Introduction

In recent decades the number of cases of proximal femoral fractures has dramatically increased. One of the reasons for this increase is the aging of the population. Half of all hip fractures in elderly are intertrochanteric fractures more than 50% of which are of unstable variety. About 5% of these fractures occur in the age group of 20-40 yrs while 75% occur in the age group above 70 yrs indicating a bimodal pattern of occurrence. Because they occur in the elderly and in persons with low bone stock, they usually tend to be of unstable pattern. About 1/3 of these fractures occur in the elderly, out of which 2/3 occur in the age group more than 50 yrs, the rest either have multiple comorbidities or have chronic illnesses. These group of patients owing to their age have multiple co-morbidities and in persons with low bone stock they usually tend to be of unstable pattern. The majority of hip fractures are caused by one of the two mechanisms: direct trauma or fall from standing height. Mortality is directly related to the number of associated injuries, the age of patient and the anatomic type of fracture. The anatomic type of fracture is classified according to Watson Jones, is due to malunion secondary to shortening and coxa vara. This can be prevented by early intervention and fixation avoiding the deformity from occurring and interfering with the limb length and severity of the hip joint.

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Keywords: Intertrochanteric fractures, proximal femoral fractures, dynamic hip screw, DHS

Methods and Materials

Aim: To assess the clinical and functional outcome of using a Dynamic hip screw in the treatment of stable intertrochanteric fractures.

Methods:

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Abstract

Purpose: To assess the clinical and functional results of using a Dynamic hip screw in the treatment of stable intertrochanteric fractures. Intertrochanteric fractures are classified into four types, A, B, C, and D. Type A fractures are the least stable and Type D are the most stable. The current investigation was done in the Orthopedics department of RIMS, Raichur to assess the clinical and functional results of using a Dynamic hip screw in the treatment of stable intertrochanteric fractures.

Methods: A retrospective study was done in the Orthopedics department of RIMS, Raichur. Over a period of one year starting from November 2016 to November 2017, 20 patients diagnosed with stable intertrochanteric fracture were treated with a Dynamic Hip Screw. We had 11 male and 9 female patients in the study group. Their mean age was 56.8 years. All of them had unilateral Type 1 Boyd and Griffiths intertrochanteric fractures which are described as stable fractures. None of the cases had unstable fracture patterns according to Watson Jones. The mean follow up period was 30.6 (21 to 41) months. There were no cases of fracture fixation failure. The mean functional score was 95.6 (78.8 to 100).

Results: We had 11 male and 9 female patients in the study group. Their mean age was 56.8 years. All of them had unilateral Type 1 Boyd and Griffiths intertrochanteric fractures which are described as stable fractures. None of the cases had unstable fracture patterns according to Watson Jones. The mean follow up period was 30.6 (21 to 41) months. There were no cases of fracture fixation failure. The mean functional score was 95.6 (78.8 to 100).

Conclusion: We observed that Dynamic Hip Screw when used for stable intertrochanteric fractures produced excellent functional outcomes. The mean functional score was 95.6 (78.8 to 100). Prolonged recumbency in these patients, according to Watson Jones, is due to malunion secondary to shortening and coxa vara. This can be prevented by early intervention and fixation avoiding the deformity from occurring and interfering with the limb length and severity of the hip joint. We observed that Dynamic Hip Screw when used for stable intertrochanteric fractures produced excellent functional outcomes. The mean functional score was 95.6 (78.8 to 100).
results of use of DHS in our patient population with stable intertrochanteric fractures. DHS was considered the gold standard for the fixation of intertrochanteric fractures during the 80s and 90s. It consists of a large fragment side plate with a barrel at the plate’s proximal end angled at varying degrees, ranging from 125 to 150 degrees. It consists of a 12.5 mm large diameter lag screw of lengths between 65 to 135 mm. They work on dynamic compression principle and have been found to fail due to screw cut out or plate pull off. Also, their allowance for controlled collapse, resulting in shortening and changes in abductor function, has driven the search for more stable treatment options \[19\].

Materials and Methods
This was a single site study, carried out at Raichur Institute of Medical Sciences, Raichur between November 2016 and November 2017. Ethical clearance was obtained from the institute’s ethical committee. There were 20 patients included in the study. All cases were diagnosed to have type 1 stable fractures as per Boyd and Griffin classification (1949).

Type 1: Stable (two part)
Type 2: Unstable with posteromedial comminution
Type 3: Subtrochanteric extension with lateral shaft extension of the fracture distally at or just below the lesser trochanter
Type 4: Subtrochanteric with intertrochanteric extension with the fracture lying in at least 2 planes \[20\].

