The Outcome of Coxofemoral Bypass Using Cemented Bipolar Hemiarthroplasty in the Treatment of Unstable Intertrochanteric Fracture of Femur in a Rural Setup

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ABSTRACT

Introduction: Unstable intertrochanteric fractures or comminuted intertrochanteric fractures not only pose a greater dilemma in the modality of treatment but also the prognosis. Increased incidence of osteoporosis in this age group, only further complicates fracture management and to that end the outcome. Overemphasis cannot be made on the need for immediate mobilization to avoid serious complications. There are multiple treatment options but only a few have the ability of immediate mobilization of the patient.

Aims: To study the benefits of coxofemoral bypass using cemented bipolar hemiarthroplasty in the treatment of unstable intertrochanteric fracture of the femur for early mobilization and reduction in morbidity in the elderly population.

Materials and Methods: The present cross-sectional study was carried out in the department of orthopaedics at Rural Medical College. 56 cases of unstable intertrochanteric fractures treated by coxofemoral bypass using a cemented bipolar hemiarthroplasty were selected for the study. The patient undergoing this procedure from 1/05/2015 to 31/04/2020 were selected for the present study.

Results: Final results were calculated using Harris-Hip Score. Out of 56 cases, 46.4% of cases had excellent and 35.7% and 8.9% of patients had good and fair results respectively.

Conclusion: Coxofemoral bypass using cemented bipolar hemiarthroplasty is a good treatment option for elderly patients with unstable intertrochanteric fractures showing significant reduction in morbidity and improvement in the early mobilization of patients. Coxofemoral bypass using cemented bipolar hemiarthroplasty in unstable intertrochanteric fractures of the femur has an added advantage of stable adequate fixation with early return of activities of daily living thereby reducing patient morbidity and long-standing complications of immobility.

Key Words: Coxofemoralbypass, Femur, Harris-Hip score, Hemiarthroplasty, Intertrochanteric fractures, Unstable

INTRODUCTION

Intertrochanteric fractures comprise one of the most common fractures encountered in the practice of an orthopaedic surgeon, mainly due to the rise of the geriatric population.¹ These fractures have a high rate of morbidity, accounting for almost 5% to 20% mortality in one year.¹ The mortality associated with hip fractures was observed to be connected to the age and gender of the patient and the associated nature and number of diseases.²

It is always important before reduction about distinguishing between stable and unstable intertrochanteric fractures.

Unstable intertrochanteric fractures or comminuted intertrochanteric fractures not only pose a greater dilemma in the modality of treatment but also in the prognosis and had a failure rate of more than 50%.³ With cortical instability on one side of the fractures happening due to cortical overlap or destruction; the fracture tends to collapse in the direction of the instability. In some cases, an unstable fracture may be missed due to an inadequate lateral radiograph, and might

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interfere with size, posteromedial comminution, and presence of the coronal split in the greater trochanteric 4 part fractures; the dreaded complication of unstable intertrochanteric fracture being the migration of femoral head into varus and retroversion. Increased incidence of osteoporosis in this age group, only further complicates fracture management and to that end, the final outcome.⁴ Further patients in a rural setup choose to keep the patient immobilized without treatment and opt for conservative management as they are unsure about the results of intramedullary nailing in the unstable intertrochanteric fractures of femur thereby adding to increased morbidity and mortality of the patient as a consequence of being bedridden. Patients with unstable intertrochanteric fractures need mobilization at the earliest to avoid complications related to immobility.⁵ Using cemented bipolar hemiarthroplasty in unstable intertrochanteric fractures of the femur has the additional advantage of adequate tight-fitting fixation with early return of activities of daily living thereby reducing patient morbidity and long-standing complications of immobility.⁵

As it is always important to emphasize the need for immediate mobilization to avoid serious complications; there are multiple treatment options but only a few have the ability of immediate mobilization of the patient coxofemoral bypass using cemented hemiarthroplasty being one of them.

MATERIALS & METHODS

The present cross-sectional study was carried out in the department of orthopaedics at Rural Medical College.

The study was carried out after the approval from Institutional Ethics Committee with Registration No. DR/RMC/UG PG/2019/157

56 cases of unstable intertrochanteric fractures treated by coxofemoral bypass using a cemented bipolar hemiarthroplasty were selected for the study. The patient undergoing this procedure was between 1st May 2015 to 31st April 2020 were studied.

Inclusion Criteria:

Age group 60 – 100 years.

Unstable intertrochanteric fractures (Evan's type III & IV)

Patients were willing to give consent and undergo coxofemoral bypass for fixation of unstable intertrochanteric fractures.

