

Original Research Article

Functional Outcome of Cemented Hemi Arthroplasty in Unstable Intertrochanteric Fractures in Osteoporotic Bones in Elderly

Dr. Renjit Mathew Peter¹, Dr. Madhukar², Dr. Siva Sankar Reddy Konda¹, Dr. Mohamed Sajeed¹,
Dr. Duppala Manoj Kumar¹, Dr. A.Sivakumar³

¹Post Graduate, ²Associate Professor, ³Professor and Head, Department of Orthopaedics, Sree Balaji Medical College and Hospital, No. 7, Works Road, New Colony, Chromepet, Chennai- 600044, Tamilnadu, India

*Corresponding author

Dr. Renjit Mathew Peter

Email: eolrenjith@gmail.com

Abstract: Unstable osteoporotic intertrochanteric fractures in elderly pose a difficult problem in treatment. Most of the fixation devices are fraught with failures. Early mobilization is key to the success and prevention of complications and good functional outcome. Cemented hemiarthroplasty is a good choice in such patients. We treated 30 patients with cemented hemiarthroplasty and had good to excellent results as assessed by Harris hip score.

Keywords: Intertrochanteric fracture, Unstable, Osteoporosis, Functional outcome, Harris hip score, Cemented hemiarthroplasty

INTRODUCTION

Intertrochanteric fractures occur most commonly in elderly people aged more than 65 years mainly due to osteoporosis of bone in that age, is often associated with high mortality rates. The problem of osteoporotic bones are the geometry (usually grossly comminuted), high instability and difficult to treat with the most often used methods of internal fixation. The aim of the treatment is to make the patient weight bear immediately to prevent complications like bed sores, pulmonary dysfunction and eventually death due to recumbency due to deep vein thrombosis and pulmonary embolism associated with conservative treatment [1-6]. The physiological factors like age, osteoporosis and instability of the fractures are always overlooked [5]. Intertrochanteric fractures occur in transitional bone between femoral neck and shaft which is composed of both cortical and trabecular bone [3, 4]. It is composed of a strong calcar femorale which provides strong interphase to distribute the stresses of weight bearing [3, 4]. The treatment of the fracture depends upon stability, comminution, medial calcar, severity of osteoporosis. The options of the treatment include DHS and PFN in stable fractures, PFN in unstable fractures in young, uncemented arthroplasty in unstable fractures where calcar and lesser trochanter is intact and no comminution, cemented arthroplasty in cases where either calcar is fractured or instability of the posteromedial wall in elderly. DHS and PFN in osteoporotic fractures have shown high percentage of failures [7, 8]. Studies comparing bipolar arthroplasty

with internal fixation in elderly osteoporotic fractures have concluded that arthroplasty group had easier and faster rehabilitation [9].

MATERIALS AND METHODS

The study was a prospective study conducted in Sree Balaji Medical College And Hospital chromepet, Chennai between august 2014 to august 2016. We had 64 cases of intertrochanteric fractures in elderly of which 20 cases were stable and without osteoporosis treated by DHS or PFN. 14 were unstable fractures with osteoporosis of 4, 5 singh's index with intact calcar treated by uncemented hemi arthroplasty. Remaining 30 cases were included in our study which were treated by cemented hemi arthroplasty.

The patients were screened clinically and radiologically pre operatively for knowing the anatomy of fracture, any associated diseases like hypertension, diabetes, ischemic heart diseases etc. We included unstable, comminuted intertrochanteric fractures with severe osteoporosis of singh's index less than 4 in patients aged more than 65 years. The preinjury status must be ambulatory and patient must be cooperative for physiotherapy and willing for surgery. We excluded all patients with preinjury, non ambulatory patients, open fractures and severely moribund patients. Patients with singh's index more than 4 were excluded.

PRE OPERATIVE PROTOCOL

All the patients with intertrochanteric fractures were evaluated with xrays of pelvis with bilateral hip with proximal femur anteroposterior view. The fracture was assessed for stability using AO classification, the calcar, the lesser trochanter and posteromedial cortex was assessed. Osteoporosis was assessed with singh's index [10].

