National Journal of Clinical Orthopaedics

ISSN (P): 2521-3466
ISSN (E): 2521-3474

www.orthoresearchjournal.com
2018; 2(1): 46-50
Received: 11-11-2017
Accepted: 15-12-2017

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Primary modular bipolar prosthetic replacement for unstable intertrochanteric fractures in elderly

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Abstract
Unstable intertrochanteric fracture in elderly is a challenging surgical condition with a high risk of morbidity and mortality. The aim of this study is to evaluate the functional outcome following primary modular bipolar prosthetic replacement for unstable intertrochanteric fractures in elderly.
Materials and Methods: A prospective Study of 46 patients were evaluated from tertiary hospital for a period of Dec 2014 to June 2017. 46patients (40 females and 6 males—all were 75 years old or above) who had bipolar arthroplasty for unstable intertrochanteric fractures were prospectively evaluated. Lateral approach was used in all patients. Harris Hip Score (HHS) used for functional evaluation, however radiological follow up was done using plain X-rays. Follow up period ranged from 6weeks to 30 months
Results: The Harris Hip Score were. 6 cases (12.5%) had excellent, 11(25%) had good, 23(50%) had fair and 6(12.5%) had poor results. In this study 5 cases had complications; like shortening in 2 patients, anterior thigh pain in 1 patients, decubitus ulcer in 1 patient, External rotation deformity in 1patient.
Conclusion: Primary modular bipolar prosthetic replacement is a viable option for treatment in a selected group of previously independently mobile elderly patients with unstable intertrochanteric fractures and osteoporosis. The patients rapid return to the pre fracture level of activity significantly reduced the incidence of complications related to immobilization early walking with full weight bearing is the major benefit and goal of the procedure.

Keywords: Bipolar**;** unstable intertrochanteric fractures; hemiarthroplasty; harris hip score

Introduction
Fractures of the proximal femur in elderly patients are generally caused by a single fall and is more common in elderly females [1]. Unstable intertrochanteric fractures in elderly constitute one of the major reasons for morbidity in this age group [2]. People in this age group usually have other systemic complications such as diabetes and cardiovascular diseases. The impacts of these diseases leads to a rapid deterioration in the general condition of these patients if they are kept bed ridden. The main goals for the treatment of these fractures in elderly patients are, to restore the pre-fracture activity status, to allow early full weight bearing and to avoid possible re-operation [3]. As a general rule, preservation of the patient's own bones is the ideal aim for the surgeons. In osteoporotic elderly patients with unstable intertrochanteric fracture this ideal aim will not bring the patient back his activity if internal fixation was done. Weak purchase of the internal fixation device due to osteoporosis and commination of the fracture increases the incidence of failure of internal fixation such as, cutting out the screws and displacement of the bone fragments [2]. We cannot rely on internal fixation devices to allow early full weight bearing of patient in presence of severe osteoporosis and marked comminution at the fracture site. Partial weight bearing is very difficult to be followed by these patients, so they shift to full weight bearing on the operated limb causing mechanical failure [2]. This prospective study was conducted to evaluate the results of bipolar arthroplasty for elderly patients with unstable intertrochanteric fractures.

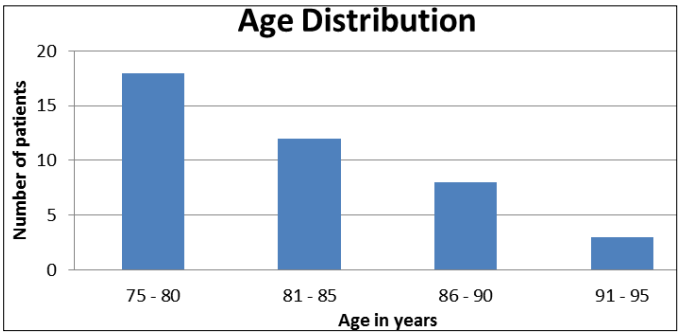
Aim of the study
To evaluate the functional outcome following primary modular bipolar prosthetic replacement for unstable intertrochanteric fractures in elderly.

Materials and Methods
A prospective Study of 46 patients were evaluated from tertiary hospital for a period of Dec

2014 to June 2017. Who got unstable intertrochanteric fractures. The inclusion criteria were: 1) Unstable intertrochanteric fractures, 2) Elderly patient (75 years or older), 3) Osteoporosis (Singh index from 4, 3, 2 & 1).

Age distribution

The age group ranged from 75 years to 95 years with an average of 83.4 years



Sex distribution

There were 6 (12.5%) males and40 (87.5%) females.

Etiological distribution

All the fractures caused by slip and fall. None were due to road traffic accident or high velocity injury.

Patients with evidence of bone softening disease, inflammatory arthropathy & who were non mobile pre-injury were excluded from the study. An operation of cemented bipolar hemiarthroplasty was performed for all of these patients. Follow up period ranged from 6 weeks to 30 months.

