The Professional Medical Journal
www.theprofesional.com
DOI: 10.17957/TPMJ/16.3056

ORIGINAL PROF-3056

DYNAMIC HIP SCREW (DHS)

EVALUATION OF STABLE AND UNSTABLE INTERTROCHANTERIC FRACTURE OF FEMUR FIXED

Dr. Mehtab Pirwani[1], Dr. Abbas Memon[2], Dr. Shakeel Ahmed Memon[3]

1. MBBS, MS
Assistant Professor
Orthopedic Department
Liaquat University Hospital
Hyderabad
2. MBBS, FCPS
Assistant Professor
Orthopedic Department
Liaquat University Hospital,
Hyderabad
3. MBBS, MS
Consultant Orthopedic Surgeon
Liaquat university Hospital Jamshoro

Correspondence Address:
Dr. Mehtab PIrwani
C/O National Medical Centre near
National CNG Khurshid Town Naka
Hyderabad
dr.sajidarain@gmail.com
mehtabpirwani@gmail.com

Article received on:
15/08/2015
Accepted for publication:
15/10/2015
Received after proof reading:
13/01/2016

ABSTRACT... Objectives: To analyze the comparative results of dynamic DHS fixation in stable and the unstable intertrochanteric fractures at LUH. **Study Design:** Comparative study. **Setting:** Orthopedic unit I of LUH Jamshoro. **Period:** 26th May 2010 – 25th August 2011. **Methodology:** All 40 patients with femur intertrochanteric fracture were enlisted. All cases isolated in 2 groups every having 20 patients, group A stable fracture and group B unstable fractures. After complete physical examination, examinations and fracture arrangement evaluation, patients were readied for operation. Fracture table was used in each operation. Fracture reduction was initially attempted by close manipulation and was successful in 30 (75%) cases. Lateral approach for proximal femur was used in every case. All fractures, whether stable or unstable, were reduced anatomically without any type of osteotomy and then fixed with 135° dynamic hip screw. **Results:** Mean age was 62.8.2 years of the cases. Gender ratio was 3:1. According to mode of injury were found RTA in 21 (70%) patients. Postoperative complications were recorded as; superficial infection noted in 2 (5%) patients and there was no case of deep infection. Average stay of hospital found 16.5 days in 17 (42.5%) patients belongs to stable group and 06 (15%) patients belong to unstable group. All (n=40) patients were pain free on their discharge from hospital. In all (n=40) patients we achieved union and there was no case of delayed union or non-union. We assessed functional outcome of our patients on the base of Stinchfield Hip Assessment system. According to SHAS 28 (70%) patients were excellent, 05 (12.5%) patients were good, 04 (10%) were fair and 03 (7.5) were poor. We had not found mortality in our patients. **Conclusions:** According to our conclusion DHS is the best implant for intertrochanteric fracture fixation. No matter; whether fracture is stable, unstable and fresh or old.

Key words: Stable and unstable intertrochanteric fracture of femur, DHS

Article Citation: Pirwani M, Memon A, Memon SA. Dynamic Hip Screw (DHS); Evaluation of stable and unstable intertrochanteric fracture of femur fixed. Professional Med J 2016;23(1):076-080. **DOI:** 10.17957/TPMJ/16.3056

INTRODUCTION

Intertrochanteric fracture (IF) is most well-known hip fracture and traditionally happens along a line between greater trochanter and lesser trochanter of femur.[1] Worldwide incidence of this fracture is expending as the average age of population is expending. Great incidence of these fractures in the elderly is identified with different factors as malnutrition, reduced physical movement, poor balance, impaired vision, neurological disability, changed reflexes and weakness of muscle. Ladies are more inclined by margin of 3:1 due to various factors as slightly wider pelvis with a tendency to coax vara, low active, have osteoporosis early and have osteoporosis early and live more live than men.[2] IF are absolutely additional capsular and happen through the cancellous bone. These fractures involves wide area of bone which is mostly cancellous, to the both fragments with good supply of the blood, therefore that's fractures well united, if reduction and fixation is performed properly.[3]

Treatment of IF has been done through several techniques. In the past these fractures were treated conservatively which includes simple support with pillows or splinting to opposite leg, buck's traction, well leg traction. As the fracture occurs through the cancellous bone which has good supply of the blood and great power of healing, union occurs during 8 weeks and allows weight bearing during 12 weeks. But this may lead to marked varus deformity of head-neck fragment with an associated external rotation

deformity resulting in a short leg gait and a limp. It is also associated with complication and sequel which results from prolonged immobilization in bed. To prevent the deformity resulting from the conservative treatment as well as to avoid complication as a result of prolong immobilization, surgical procedures with various implants have been tried to achieve acceptable reduction, satisfactory union and early mobilization. Each of this implant has variable success rate in achieving these aims. The DHS is latest innovations in the series with high rate of success reported from various centers for fixation of the IF.

