ORIGINAL RESEARCH PAPER

Volume-7 | Issue-4 | April-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

SHORT TERM ANALYSIS OF PRIMARY CEMENTED BIPOLAR HEMIARTHROPLASTY FOR UNSTABLE INTERTROCHANTERIC FRACTURES IN ELDERLY PATIENTS

Orthopedics

Dr. N. Prasanna Venkateshan M.S.Ortho Assistant professor, Department of Orthopaedics, Government Dharmapuri Medical College, Dharmapuri, Tamilnadu , India -636701.

Dr.A. Anandkumar* M.S.Ortho Assistant professor, Department of Orthopaedics, Government Dharmapuri Medical College, Dharmapuri, Tamilnadu , India -636701. *Corresponding Author

ABSTRACT

INTRODUCTION:- This study analyze the role of primary hemiarthroplasty in unstable osteoporotic intertrochanteric fractures.
Materials and Methods: We analyzed 12 cases of primary cemented bipolar hemiarthroplasty for osteoporotic unstable intertrochanteric fractures (Boyd and Griffin type II, Evans type I Group III, IV). There were 6 females and 6 males with mean age of 61 years (range, 51-73 years).
Results: one patients died due to myocardial infarction within 2 months of surgery, remaining 11 patients were followed up to an average of 8.9 months (range,6-14 months). A total of 2 out of 11 patients had excellent prognosis, 5 has good prognosis, 2 has fair prognosis and 2 has poor prognosis, accessed by Harris Hip Score. (average 80, range 25-102).
Conclusion: Hemiarthroplasty for unstable osteoporotic intertrochanteric fractures results in early ambulation, good functional results, cost effective, decreased hospitalization, improved nursing care and improved function.

KEYWORDS

Hemiarthroplasty, osteoporotic fractures, unstable intertrochanteric fractures

INTRODUCTION :

Intertrochanteric fracture is one of the most devastating injury in the elderly. Incidence of these fracture increase with advancing age due to the increased life expectancy of the people and osteoporosis [1][2][3][4][5] The mechanism of injury is mostly trivial trauma. Bergstrφm *et al*[6] found that low-energy trauma (fall<1 m) caused 53% of all fractures in persons 50 years of age and older. In those over 75 years, low-energy trauma caused>80% of all fractures. The contribution of osteoporosis-related fractures is more important than previously thought.

Stable fractures can be easily treated with osteosynthesis with predictable results. However, the management of unstable intertrochantric([7][8])fractures is a challenge because of difficulty in obtaining anatomical reduction.

In the past, fixed nail plate devices used for the fixation of these fractures had high rates of cut-out and fracture displacement [9][10][11]. Subsequently, a sliding hip screw was used with much success and became the predominant method of fixation of these fractures [12][13][14][15]. Complications such as head perforations, excessive sliding leading to shortening, plate pullout, and plate breakage continued to be a problem especially with the unstable type of fractures [16][17][18][19]. Osteoporosis and instability are one of the most important factors leading to unsatisfactory results [20][21][22] Also in these elderly patients with unstable osteoporotic fractures, a period of restricted mobilisation is suggested,[23] which may cause complications like atelectasis, bed sores, pneumonia, and deep vein thrombosis[24] [25]. Thus fracture stability, bone strength, and early rehabilitation determined the final results in cases of intertrochantric fractures.

In these patients treatment with primary cemented bipolar hemiarthroplasty could perhaps return the patients to their pre injury level of activity more quickly, thus obviating the post operative complications caused by immobilization or failure of the implant.

The purpose of the present study was to evaluate the results, technical problems with cemented bipolar hemi arthroplasty for comminuted, unstable, osteoporotic trochanteric fractures of the elderly.

AIM AND PLACE OF THE STUDY: The aim of this prospective study is to analyse the surgical results of primary cemented bipolar hemi arthroplasty in unstable trochanteric fractures of the elderly done in Government Dharmapuri Medical College, Dharmapuri, Tamil Nadu from May 2012 to July 2017

RADIOGRAPHIC AND OTHER IMAGING STUDIES

Standard radiographic examination includes AP of the Pelvis and an AP and cross table lateral view of the proximal femur.

The lateral radiograph can help to assess the posterior comminution of the proximal femur. An internal rotation view of the injured hip may be helpful to identify non displaced fractures. Internally rotating the involved femur 10 to 15 deg offsets the anteversion of the femoral neck and provides a true AP of the proximal femur .

