Outcome of Intertrochanteric Fractures in Elderly Patients treated with Dynamic Hip Screw.

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ABSTRACT

Objective: To determine the functional outcome of intertrochanteric fractures in elderly patients treated with Dynamic Hip Screw(DHS).

Methods: This descriptive study was conducted in Orthopaedic Unit Pakistan Railway General Hospital Rawalpindi from 16th February 2016 and 16th February 2021.All elderly patients with stable intertrochanteric fractures(Evans type IA and Type IB) fulfilling the inclusion criteria were treated with DHS and functional outcome was evaluated at 6 months with Harris Hip Score(HHS) and results were graded as excellent(HHS score 90 to 100),good(HHS score 80 to 90), fair(HHS 70 to 80) and poor(HHS score <70).

Results: We operated 280 patients of intertrochanteric fractures with DHS. The mean age was 65.49±7 years. Male patients were 170(60.71%) and female 110(39.28%). Excellent outcome was documented in 151(53.92%), good in 90(32.14%),fair in 22(7.85%) and poor in 17(6.07%) with HHS score of 93.3±5,88.7±7, 77.3±4 and 33.1±9 respectively.

Conclusion: Elderly patients with stable intertrochanteric fractures treated with Dynamic Hip Screw(DHS) yielded excellent and good functional outcome in majority of our patients. We recommend DHS an implant of choice to treat stable intertrochanteric fractures in elderly patients.

Keywords: Dynamic Hip Screw, Harris Hip Score, Intertrochanteric.

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INTRODUCTION

Intertrochanteric fracture is one of the major public health concern since it is the most serious consequence of osteoporosis in the elderly population.[1] The prevalence of this fragility fracture rvaries significantly across the nations ranging from 37 to 399.3 per 100,000 population per year for men and 97.5 to 920.7 / 100,000 population per year for women.[2] Overall this fracture accounts for 7% of all osteoporotic fractures.[3] Intertrochanteric hip fractures typically occur between the greater and lesser trochanter.[4] These fractures are common in older adults with osteoporosis and lead to morbidity and mortality in elderly patients.[5] Although these fractures are due to high energy trauma in younger population,[6] around 90% of intertrochanteric fractures occur in people over the age of 65 years,[7] resulting in higher incidence of low quality of life, loss of function and higher mortality.[8] Patients with intertrochanteric fractures need early mobilization to avoid bedsores, urinary tract infections and thromboembolism.[9] Although fracture reduction and internal fixation with a Dynamic Hip Screw (DHS) is the preferred implant for treating this fracture, other fixation devices such as cephalomedullary nail and proximal femoral locking plate can also be used to treat intertrochanteric fractures.[10] Non-surgical procedures for intertrochanteric fractures are rarely employed under certain circumstances such as when the patient has been immobile before fracture or when there is a higher risk of mortality due to anaesthesia or comorbidities.[11] Many studies reported superior functional outcome with DHS when stable intertrochanteric fractures were treated with DHS and compared with other implants.[11-13]

The objective of our study was to determine the functional outcome of with intertrochanteric fractures in elderly patients treated with Dynamic Hip Screw (DHS).

METHODS

We conducted this descriptive study in Orthopaedic Unit Pakistan Railway General Hospital Rawalpindi from 16th February 2016 and 16th February 2021.All patients with 60 years and above having stable intertrochanteric fractures(Evans type IA and Type IB) presented to Accident and Emergency department and OPD of our hospital within a week of sustaining the fractures were included in our study. Polytrauma patients requiring surgical intervention for other fractures or abdominal, thoracic and head injuries were excluded. Patients with pathological fractures, open fractures, re-surgery and those who could not completed the follow up were excluded.

The study was approved by the Institutional Review Board of our hospital. Informed consent was obtained from all the participants of our study. Complete history, clinical examination and relevant investigations were carried out in all the patients. Fractures were radiologically classified as per Evans classification[14] of intertrochanteric fractures.

After optimizing the general condition of the patients surgery was performed on elective operation day on traction table using image intensifier. Spinal or general anaesthesia was used for surgery. All surgeries were performed by the same team following identical standard surgical technique. Fracture was reduced with traction and manipulation and confirmed with image intensifier. Fixation was done with 4 hole 135° angle slide plate DHS(® Esmeco) and appropriate lag screw positioned in the posterioinferior portion of femur neck and maintaining the tip apex distance(TAD) fulfilling the inclusion criteria were treated with DHS and functional outcome was < 25 millimeter. Supervised physiotherapy was initiated on first post operative day.All the patients were instructed for follow up visits at 2nd week and then every 4th week for 6 months. In each visit patients were assessed clinically and radiologically. At 6th months follow up functional outcome was assessed with Harris Hip Score (HHS)[15] and results were graded as excellent(HHS score 90 to 100),good(HHS score 80 to 90),fair(HHS 70 to 80) and poor(HHS score <70).