Implants

All 16 fractures were treated with primary modular bipolar cemented prosthetic replacement.

All patients received 3rd generation cephalosporin's as antibiotics, low molecular weight heparin (LMWH), morphine for analgesia and proton pump inhibitor for protection against stress ulcers. In addition to that, the following radiological assessment was performed: AP view for the pelvis and hips radiograph with the Patient lying flat on the table and the lower extremities internally rotated 15˚. Careful preoperative templating of appropriate radiographs helped in restoring hip biomechanics. As for the surgical approach, the lateral (Harding) approach was used for all patients (with the patients in the lateral position). Clinical follow up was done after 6 weeks of discharge then every 3, 6 and 12 months then every 6 months thereafter. Harris hip score was used for clinical evaluation. Results were rated as. 6 cases (12.5%) had excellent, 11(25%) had good, 23(50%) had fair and 6(12.5%) had poor results.

Results

The mean hospital stay period was 17.9 days (range 12 - 21 days). The mean intra-operative blood loss was 550 cc (range 350 - 850 cc) Post-operatively 14 cases were able to ambulate independently using walker. At last follow up, the Harris Hip score were 6 cases (12.5%) had excellent,11(25%)had good, 23(50%)had fair and 6(12.5%)had poor results. Poor results were noticed in 6 patients who had hemiparesis preoperatively.

Complications: In this study 5 cases had complications; like shortening in 2 patients, anterior thigh pain in 1 patients, decubitus ulcer in 1 patient external rotation deformity in 1patient.

Discussion

Several surgical options exist for the treatment of unstable intertrochanteric fractures. Traditionally, the consensus was to preserve the normal bone by open reduction and internal fixation. The technique is familiar to orthopaedic surgeons, and it is relatively rapid [4]. Arthroplasty is a less frequently employed alternative, although it allows immediate full weight bearing. Many of the complications of internal fixation (e.g. non-union) are avoided by performing arthroplasty [4]. Several studies have been published reporting the results of treatment using different techniques. Studies of internal fixation of both stable and unstable intertrochanteric hip fractures reported failure rate between 6% - 32% [2, 4-6]. Theoretically, bipolar hemiarthroplasties were introduced to address the complications of unipolar implants like acetabular wear, protrusion, loosening, and dislocation. Stems were reconfigured, more in line with total hip replacement designs, to lessen component loosening. Inner bearing motion was introduced to reduce acetabular wear and dislocation rates. Modularity allowed for sizing to improve stability [7]. In unstable intertrochanteric fractures management; the choice of bipolar hemiarthroplasty prosthesis raised a new question: which stem design should be used? The deficient proximal medial femur is one of the challenges faced during surgery. It is either to be augmented with cal- car replacement prosthesis, or the cal- car has to be reconstructed. Several investigations have reported a good to excellent functional results with the used of calcar replacement femoral prosthesis [4]. By comparing the results of this study with the results obtained by Faldini [5], Chris [4], Haentjens [2], Rady [6] and others it was found that: In this study the mean age group was 83.4 years. While in Faldini's, Chris's, Rady's and Haentjens's study, the mean age was 81, 80, 85.04 and 82 years old respectively. Hence, this study targeted the same age group as in other studies. The mean Harris Hip Score in this study: The Harris Hip Score were. 6 cases (12.5%) had excellent, 11 (25%)had good, 23(50%) had fair and 6 (12.5%) had poor results In comparison to our results in Haentjens's [2] series about 78% of the patients got excellent to good results. In Rady's [6] study (who used Merle d, Aubigne as a scoring system) about 63% of the patients got excellent to good results. One of the reasons that may affect the outcome of the operation is the time interval trauma to and surgery which was 3.2 days in this study, 2.81 days in Rady's [6] study, while in Faldini's [5] study all the patients were operated within the first 48 hours of the trauma resulting in 0% of dislocation, 0% of loosening or infection with mean HHS at 1 year was 76. We tried to shorten this time interval. About 41.46% of the patients had their operation delayed for preoperative workup and optimization due to other systemic diseases. We had no in- hospital mortality, however, In Haentjens's [2] study the 1 year mortality rate was 35%. This could be explained by the fact that the mean age in his study was 82 years, In Chris's [4] study the 1 year mortality age was 10.3% and the mean age was 80 years. In Rady's [6] study the one year mortality was 18.75% with the mean age being 85.04 years. In