MATERIALS AND METHODS:

This prospective study is to analysed in 12 patients.. six patients are males, remaining six are females. Among age distribution 5 patients between 51 years to 60 years. Five patients between 61 years to 70 years. Two patient between age of 71 to 80 years. Left side fractures in seven patients, right side in 5 patients. Osteoporotic assessment Singh's index of Grade I in seven patients, Grade II in four patients, Grade III in one patient. Quality of life of the patient before injury is categories as follows: among 12 patient 5 are Community ambulatory, seven patient are Household ambulatory , none of them is non ambulatory

Selection criteria:

Severe Osteoporosis
AO/ OTA Classification: Type A2, Type A3
Evan Classification: unstable Type I-Group III,IV
Boyd &Griffin Classification: Type 2

Exclusion criteria:

Stable fractures with intact lesser trochanter, Immobility /bedridden before injury, Associated injuries (such as another fracture which will impair early rehabilitation)

During study age of patient, mode of injury, associate co morbid condition, associated other injuries are considered.

Pre operative planning:

Radiographic examination includes AP view of the Pelvis and an AP and cross table lateral view of the proximal femur

Per operative evaluation:

During surgery operative blood loss, operative time are noted.

Surgical Approach: Moore approach
Prosthesis type : Bipolar prosthesis-cemented

SURGICAL PROCEDURE
PREPARATION OF PATIENT

On the day of the surgery, the skin is prepared using povidone iodine solution and covered with sterile clothes. Prophylactic antibiotic is given on the table. Inj.Ceftriaxone 1 gm given intra venously one hour prior to surgery

ANAESTHESIA USED AND POSITIONING:

Spinal anaesthesia is usually employed.

The patient is then positioned lateral or semiprone position according to surgeon's preference

POSTERIOR APPROACH (MOORE)

The patient is placed in the lateral position or semi prone on the unaffected side. The incision begins 10 cm distal to the posterior superior iliac spine, extends laterally to the greater trochanter and then distally along the lateral thigh. The fascia lata is divided over the greater trochanter and continued proximally and distally in the line of the skin incision. The fibers of gluteus maximus are separated by blunt dissection(Fig A), the posterior flap containing almost the entire muscle. Retracting this posterior flap and with further blunt dissection the sciatic nerve is identifiable in the depths of the incision. Stay sutures are placed through the tendons of piriformis and obturator internus and the short external rotators are divided close to their trochanteric insertions. While retracted posteriorly they serve as a soft tissue protection for the sciatic nerve. The capsule is incised posteriorly along the femoral neck. The hip may be dislocated by flexion, adduction and internal rotation.

PROCEDURE:

Through the above said approach, the fracture site is exposed. With the fracture fragments temporarily reduced, the neck of the femur is cut approximately 1 cm above the lesser trochanter (Fig B). If the fracture in the calcar fragment had extension beyond the lesser trochanter the fragment was stabilized partially using a cerclage wire or a bone reduction clamp when the femoral canal is reamed. The calcar of femur was reconstructed by either attach the lesser trochanter to femur with stainsteel wire or augmented with bone graft taken from neck of femur,placed in posteromedial aspect of neck of femur. The femoral stem was cemented in place using standard modern cementing techniques that include, lavage, cleaning, drying and plugging of the canal. Before cementation, one or two cerclage wires were placed around the large calcar fragment which also includes the lesser trochanter. Then cementation was done. The femoral stem was impacted gently into position until there was good bony coaptation at the inter trochanteric fracture line. Correct version of the femoral stem is identified by position of lesser trochanter or palpating the linea aspera or position of leg with knee in 90 degree of knee flexion (Fig C). Extreme care was taken to keep the tip of the wire passer on bone at all times to avoid injury to the sciatic nerve. The fractured greater trochanter with the abductor mechanism was stabilized with the main fragment by using 18 gauge cerclage wire, in a figure of 8 fashion (Fig D). The wound was closed in layers with a suction drain. The drain was removed at 48 hrs and the patient was made to walk with full weight bearing as tolerated, under the supervision of a physiotherapy team.

Post operative protocol

Intra venous antibiotic prophylaxis was given routinely to all patients at the time of induction of anaesthesia and are continued for 48 hours and then switched on to oral antibiotics till suture removal. Drain was removed after 48 hours. All the patients were allowed to stand and walk after removal of drain depending upon the patients tolerance to pain. No restriction was imposed during post operative mobilization of patient. In our study no routine DVT prophylaxis was given.

INTRA OPERATIVE PICTURE

Fig A :Posterior Approach

Fig B: Preparing proximal femur

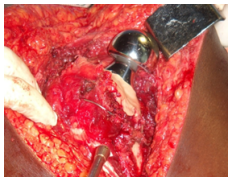

Fig C:Introduce prosthesis &

Fig D: After reducing the hip

reconstruction of abductor mech.