The data was analyzed with SPSS version 23.Important qualitative variables were represented as frequency and percentage while quantitative variables as mean and standard deviation (SD). Comparison of HHS among fracture type, gender and side was compared and *P* value was calculated with independent sample t test. *P* value< 0.05 was considered significant.

RESULTS

In this study 280 patients of stable intertrochanteric fractures were treated with DHS. The mean age was 65.49±7 years. Majority(60.71%,n=170) of our patients were male while female patients were 110(39.28%).The aetiology of fracture was simple fall in 172(61.42%) ,road traffic accidents in 85(30.35%) and physical assault in 23(6.21%).Right sided intertrochanteric fracture was present in 182(65%) and left in 98(35%).The type of fracture was Evan type IA in 178(63.57%) and type IB in 98(35%) patients. Primary union was achieved in 271(96.78%) patients without additional surgeries. Excellent functional outcome was documented in 151(53.92%), good in 90(32.14%),fair in 22(7.85%) and poor in 17(6.07%) with HHS score of 93.3±5,88.7±7 , 77.3±4 and 33.1±9 respectively. No statistically significant difference(P value > 0.05) was noted in HHS when comparison was made among type of fracture, gender and side of fracture. Superficial surgical site infection was the predominant complication(7.85%,n=22) documented in our study as shown in table I. All the complications were treated accordingly ranging from conservative treatment to debridement and revision. Data was presented in table where necessary.

Table I: Post operative complications in our study.

S. No	**Post operative Complications**	**Number of patients**	**Percentage**
1	Superficial surgical site infection	22	7.85%
2	Deep infection	5	1.78%
3	Limb shortening	4	1.42%
4	Lag screw cut out	4	1.42%
5	Lag screw migration	2	0.71%

DISCUSSION

In our study we treated 280 elderly patients of intertrochanteric fractures with DHS and documented excellent functional outcome in 151(53.92%), good in 90(32.14%),fair in 22(7.85%) and poor in 17(6.07%) patients. Alam and Jan[16] treated 86 patients of intertrochanteric fractures with DHs and noted excellent functional outcome in 18(24.66%),

good in 43(58.91%),fair in 9(12.33%) and poor in 3(4.11%) patients as per Kyle's criteria of assessment. Other local studies [17-19] also reported excellent to good functional outcome of intertrochanteric fractures in elderly when treated with DHS.

Our inclusion criteria was stable intertrochanteric fractures. Pirwani[20] however, treated 20 patients of stable intertrochanteric fractures and 20 unstable intertrochanteric fractures with DHS. Post operative assessment with Stinchfield Hip Assessment Score(SHAS) revealed excellent outcome in 28(70%), good in 5(12.5%),fair in 4(10%) and poor in 3(7.5%). Pirwani advocated the use of DHS for treating both stable and unstable intertrochanteric fractures.

The design of our study was descriptive. In one comparative study by Saarenpaa and colleagues[21] 134 patients were treated with either DHS or Gamma nailing and evaluated the results as per Standardised Audit of Hip Fractures in Europe (SAHFE) Hip fracture Follow-up Forms. The post operative walking ability was better in DHS group with lower mortality in DHS group than in gamma nailing group.

We adopted conventional technique of opening the fracture site with adequate incision followed by fixation with DHS. Lee and Huang treated[22] 122 patients with conventional and minimally invasive technique and noted that no statistically significant difference existed in the post operative functional outcome between the two methods.

We used 4 hole side plate of DHS in all of our cases. This was in accordance with the findings of Wang[23] as he demonstrated that shorter length (2 hole) side plate would result in higher stress on cortical screws and femur and plate pull out.

In our study anti-rotation 6.5mm cancellous screw was inserted in 80(28.57%) cases. Lag screw migration in 2(0.75%) of our cases did not have anti-rotation screw. Similar to our study Kim and Chang[24] reported screw migration in 12(31.6%) of their cases without anti-rotation screw. These authors concluded that lag screw migration can be prevented if ant-rotation screw is inserted alongwith lag screw.

Our study had few limitations. The design of our study was descriptive and follow up was short. Further studies are recommended to confirm our results.

CONCLUSION

Elderly patients with stable intertrochanteric fractures treated with Dynamic Hip Screw(DHS) yielded excellent and good functional outcome in majority of our patients. We recommend DHS an implant of choice to treat stable intertrochanteric fractures in elderly patients. DHS has the added advantage of economic feasibility to the patients and easy learning curve for junior surgeons.

Conflict of Interest: None

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