Faldini's [5] study, despite the mean age being 81 years, the 1 year mortality was 19%. Furthermore, all the operations in Faldini's study were performed within 48 hours from the trauma. It may be that this time interval from the trauma till the operation may have an effect to get this mortality rate in this high age group. In different studies, the hospital mortality rate for unstable intertrochanteric fractures treated by open reduction and internal fixation ranged from 4% - 17% [2, 8-10]. In our series there were no cases of re-operation or infection. In Rady's study [6]; the rate of re-operation was 4.1%; 1 case for infection that necessitates implant removal and one case of dislocation which was managed by open reduction. There was no failure or re-operation in Faldini's study [5], however Haentjens's re-operated on 5.4% of the patients [2]. In this study the average blood loss was 550 cc. which was higher than the reported blood loss value in Faldini's study [5] (247 cc.) and in Chris's study (475 cc). Failure and re-operation which is highly dependent on the pre-fracture activity level. In Chris's study [4] there were 66.66% of the patients who were able to ambulate in-dependently; and they got improved over the next year (they were independent ambulant pre-fracture). Only 33.33% were able to walk with assistance and they didn't improve at 1 year follow up. All the patients in their study were ambulant postoperatively. In this study 40 cases were able to ambulate (pre-discharge) using walkers, only 6 cases poor results were noticed who had hemiparesis preoperatively and not able to walk independently with walker. In Chris's study [4], there were only one case of DVT and 2 cases of pressure sore for 2 patients who were not ambulant postoperatively.

Limitation of the study

1. It did not include a large number of patients,
2. Follow up period was relatively short. Potential long term problems associated with prosthetic replacement such as loosening, acetabular erosion, stem failure, late infection and late dislocation may yet occur.
3. Cost effectiveness of surgical intervention was not addressed.
4. A larger prospective randomized study is required [19].

Conclusion

Hemiarthroplasty using bipolar prostheses for the unstable intertrochanteric fractures of the femur in elderly has good clinical results; in terms of early post-operative ambulation [18]. This will have a direct effect on the general condition and the post-operative rehabilitation.

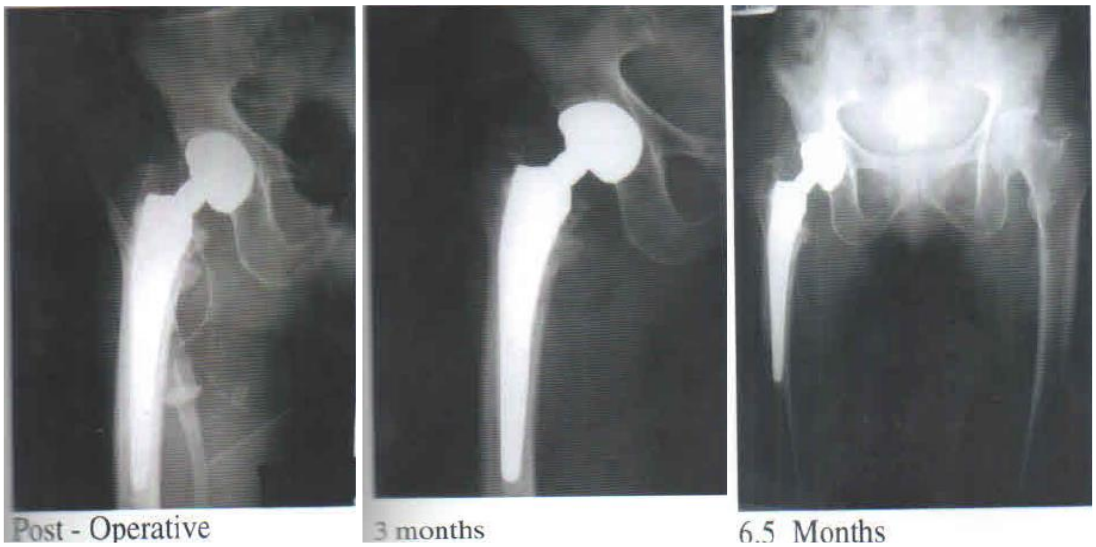
The patients rapid return to the Pre fracture level of activity significantly reduced the incidence of complications related to immobilization. Early walking with full weight bearing is the major benefit and goal of the procedure [18].

Patient selection is very important as we are directing this to the elderly people with sub-normal bone quality having unstable intertrochanteric fractures. So, bipolar hemiarthroplasty should be considered as one of the modalities of the treatment of unstable intertrochanteric fractures in elderly.