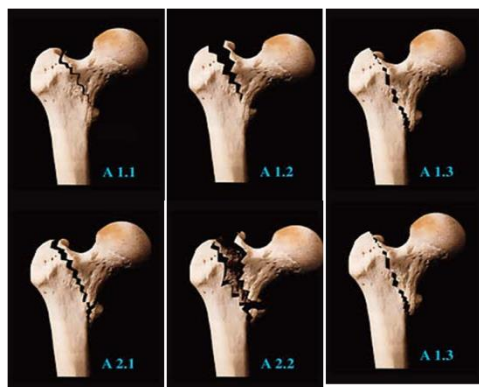


Fig-1: AO classification

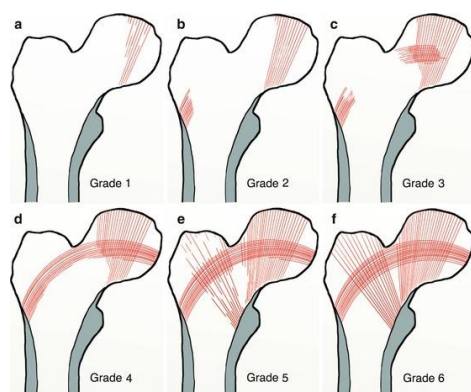


Fig-2: Singh's Index

Pre anaesthetic evaluation for fitness was carried out and patient was operated as soon as possible.

SURGICAL PROCEDURE

All surgeries were performed in elective theatre under strict aseptic precautions. Surgery was performed under spinal anesthesia or general anaesthesia. Antibiotics are given at the time of induction. Patient in lateral position either with posterior Moore or lateral approach hip joint is reached, Fracture site was identified and head extracted out using a cork screw. Size was measured using a template. The acetabulum was prepared by excising the ligaments teres. The medullary cavity was rasped using a broach and prepared for insertion of prosthesis. Appropriate implant was taken and cemented into femur. In case of comminution of greater trochanter, it was fixed using stainless steel wire and K wire. The head was reduced

into acetabulum. Stability was assessed. The capsule was closed, external rotators were sutured and wound was closed in layers with a number 16 suction drain in situ. Dressings were applied and an abduction pillow kept between the legs.

POST OPERATIVE MANAGEMENT

Lower limbs were kept in abduction. Hourly pulse rate, blood pressure and temperature were monitored for the first 24 hours. Whenever necessary, blood transfusion was given. Intramuscular analgesics were given as per patient's compliance. Intravenous antibiotics were given for a minimum of 5 days. The suction drain was removed after 48 hours and fresh dressings were applied. Check X-ray was taken. Patient was made to sit on second day, stand up with a support (walker) on the third day and was allowed to walk with support (walker) from fourth day onwards, depending on their pain tolerance. Sutures were removed on tenth day. Any complications like bed sore or infection was treated before discharging the patient. Patients were assessed at an interval of one week, six weeks, three months, and six months using Harris hip score [11].

RESULTS

We had patients aged between 71 to 88, with mean age 76.93 and standard deviation 4.690. There were 23(76.7%) of women and 7(23.3%) of men in our study. Left hip was involved in 13 patients(43.3%) and right hip in 17 patients(56.7%). The mechanism of injury was fall at home in 25 patients(83.3%) and RTA in 5(16.7) patients. There were 18(60%) A 2.1, 7(23.3%) A2.2, 3(10%) A2.3, 2(6.7%) A 3.1 patients according to AO classification. There were 13(43.3%) with singh's grade 2 and 17(56.7%) with singh's grade 3 osteoporosis. Thomson's prosthesis was used in 21(70%) and bipolar in 9(30%). There were 12(40%) patients who didn't had any co morbidities, bronchial asthma was seen in 2(6.7%), CAD in 3(10%), DM in 6(20%), HTN in 3(10%), 3(10%) had both DM and HTN, 1(3.3%) had both HTN and CAD. Period of hospital stay ranges between 15 to 26 days with mean stay 19.97 days and standard deviation 2.71. Time of delay for surgery ranges between 6 to 14 days with mean time of delay 9.90 days and standard deviation 2.25. Duration of surgery ranges between 40 to 65 minutes with mean duration 51.17 minutes and standard deviation 7.51 minutes. There were no complications in 22 (73.3%). 1 patient had bed sore, superficial infection in 3 and UTI in 4 patients. 4 patients were lost in follow up and for 26 patients Harris hip score were evaluated after 1 week, 6 weeks, 3 months and 6 months (Table 1). There were 22 patients with good results and 4 patients with excellent results after 6 months of follow up.