Follow up:

In our study the minimum follow up was 6 months and the maximum follow up was 14 months with a mean follow up of 8.9 months.

Follow up period : five patients of less than 6 month follow up. Six patients between 7 to 12 month follow up, one patient had more than 12 month follow up

The patients were reviewed regularly at 6 weeks interval for 3 months and later every 6 months. At the end of this study the patients were called back for review. At every visit the patients were assessed clinically using the Harris Hip Score.

OBSERVATION

Study was conducted at Government Dharmapuri Medical College, Dharmapuri, Tamil Nadu on 12 elderly osteoporotic patients with unstable inter trochanteric fractures from from May 2012 to July 2017. All the patients were treated with cemented Bipolar hemiarthroplasty.

The following observations are made in this study:

1. There was equal distribution in male & female.
2. In most of our patients left side (58%) was commonly affected.
3. The incidence of fracture was more common in the age group of 50 years-70 years. This shows those elderly age groups were more susceptible.
4. In most of the patients the Singh's index was Grade I (60%).
5. In majority of our patients the common pre existing co morbid conditions are Diabetes Mellitus (33%), Hypertension (25%) and Coronary Artery Disease (8%)

Complications

The following complications were noted in our study

1. Dislocation - 2 patients
2. Superficial infection - 2 patient
3. Shortening - 4 patients

1. Dislocation:

Of the two patients with dislocation one had dislocation in the immediate post operative period for which closed reduction under general anaesthesia done, which failed. For that revision total hip replacement done after doing adductor tenotomy.

The other patient had a trivial fall one and half month after surgery and came with dislocation of prosthesis, for that open reduction done and immobilization in derotation boot was done for 3 weeks.

Pt A, 62 years

Post operative dislocation

After open reduction

Pt B, 55/ M

Post op dislocation

After revision THR

2. Superficial infection: Two patient had superficial infection which subsided with antibiotics. There were no deep infections.

3. Shortening:

Four patients had shortening of about two centimeter, due to sinking of

the prosthesis. This was mainly due to severe osteoporosis. This can be prevented to some extent by reconstruction of the posteromedial fragments before reaming using bone grafting in postero medial aspect, cementing, cerclage wires.

RESULTS

This study was conducted at Government Dharmapuri Medical College, Dharmapuri, Tamil Nadu from on 12 elderly osteoporotic patients with unstable inter trochanteric fractures from May 2012 to July 2017. In our study all the patients were evaluated clinically using Harris Hip Score at various follow up period.

Table 1 : results of the study

	Result
Age	**61**
Follow up(months)	**8.9**
Operative time(min)	**84**
Blood loss(ml)	**285**
Harris hip score	**80**

Average age of patient 61 years, varies from 51 to 73 years. Operative time varies from 60 to 120 minutes with average of 84 minutes. Average blood loss of 285 ml (varies between 150ml to 450 ml). Average harris hip score of 80 varies from 25 to 102. Post operative dislocation of hip in 2 patient, one patient treated with open reduction, another patient treated with THR. Two patient had superficial infection which treated with parenteral antibiotics and 4 patient had <2cm of shortening. One patient expired which is not related to surgery.

Compare with ***Haentjens P, Casteleyn PP, De Boeck H, Handelberg F, Opdecam P. et al*** only 18 % of post ooperative dislocation, good Harris hip score of 80 in this study.

Patient Harris hip score is Excellent in 2 patients, good in 5 patients, fair, poor results in 2 patients each one patient dead during follow up.

Conclusion: Hemiarthroplasty for unstable osteoporotic intertroc hanteric fractures in elderly results in early ambulation and good functional results also cost effective, decreased hospitalization, improved nursing care and improved function.

Though the experience is short the results are encouraging.