Exclusion Criteria:

Patients with polytrauma

Medically unfit

Patients not giving consent

Pathological fractures

Patients lost to follow up

Written consent was obtained from all the willing participants (patients with unstable intertrochanteric fractures of the femur) before the start of the study.

Data comprising of demographic parameters like Name, Age (Years), Height (Foot), Weight (Kg) were obtained and recorded from all participants. Special emphasis was given to findings suggestive of unstable intertrochanteric fractures of the femur.

On admission, a brief history was elicited to document the mechanism of injury. The clinical examination followed by haematological and investigations were done for all patients. The radiological investigation included the anteroposterior of the pelvis and lateral views of the affected hip.

Final results were calculated using Harris- Hip score with 46.4% cases as excellent and good while 8.9 % had fair results respectively (Table 1).

DATA ANALYSIS

Statistical analyses were done using Harris- Hip score with 91-100 being excellent, 81-90 being good, 71-80 being fair, and <70 being a poor outcome (Table 1).

RESULTS

The mean age was observed to be 79 yrs. The majority of the patients were in the 80 to 90 years of age group. Males comprised 46 % (Table 3). The right side (Table 2) was predominantly involved. The average blood loss was approximately 400ml. The average duration of hospital stay was 5 days. Final results were calculated using Harris- Hip score with 46.4% cases as excellent and good while 8.9 % had fair results respectively (Table 1). Figure 1 shows Harris- Hip score. Figure 2 shows intraoperative exposure during the surgery. Figure 3 shows the immediate postoperative radiograph of the surgical procedure.

DISCUSSION

Early mobilization plays an important role in the prevention of long term complications leading to the rise in the mortality rate in the geriatric population where the fracture is commonly seen. Osteosynthesis has produced excellent results in the treatment of these fractures but the presence of posteromedial comminution has led to problems such as inadequate fixation, failure of fixation.^{6,7} Osteoporotic bones have poor purchase of implant. Thus the treatment of unstable intertrochanteric fractures is constantly evolving from osteosynthesis to replacement.

Performing replacement surgery primarily helps in early recovery to a pre-fractured state with the advantages being secured fixation and preventing serious complications. Few studies have demonstrated the application of primary replacement in a rural Indian setup.^{8,9}

Early return to pre-fractured state and ambulation were stated as a definitive advantage by Stern and Goldstein in their series of 22 patients with intertrochanteric fractures treated using Leinbach prosthesis.¹⁰

Liang et al.¹, in their study, concluded that hemi prosthesis was an effective modality that decreased the morbidity, mortality and the cumulative financial burden of the patient's family.

Grimsrud et al.¹² treated many patients with unstable intertrochanteric fracture of the femur with cemented bipolar hemiarthroplasty. He observed that standard femoral stem can be combined with cerclage wires. They concluded that this technique permitted early weight-bearing with a relatively lower rate of complications.

Rodopet et al.¹³ in a study of 54 patients had 17 (45%) excellent and 14 (37%) good results respectively at the end of 12 months, using the Harris hip scoring system. Thus, this treatment modality had more promising results, especially when compared with the variable outcomes of osteosynthesis.

K. H. Sancheti et al.¹⁴ in a retrospective analysis of 37 cases had excellent to fair results in 31 of 35 patients and poor results in 2 patients concerning the Harris Hip Score. 2 patients died due to unrelated causes and were excluded from the study.

In a study Broos et al.¹⁵ stated that the patients with hemiarthroplasty (73%) had less pain post-operatively than those with internal fixation (63%).

Jalaluddin, Mahin Vaidyar, Sandeep Shibli, U. Hashir Safwan, Shabir Kassim observed better results in the hemiarthroplasty group in terms of early mobilization and limping and limitation to movements as compared to preoperative state.¹⁶

The benefits of primary replacement outweigh the disadvantages and risks associated.

CONCLUSION

Coxofemoral bypass using cemented bipolar hemiarthroplasty is a good treatment option for elderly patients with unstable intertrochanteric fractures showing significant reduction in morbidity and improvement in the early mobilization of patients. Coxofemoral bypass using cemented bipolar hemiarthroplasty in unstable intertrochanteric fractures of the femur has an added advantage of stable adequate fixation

with early return of activities of daily living thereby reducing patient morbidity and long-standing complications of immobility.