Table 1: Harris Hip Score At Follow Up

Outcome	After One week		After six Week		After Three month		After six month	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
Poor(<70 score)	26	100	8	30.8				
Fair(70-79)			18	69.2	6	23.1		
Good(80-89)					20	76.9	22	84.6
Excellent(90-100)							4	15.4
Total	26	100	26	100	26	100	26	100

DISCUSSION

The treatment of unstable osteoporotic intertrochanteric fracture in elderly patients is a challenging problem to the surgeon. There are several devices of internal fixation for intertrochanteric fractures but to use them in an osteoporotic fracture is fraught with failures. Early mobilisation and prevention of morbidity due to decubitus position is the most important goal of treating these patients. For this reason cemented hemi arthroplasty in such cases remains the best option of treatment [12,13]. Cemented hemi arthroplasty provides adequate fixation early mobilisation and good prognosis with a good functional outcome and prevention of complications such as pressure sores, pneumonia, atelectasis, deep vein thrombosis and pseudo arthrosis. Reconstruction of the greater trochanter and calcar is an important step to maintain joint stability. In our series we had treated 30 patients and evaluated them with Harris hip score at follow ups.

According to Harris Hip scoring system, a score of more than 90 indicates excellent result, a score between 80 and 90 indicates good result, a score between 70 and 80 indicates fair result and a score

below 70 indicates poor result. In this study at one week all patients had poor results. After 6 weeks, 69.2 percent patients had fair results and 30.8 percent patients had poor results. After 3 months, 76.9 percent patients had good results and 23.1 percent patients had fair results. After 6 months follow up, 84.6 percent patients had good results and 15.4 percent patients had excellent results. Thus a progressive increase in Harris hip scores was noticed during the follow up period. The final outcome in our series was good to excellent in all the patients.

CONCLUSIONS

Cemented Hemi arthroplasty provides good functional result and prevention of complication in patients with unstable osteoporotic intertrochanteric fractures with an added advantage of early ambulation and reduced hospital stay. Cement (methyl-methacrylate) is a better fixing agent and it improves the stability of hip. The Thompson’s prosthesis is a better choice when there is fractured calcar or in case when calcar reconstruction is not possible by any way. The modular type of bipolar prosthesis is a better choice when there is comminution of postero-medial wall with lesser trochanter and calcar fracture.

CASE ILLUSTRATIONS

Case 1



Case 2



REFERENCES

1. Canale S, Beaty J. Campbell's operative orthopaedics, 11th ed. Fractures and Dislocations of the Hip. Philadelphia: Mosby Elsevier. 2007.
2. McKibbin B. The biology of fracture healing in long bones. *J Bone Joint Surg Br.* 1978;60:150-62.
3. Koval KJ, Zuckerman JD. Hip fractures: II. Evaluation and treatment of intertrochanteric fractures. *J Am Acad Orthop Surg.* 1994;2:150-6.
4. Kasser JR. Orthopaedic knowledge update 5— home study syllabus. Rosemont (IL): American Academy of Orthopaedic Surgeons. 1996.
5. Dimon J, Hughston. Unstable intertrochanteric fractures of hip. *J Bone Joint Surg Am.* 1967;49:440-50.
6. Zhang B, Chui KY, Wang M. Hip arthroplasty for failed internal fixation of intertrochanteric fractures. *J Arthroplasty.* 2004;19:329-33.
7. Evans EM. The treatment of trochanteric fractures of femur. *J Bone Joint Surg Am.* 1949;31:190-203.
8. Kim WY, Han CH, Kim JY. Failure of intertrochanteric fracture fixation with dynamic hip screw in relation to pre-operative fracture stability and osteoporosis. *Int Orthop.* 2001;25:360-2.
9. Haentjens P, Casteleyn P, 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;71:1214-55.
10. Singh M, Nagrath AR, Maini PS. Changes in trabecular pattern of the upper end of the femur as an index of osteoporosis. *J Bone Joint Surg Am.* 1970;52:457-67.
11. Harris H. Harris hip score. *J Bone Joint Surg Am.* 1969;51: 737-55.
12. Baumgaertner MR, Levy RN. Intertrochanteric hip fracture. In: Browner BD, Levine AM, Jupiter JB, editors. *Skeletal Trauma.* Vol 2. Philadelphia: W B Saunders. 1992;1833-81.
13. Haentjens P, Casteleyn PP, Opdecam P. The Vidal-Goalard megaprosthesis: An alternative to conventional techniques in selected cases? *Acta Orthop Belg.* 1985;51:221-34.