REFERENCES

1. Kannus P, Parkkari J, Sievõnen H, Heinonen A, Vuori I, Jõrvinen M. Epidemiology of hip fractures. Bone 1996;18:57S-63S.
2. Koval KJ, Zuckerman JD. Hip fractures are an increasingly important public health problem. Clin Orthop Relat Res 1998;348:2
3. Rockwood PR, Horne JG, Cryer C. Hip fractures: A future epidemic? J Orthop Trauma 1990;4:388-93.
4. Frandsen PA, Kruse T. Hip fractures in the county of Funen, Denmark: Implications of demographic aging and changes in incidence rates. Acta Orthop Scand 1983;54:681-6
5. Hedlund R, Lindgren U. Trauma type, age, and gender as determinants of hip fracture. J Orthop Res 1987;5:242-6.
6. Evans EM. The treatment of trochanteric fractures of the femur. J Bone Joint Surg Am 1949;31:190-203.
7. Bannister GC, Gibson AG, Ackroyd CE, Newman JH. The fixation and prognosis of trochanteric fractures: A randomized prospective controlled trial. Clin Orthop Relat Res 1990;254:242-6.
8. Chinoy MA, Parker MJ. Fixed nail plates versus sliding hip systems for the treatment of trochanteric femoral fractures: A meta analysis of 14 studies. Injury 1999;30:157-63
9. Moller BN, Lucht U, Grymer F, Bartholdy NJ. Instability of trochanteric hip fractures following internal fixation: A radiographic comparison of the Richards sliding screw-plate and the McLaughlin nail-plate. Acta Orthop Scand 1984;55:517-20.
10. Flores LA, Harrington IJ, Martin H. The stability of intertrochanteric fractures treated with a sliding screw plate. J Bone Joint Surg Br 1990;72:37-40
11. Hall G, Ainscow DA. Comparison of nail-plate fixation and Ender's nailing for intertrochanteric fractures. J Bone Joint Surg Br 1981;63:24-8
12. Larsson S, Friberg S, Hansson LI. Trochanteric fractures: Mobility, complications, and mortality in 607 cases treated with the sliding-screw plate. Clin Orthop Relat Res 1990;260:232-41
13. Davis TR, Sher JL, Horsman A, Simpson M, Porter BB, Cheketts RG. Intertrochanteric femoral fractures: Mechanical failure after internal fixation. J Bone Joint Surg Br 1990;72:26-31.
14. Thomas AP. Dynamic hip screws that fail. Injury 1991;22:45-46
15. Kim WY, Han CH, Park JI, Kim JY. Failure of intertrochanteric fracture fixation with a dynamic hip screw in relation to pre-operative fracture stability and osteoporosis. Int Orthop 2001;25:360-2
16. Jensen JS, Tondevold E, Mossing N. Unstable trochanteric fractures treated with the sliding screw-plate system: A biomechanical study of unstable trochanteric fractures: III, Acta Orthop Scand 1978;49:392-7
17. Suriyajakyuthana W. Intertrochanteric fractures of the femur: results of treatment with 95 degrees Condylar Blade Plate. J Med Assoc Thai 2004;87:1431-8
18. Stern MB, Angerman A. Comminuted intertrochanteric fractures treated with a Leinbach prosthesis. Clin Orthop Relat Res 1987;218:75-80.
19. Tronzo RG. The use of an endoprosthesis for severely comminuted trochanteric fractures. Orthop Clin North Am 1974;5:679-81.
20. Parker MJ, Handoll HH. Replacement arthroplasty versus internal fixation for extracapsular hip fractures. Cochrane Database Syst Rev 2006;2:CD000086
21. Stern MB, Goldstein TB. The use of the Leinbach prosthesis in intertrochantric fractures of the hip. Clin Orthop Relat Res 1977;128:325-31
22. Liang YT, Tang PF, Guo YZ, Tao S, Zhang Q, Liang XD, et al. Clinical research of hemiprosthesis arthroplasty for the treatment of unstable intertrochanteric fractures in elderly patients. Zhonghua Yi Xue Za Zhi 2005;85:3260-2
23. Grimsrud C, Monzon RJ, Richman J, Ries MD. Cemented hip arthroplasty with a novel cerclage cable technique for unstable intertrochanteric hip fractures. J Arthroplast 2005;20:337-43.
24. Haentjens P, Casteleyn PP, De Boeck H, Handelberg F, Opdecam P. Treatment of unstable intertrochanteric and subtrochanteric fractures in elderly patients. Primary bipolar arthroplasty compared with internal fixation. J Bone Joint Surg Am 1989;71:1214-25
25. Stappaerts KH, Deldycke J, Broos PL, Staes FF, Rommens PM, Claes P. Treatment of unstable peritrochanteric fractures in elderly patients with a compression hip screw or with the Vandeputte (VDP) endoprosthesis: A prospective randomized study. J Orthop Trauma 1995;9:292-7.
26. Kesmezacar H, Ogut T, Bilgili MG, Gokay S, Tenekecioglu Y. Treatment of intertrochanteric femur fractures in elderly patients: internal fixation or hemiarthroplasty. Acta Orthop Traumatol Turc 2005;39:287-94
27. Kenzora JE, McArthy RE, Lowell JD, Sledge CB: Hip fracture mortality. Relation to age, treatment, pre operative illness, time of surgery and complications: Clin Orthop 186: 45 -56, 1984.