior sag on the fixation stability of intertrochanteric hip fractures and found that 30 degrees of posterior sag does not result in a significant difference in construct strength or stability^[11].

In our study show type of fracture pattern according to Evans classification grade 5 fracture pattern lead to more failure and bone graft procedure. TAD INDEX and anatomic reduction of fracture also more deciding factor for functional outcome.

5. CONCLUSION

Out of 45 patients in whom anatomic reduction was achieved 41 had excellent or good results at the end of 6 months. Similarly out of 50 patients in which implant was placed appropriately (i.e. TAD index <25 mm & central placement of Richard screw), 49 had excellent or good results.

When we correlated anatomic reduction achieved to TAD index value attained, we found that most patients in whom anatomic reduction was achieved, implant was placed optimally and TAD index was less than 25 mm.

Strong association with functional outcome and high statistical correlation with excellent or good results indicate that achieving anatomic reduction and attaining TAD index value less than 25mm are recommended for obtaining better functional outcome.

6. REFERENCES

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