The LUH Hyderabad/ Jamshoro is a tertiary care hospital providing good health facilities to a large population belonging to the both areas of urban and rural province of the Sindh. IF are common presentation at our center. Majority of patients are middle and old age group and most of the times, present late after injury between 3-5 weeks. This situation is different from the western world (where they present early for specialized treatment) and make reduction rather easy. The DHS is rapid and uncomplicated. It allows secure fixation of fracture and it utilizes controlled impaction during weight bearing to stabilize the fracture, thus facilitating healing and reduced the risk of fixation failure seen in other fixed rigid implants. Beside this patient can mobilized early so that complications like pneumonia, DVT could be avoided. In our circumstances DHS well known used to become stable IF. We select to perform comparative study to analyze the results of dynamic DHS fixation in stable and unstable Intertrochanteric fractures.

SUBJECTS & METHODS

This comparative study was conducted at Orthopaedic unit I of LUHI Jamshoro, to compare the results of dynamic hip screw fixation in stable and unstable intertrochanteric femur fractures in terms of union, complication and functional outcome. With time period of from 26th May 2010 – 25th August 2011. Total 40 patients of IF of femur were admitted through OPD or emergency department. All the cases intertrochanteric femur fractures age range from 20 to 70 years. All the cases of intertrochanteric femur fractures below the age of 20 years and above the age of 70 years, with open fractures, fractures associated with vascular and nerve injury, malunited fractures, pathological fractures, unfit for surgery due to co morbid illness and did not consented for study were excluded. All cases separated in 2 groups each having 20 patient, group A stable fracture and group B unstable fracture. The common modes of injury were RTA and fall. The implant used for the fixation was 135^0 DHS with standard size (38mm) barrel. In the majority of cases, a 4-hole side plate was used and the size of lag screw was variable as per length of the neck of femur.

All the patients had thorough preoperative work up including physical examination and necessary investigations to find out any associated medical conditions like cardiac or pulmonary disease, DM or any other metabolic problem. Fractures were classified according to Evan's classification. Degree of osteoporosis was assessed on radiograph and divided according to Singh's index of osteoporosis. After complete physical examination, investigations and fracture configuration assessment, patients were prepared for operation. All operations were performed under spinal anesthesia. Fracture table was used in each operation. Fracture reduction was initially attempted by close manipulation and was successful in 30 (75%) cases. Lateral approach for proximal femur was used in every case. All fractures, whether stable or unstable, were reduced anatomically without any type of osteotomy and then fixed with 135^o dynamic hip screw. Antibiotic administration was done during anesthesia. Second generation cephalosporin was administered parentally and continued into the postoperative period for seventy two hours, followed orally by the same class or one of the quinolone for further ten days. For Data analyses version 16 of SPSS was used. P value was calculated and calculated as significant if found <0.05.

RESULTS

During the study period (n=40) patients of IF of femur evaluated. Mean age was 62.8.2 years

of the cases. Minimum age was 29 years while maximum age was 70 years. Big incidence of age was found between 61-70 years of age that were 33(77.7%) patients. 30 Patients were male and remaining 10 were female making gender ratio of 3:1. According to mode of injury were found RTA in 21 (70%) patients, 17 (80.95%) were male and 04 (19.04%) were female, and simple fall reported in 09 (30%) patients, from which 06 (66.66%) were male, and 03. (33.3%) were female. (Table-I)

All Forty patients divided into two equal "A & B" groups each having 20 patients, 15 male patients and 5 female patients. (Table-I)

Postoperative complications were recorded as; superficial infection noted in 2 (5%) patients and there was no case of deep infection. So the overall post-operative complication rate was recorded 02 (5%) in stable group and 02 (5%) in unstable group, while 02 (5%) in male and 02 (5%) in female. (Table-II)

Average stay of hospital was recorded 16.5 days in 17 (42.5%) patients belongs to stable group and 06 (15%) patients belongs to unstable group. So stay of hospital in stable group was less as compare to unstable group. (Table-II)