ETHICAL APPROVAL

The study was carried out after the approval from Institutional Ethics Committee with Registration No. DR/RMC/UG PG/2019/157

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Dr. Amol Sanap: substantial contributions and conceptions of design

Dr. Swapnil Shendge: acquisition, analysis of data

Dr. Siddharth Shah: interpretation of data, drafting of the manuscript

Dr. Nitin Ghule: revising of the manuscript for intellectual content

REFERENCES

1. Eiskjaer S, Otsgard SE, Jakobsen BW, Jensen J, Lucht U. Years of potential life lost after hip fracture among postmenopausal women. *Acta Orthop Scand.* 1992;63(3):293–296.
2. Dahl E. Mortality and life expectancy after hip fractures. *Acta Orthop Scand.* 1980;51(1):163–170.
3. Kim WY, Han CH, Park JI, Kim JY. Failure of intertrochanteric fracture fixation with a dynamic hip screw about preoperative fracture stability and osteoporosis. *Int Orthop.* 2001;25:360–2.
4. Larsson S. Treatment of osteoporotic fractures. *Scand J Surg.* 2002;91:140–6.
5. 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.
6. Kyle RF, Cabanela ME, Russell TA, Swiontkowski MF, Winquist RA, Zuckerman JD, et al. Fractures of the proximal part of the femur. *Instr Course Lect.* 1995;44:227–53.

7. Haidukewych GJ, Israel TA, Berry DJ. Reverse obliquity fractures of the intertrochanteric region of the femur. *J Bone Joint Surg Am.* 2001;83:643-50.
8. Haentjens P, Casteleyn PP, DeBoeck H. Treatment of unstable intertrochanteric and subtrochanteric fractures in elderly patients: primary bipolar arthroplasty compared with internal fixation. *J Bone Joint Surg* 1989; 71A: 1214-1255.
9. Stern MB, Angerman A. Comminuted intertrochanteric fractures treated with a Leinbach prosthesis. *Clin Orthop Relat Res.* 1987;218:75-80.
10. Babhulkar SS. Management of trochanteric fractures. *Indian J Orthop.* 2006;40:210-8.
11. Liang YT, Tang PF, Guo YZ, Tao S, Zhang Q, Liang XD, et al. Clinical research of hemi-prosthesis arthroplasty for the treatment of unstable intertrochanteric fractures in elderly patients. *Zhonghua Yi Xue Za Zhi.* 2005;85:3260-2.
12. 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.
13. Rodop O., Kiral, A., Kaplan, H. Primary bipolar hemi-prosthesis for unstable intertrochanteric fractures. *International Orthopaedics(SICOT)* 26, 233-237 (2002).
14. Sancheti, K.H., Sancheti, P.K., Shyam, A.K. Primary hemiarthroplasty for unstable osteoporotic intertrochanteric fractures in the elderly: A retrospective case series. *IJO044*, 428-434 (2010)
15. Broos PL, Rommens PM, Deleyn PR (1991) Pertrochanteric fractures in the elderly: are there indications for primary prosthetic replacement? *J Orthop Trauma* 5:446-451
16. Jalaludeen Mahin V, Sandeep S, U. Hashir S, Shabir K. Functional and radiological outcome of uncemented bipolar arthroplasty in unstable intertrochanteric fractures of elderly. *IJCRR* 2015 vol 7, 36-37.

Table 1: Interpretation of Harris- Hip score in terms of outcome for the patients.

Score	No. of cases	Percentage
91-100 (excellent)	26	46.4%
81-90 (good)	20	35.7%
71-80 (fair)	05	8.9%
<70 (poor)	05	8.9%
Total	56	

Variable	Points
Pain	
None or ignores it	44
Slight, occasional	40
Mild pain, rarely moderate	30
Moderate pain	20
Marked pain	10
Totally disabled, pain in bed	0
Function	
Limp	
None	11
Slight	8
Moderate	5
Severe	0
Support	
None	11
Cane, long walks	7
Cane, most of the time	5
One crutch	3
Two canes	2
Two crutches	0
Not able to walk	0
Distance walked	
Unlimited	11
Six blocks	8
Two to three blocks	5
Indoors only	2
Bed and chair	0
Stairs	
Normally without railing	4
Normally with railing	2
In any manner	1
Unable to do	0
Shoes and socks	
With ease	4
With difficulty	2
Unable	0
Sitting	
Ordinary chair for 1 h	5
High chair for 1 h	3
Unable to sit in any chair	0
Public transport	
Able to use	1
Unable to use	0

Figure 1: Harris- Hip score.

Table 2: Comparison between the sides operated in the patients.

Side operated	
Right	34
Left	22
Total	56

Table 3: Comparison between the genders having unstable intertrochanteric fractures of femur.

Gender	
Male	26
Female	30
Total	56

Figure 2: Intraoperative exposure.

Figure 3: Immediate postoperative radiograph.