Patients who were unfit for surgery, those who did not give consent, those suffering from terminal illnesses or malignancies with short life expectancy, patients with cognitive disturbances, polytrauma, those who were non ambulant preinjury were excluded from the study. Medical fitness for surgery was obtained and all were fixed using Dynamic hip screw by a single surgeon under subarachnoid block.

Patient was put on a traction Fig with the fractured limb put on longitudinal traction and the normal limb placed in a well leg holder. Fracture reduction was done under fluoroscopic guidance and fixation started after good to satisfactory reduction, as per Baumgartner’s criteria \[21\], was obtained. A lateral incision for guide wire, lag screw and side plate insertion was used. A tip apex distance of < 25 mm was aimed at. Intravenous antibiotic coverage was started 30 minutes prior to the skin incision and continued for 5 days postoperatively. Knee mobilization, static quadriceps exercises were started from the first postoperative day. Follow up was carried out at regular intervals. Radiographic and functional assessment using Harris Hip score were carried out at each follow up. Quality of reduction was assessed using modified Baumgaertner criteria \[21\].

Results
20 patients, 11 men and 9 women underwent diagnosed with simple intertrochanteric fractures were fixed using dynamic hip screws. All reductions were achieved using closed methods. The group’s mean age was 56.8 years and ranged from 28 to 80 years. All the fractures classified as per Boyd and Griffin classification were type 1, stable fractures. The average duration from the day of admission to day of surgery was 4.8 days (3 - 7 days). All surgeries were performed by a single surgeon, the senior most of the authors. There were no intra operative complications. The mean surgical time was 25 mins (20 - 30 mins). Tolerated assisted weight bearing was begun from the 2nd to 10th postoperative day based on patient’s pain tolerance. The mean follow up period in our study was 30.6 months (21 - 41 months). Harris hip score was 93.6 on an average with a range of 78.8 to 100. Fifteen were excellent, three good, two fair and none were poor. None of our cases underwent reoperations nor was there any mortality during the study period.

Fig 1: Functional outcomes in accordance to Harris Hip Score. 75% had excellent, 15% had good and 10% had fair results. There were no poor outcomes.

Fig 2: Preoperative x ray showing a type 1 intertrochanteric fracture. Alongside is the immediate postoperative x ray showing satisfactory reduction as per Baumgaertner criteria.

Fig 3: Images depicting active range of motions of the case shown in fig 1 at 6 months follow up.

Fig 4: Preoperative, immediate postoperative and 6th month follow up X-rays of another of our case.
Discussion
The elderly are typically predisposed to sustain intertrochanteric fractures [22]. Subjecting this group of population to surgical intervention is fraught with possibility of occurrence of complications due to multiple factors like reduced functional reserve, depressed immune system, multiple co morbid conditions and increased risk of anesthetic complications [23]. Dynamic hip screw is one of the most commonly used implants to fix intertrochanteric fractures [24]. It is preferred more for stable fractures than for unstable ones as the revision rates for unstable fractures are as high [25, 26].

In the present study we fixed 20 cases of stable intertrochanteric fractures with Dynamic hip screws and sought to evaluate their functional outcomes.

In our study, though there were no poor functional outcomes; we observed that with increasing age the functional outcomes declined as we could only achieve fair outcomes in patients of age group between 71 to 80. However some studies found no direct influence of age on the rate of complications [25].

We found no cases of avascular necrosis (AVN) of the femoral head whose risk according to Feng Yang et al. is elevated in patients with co morbid conditions like hypertension, Diabetes mellitus and ischemic heart disease which predisposes to atherosclerosis subsequently leading to AVN [28].

We did not observe any cases of non union as described by Beam et al. though our patient population demographically was at risk for impaired bone healing [29].

In our study, 75% of patients had excellent, 15% had good while 10% had fair results. In comparison, Mardani Kivi et al. had 31.7% excellent, 63.3% good and 5% fair results [30]. Shetty et al. found 59.4% of their patients with unstable intertrochanteric fractures treated with DHS augmented with trochanteric stabilization plate had excellent to good results [31]. Barwar et al. observed 45.8% of their patients to have excellent results at the end of a year, having used DHS with a locking side plate to treat intertrochanteric fractures [32]. The higher percent of excellent results in this study could be attributed to the fact that, unlike the other mentioned studies, we included only stable fractures in this study as per the protocol of the institute.

Conclusion
We observed that Dynamic Hip Screw when used for stable intertrochanteric fractures results in excellent to good functional outcomes however increasing age may cause a decline in functional scores.

References

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