On follow up of patients we 1st assessed Function of Hip by parameter of Pain, Range of motion of hip joint and Walking capability. All (n=40) patients were pain free on their discharge from hospital. In all (n=40) patients we achieved union and there was no case of delayed union or non-union. in our series rate of union was relatively faster (18.6 weeks) in stable fracture than in unstable (20.9 weeks) fractures. (Table-III)

We assessed functional outcome of our patients on the base of Stinchfield Hip Assessment system. According to Stinchfield hip assessment system 28 (70%) patients were excellent, 05 (12.5%) patients were good, 04 (10%) were fair and 03 (7.5) were poor. We had not found mortality in our patients. (Table-IV)

Age groups	No. Of cases	%
Age groups		
20-40 years	02	5.0%
41-50 years	02	5.0%
51-60 years	05	12.5%
Mode of injury		
RTA	27	67.5%
Fall	13	32.5%
IF		
Stable	20	50.0%
Unstable	20	50.0%

Table-I. Basic data of the patients (N=40)

Wound Complication	Stable Group (n=20)	Unstable Group (n=20)	P-value
Wound Complication			
Superficial Infection	01	01	
Deep Infection	00	00	1.02
Haematoma	01	01	
Hospital Stay(days)	14.15 days	18.4 days	.001

Table-II. Postoperative Complications (N=40)

Age groups	Average Time of Union
Stable group	18.68 weeks
Unstable group	20.9 weeks

Table-III. Time Period Of Union Of Fractures

Age groups	Average Time of Union
Excellent	28(70%)
Fair	09(22.5%)
Poor	03(7.5%)

Table-IV. Hip Assessment Of Patients(N=40)

DISCUSSION

Fractures of proximal part of femur occur as a low energy trauma in elderly patients and high energy trauma in young patients.[3] The high prevalence of these fractures in the elderly is related to various factors including malnutrition, decreased physical activity, poor balance, impaired vision, neurological impairment, altered reflexes and muscular weakness. The DHS is rapid and simple. It allows secure fixation of fracture and it utilizes controlled impaction during weight bearing to stabilize the fracture, thus facilitating healing and reduced the risk of fixation failure seen in other fixed rigid implants. Beside this the patient

can be mobilized early so that complications like pneumonia, DVT could be avoided. In our circumstances DHS is most commonly used to stabilize IF. This study compared stable and unstable managed by DHS fixation.

These fractures are great economic burden for family and also for the hospital management because of long hospital stay and bed occupancy. In our study, majority of fractures was observed between 60 to 70 years of age average age in present study was 63.9 years. This incidence is much lower than the western countries, where it occurs mostly in late seventies or early eighties like study of Khan N et al,[4] average age shows 68 years, study of Tony S et al[5] reported average age shows 76.5 years, Study of Y. S. Lee et al[6] demonstrated that mean age 71.8 years. First one is the poor socioeconomic condition of our people leading to a very low standard of living and inadequate diet and culminating development of osteoporosis and bone weakness at earlier age. Secondly, the incidence of trauma by RTA is rather too high in our country. This by several causes. While the general public by reason of illiteracy is unaware of the traffic rules, the government is apathetic in not getting the rules implemented and issuing the route permits to the defunct and unfit transport vehicles. The poor conditions of roads are further problem.

Sex incidence, the intertrochanteric fracture is more common in females in western countries like a study of 100 patients by Khan N et al[4] shows 47 (47%) male, 53 (53%) female with gender sex ratio was 0.90:1. A study of 139 patients by Tony S et al[2] shows 49 (35.25%) male, 90 (64.74%) female with gender sex ratio was 0.54: 1. Another big study comprised 600 patients by M.J Parker, et al[7] shows 121 (20.16%) male, 479 (79.83%) female with gender sex ratio was 0.25: 1. While in present study 30 (75%) male 10 (25%) with gender sex ratio 3:1, the males are more involved. The low incidence in females in our society is due to their less exposure to trauma, because most of the times they remained confined to home and are not involved in outdoor activities as frequently as the males.