Illustration of cases

Patient no 13

Pre-operative



Patient no 32:

Pre-operative

Post-operative **6 weeks** **1 year**

References

1. Greenspain SI, Myers F, Maintland LA. Fall Severity and Bone Mineral Density as Risk Fractures for Hip Fracture in Ambulatory Elderly JAMA 1994; 271(2):128-133. Doi:10.1001/jama.1994.03510260060029
2. Haentjens P, Casteleyn PP, De Boek H, Handelberg F, Opdecam P. Treatment of Unstable Intertrochanteric and Subtrochanteric Fractures in Elderly. Primary Bipolar Arthroplasty Compared with Internal Fixation, Journal of Bone and Joint Surgery. 1989; 71(8):1214-1225.
3. Rodop O, Kiral A, Kaplan H, Akmaz I. Primary Bipolar Hemiprosthesis for Unstable Intertrochanteric Fractures, International Orthopaedics 2002; 26(4):233-237. DOI: 10.1007/s00264-002-0358-0
4. Grimsrud C, Monzon RJ, Richman J, Ries MD. Cemented Hip Arthroplasty with a Novel Cerclage Cable Technique for Unstable Intertrochanteric Hip Fractures, The Journal of Arthroplasty 2005; 20(3):337-343.
5. Faldini C, Grandi G, Romagnoli M, Pagkrati S, Digennaro V, Faldini O *et al*. Surgical Treat- ment of Unstable Intertrochanteric Fractures by Bipolar Hip Replacement or Total Hip Replacement in Elderly Osteoporotic Patients Journal of Orthopaedics and Traumatology 2006; 7(3):117-121. doi:10.1007/s10195-006-0133-x
6. Rady AE, Sharaf AA, Abuelela AA. Primary Bipolar Hemiarthroplasty in Unstable Intertrochanteric Fractures in Elderly, 24th SICOT Meeting International Society for Orthopaedic Surgery and Traumatology Cairo, 2003.
7. Wathne RA, Koval KJ, Aharonoff GB, Zukerman JD. Modular Unipolar versus Bipolar: A Prospective Evaluation of Functional Outcome after Femoral Neck Fracture, Journal of Orthopaedic Trauma. 1995; 9(4):298-302. DOI: 10.1097/00005131-199509040-00005
8. Kyle RF, Gustillo RB, Premer RF. Analysis of Six Hundered and Twenty Two Intertrochanteric Hip Fractutes, Journal of Bone & Joint Surgery. 1979; 61(2):216-221.
9. Hardy DCR, Descamps PY, Krallis P, Fabeck L, Smets P, Bertens CL e*t al*. Use of an Intramedullary Hip-Screw Compared with a Compression Hip-Screw with Plate for Intertrochanteric Femoral Fractures. A Prospective, Randomized Study of One Hundred Patients, Journal of Bone & Joint Surgery. 1998; 80(5):618-630.
10. Haidukewych GJT, Israel TA, Berry DJ *et al*. Reverse Obliquity Fractures of Intertrochanteric Region of the Femur, Journal of Bone & Joint Surgery. 2001; 83(5):643-650.
11. Harwin SF, Stern RE, Kulick RG. Primary bateman Leinbach Bipolar Prosthesis Replacement at the Hip in the

Treatment of Unstable Intertrochanteric Fractures in Elderly, Orthopaedics 1990; 13(10):1131-1136.
12. Green S, Moor T, Proano F. Bipolar Prosthesis Replacement for the Management of Unstable Intertrochanteric Hip Fractures in Elderly, Clinical Orthopaedics and Related Research 1987; 224:169-177.
13. Chan KC, Gill GS. Cemented Hemiarthroplasty for Elderly Patients with Intertrochanteric Fractures, Clinical Orthopaedics and Related Research 371:206-215. DOI: 1997/00003086-200002000-00025
14. Stern MB, Angerman A. Comminuted Intertrochanteric Fractures Treated with a Leinbach Prosthesis, Clinical Orthopaedics and Related Research, 1987, 218.
15. Kyle RF, Gustillo RB, Premer RF. Analysis of Six Hundered and Twenty Two Intertrochanteric Hip Fractutes, Journal of Bone & Joint Surgery. 1979; 61(2):216-221.
16. Hardy DCR, Descamps PY, Krallis P, Fabeck L, Smets P, Bertens CL, *et al*. Use of an Intramedullary Hip-Screw Compared with a Compression Hip-Screw with Plate for Intertrochanteric Femoral Fractures A Prospective, Randomized Study of One Hundred Patients, Journal of Bone & Joint Surgery. 1998; 80(5):618-630.
17. Haidukewych GJT, Israel TA, Berry DJ *et al*. Reverse obliquity fractures of intertrochanteric region of the Femur, Journal of Bone & Joint Surgery. 2001; 83(5):643-650.
18. Choudhari Pradeep, Agrawal Anuj, Gurjar Abhishek. Treatment of Comminuted Unstable Inter-Trochanteric Fracture in Elderly Patients with Cemented Bipolar Prosthesis Indian Journal of Orthopaedics Surgery. 2015; 1(4):255-260.
19. Sancheti KH, Sancheti PK, Shyam AK, Patil S, Dhariwal Q, Joshi R. Primary hemiarthroplasty for unstable osteoporotic intertrochanteric fractures in the elderly: A retrospective case series, Indian J Orthop. 2010; 44(4):428-434.