With respect to the stability, we select 20 (50%) stable and 20 (50%) unstable fractures in our series. Incidence of stable & unstable fractures in different series shows increased incidence of unstable fractures. This could probably be due to the increasing incidence of high energy trauma that leads to more communication. Like study of Tony S et al[5] shows 61 (45.66%) stable and high incidence 78 (54.33%) unstable fractures, a study by Y. S. Lee[6] mentioned 102 patients with 67(66%) stable and 35 (34%) unstable fracture. Radford et al[8] reported out of 200 patients with 119 (59.5%) stable and 81 (40.5%) unstable. Post-operative complication or infection reported in present study two patients (5%) of our study had superficial infection and there was no deep infection. This rate of infection in our series is quite comparable with studies carried out at other centers in country and abroad like recent study by Annand B et al[9] reported infection rate (5 %). M.J Parker et al[8] reported 7% and Saeed& Akhtar et al[10] reported infection rate was (2.5%). However there are multiple factors which play role in development of postoperative infection like inadequate sterilization, prolong operative procedure and open reduction and excessive handling of tissues. Patient -related factors such as low resistance due to old age or associated disease like DM also adds to risk of infection. Fixation failure rate in present study was (5%). Rate of fixation failure is compared with other studies like study by Y. S. Lee[6] reported (5%) same as present study. low rate also reported in a Recent study by M.J Parker et al[7] rate of fixation failure was (1%). while in other studies reported up downs in Fixation Failure (Cut out & Penetration) like, Tony S et al[5] rate of fixation failure was3%. and Butt et al[11] reports rate of fixation failure was (12.5%).

CONCLUSIONS

This comparative study was carried out to determine the treatment results of intertrochanteric fracture fixed with DHS (DHS) and compare results in stable and UN stable types. According to our conclusion DHS is the best implant for intertrochanteric fracture fixation. No matter; whether fracture is stable, unstable and fresh or

old.

REFRENCES

1. Vossinakis IC, Badras LS. **The External fixator compared with the sliding hip screw for per trochanteric fractures of the femur.** JBJS Br.2002; 84:23-9.

2. Baumgaertner MR. **The per trochanteric external fixator reduced pain, hospital stay and mechanical complication compare with the sliding hip screw.** JBJS Am.2002; 84: 1488.

3. Terry Canale, James H. **Beaty; Fracture and dislocation of Hip. In: Campbell's Operative Orthopedics Ed.** 11th Mosby Year book 2008: 3239.

4. Khan N, Aksar Z, Ahmed I, Durrani Z, **IF of femur, Outcome of DHS in elderly patients.** P rofessional Med J Jun 2010; 17 (2); 328-333.

5. Tony Setiobudi,Yan Hong Ng. **Clinical Outcome Following Treatment of Stable and Unstable IF 0f the femur with Dynamic Hip Screw.** Ann Acad Med: Singapore Nov; 2011; 40: 482-487.

6. Y.S.Lee, H.L.Huang, T.Y.Lo. **DHS in treatment of IF. A comparison of two fixation methods.** Int.Orthop:2007. October

7. M.J Parker, T.R **Browsers, Sliding hip screw versus Tragon PF nail in the treatment of trochanteric fractures of the hip.** JBJS 2012;9;3; 391-394.

8. Radford-PJ, Needoff-M, Webh-JK. **A prospective randomizes comparison of the DHS and the gamma locking nail.** J -Bone-Joint-Surg. 1993; 75 -8: 789-93.

9. Anand B.Jabshetty. **Management of intertrochanteric fracture by DHS fixation.** Indian Journal of Science and Technology 2011;4;12;1681-84

10. Saeed-KM and Akhtar-NM. **Evaluation of dynamic compression hip screw and Jewett Nail Plate in the treatment of unstable trochanteric fracture of the femur.** The Journal of Pakistan Orthopedic Association, 1996; 2: 1-8.

11. Butt-MS, et al. **Comparison of DHS and gamma nail: a prospective, randomized, controlled trial.** Injury: International Journal of the Care of the Injured, 1995; 26: 615-8.

PREVIOUS RELATED STUDY

Najiullah Khan, Zahid Askar, Israr Ahmed, Zafar Durrani, Mohammad Ayaz Khan, Awal Hakeem, Faheem Ullah. INTERTRON-CHANTERIC FRACTURE OF FEMUR; OUTCOME OF DYNAMIC HIP SCREW IN ELDERLY PATIENTS (Original) Prof Med Jour 17(2) 328-333 Apr, May, Jun 2010.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Mehtab Pirwani	1st Author	
2	Dr. Abbas Memon	Co Author	
3	Dr. Shakeel Ahmed Memon	Co Author	