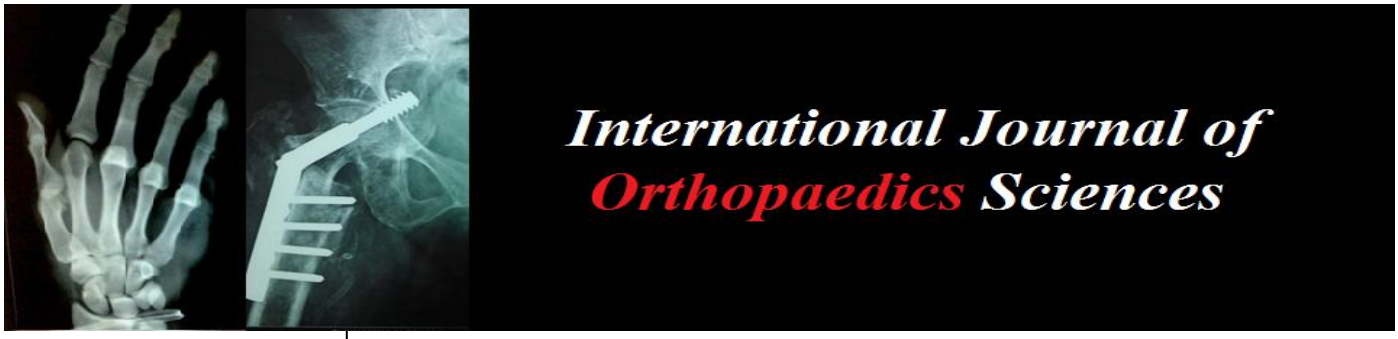

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Study of intertrochenteric fracture treated by bipolar hip replacement

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Abstract
Introduction: Unstable intertrochanteric fractures in osteoporotic bones are difficult to treat. Conservative treatment with traction and prolonged immobilization lands up with many complications and often fatality. Rate of failure in internal fixation, with dynamic hip screws or intramedullary nail has been found high, especially in osteoporotic bones. The weak and porotic bone tolerates screws poorly so cut out is the major problem in internal fixation. The purpose of this study was to determine whether hemiarthroplasty is a reasonable alternative method of treatment for elderly patients in intertrochanteric fracture with osteoporosis to reduce mortality and morbidity in terms of full weight bearing and complications related to prolonged bed rest.
Material and methods: 15 patients (6 males and 9 females) above 60 years of age with unstable intertrochanteric fractures who underwent bipolar arthroplasty were prospectively evaluated. Transtrochanteric approach was used in all patients. Greater trochanter tension band wiring was done in some patients. Harris hip score was used for the clinical evaluation. The minimum follow up period was one year.
Results: In our study 15 cases were taken, which had a mean age 75years. The mean Harris hip score at one year was 85. Excellent to good results were obtained at one year in 12 cases and fair in 2 cases, poor in 1. Death of two patients occurs due to age related factors. There was one case of superficial infection. Radiological follow-up showed no case with loosening of the prosthesis, break in the cement or sinking of the prosthesis.
Conclusion: In conclusion we state that hemireplacement arthroplasty is a valid treatment option for mobile and mentally healthy patients. This procedure offers quick recovery with little risk of mechanical failure, avoids the risks associated with internal fixation and enables the patients to maintain a good level of function beginning in the immediate post-operative period. But the follow up period in our study is not enough to make any clinical recommendations though it can serve as a critical analysis to stimulate future research. Further long-term studies are required.

Keywords: Intertrochenteric, fracture, bipolar, osteoporotic

Introduction
Intertrochanteric fractures involve those occurring in the region extending from the extracapsular basilar neck region to the region along the lesser trochanter proximal to the development of medullary canal. Gallagher *et al.* suggested that, with increase in the life expectancy, the incidence of Intertrochanteric fractures has sharply risen among the geriatric population.
Traditionally trochanteric fractures are treated by open reduction & internal fixation without considering significance of fracture type, age of the patient or associated co-morbidities. Standard internal fixation devices used in elderly patients with trochanteric fractures, have a high rate of complications as Baumgaertner *et al.* found 20% of implant failure in trochanteric fractures. Prolonged Immobilisation in old age patient causes complication related to bed rest. Elderly patients often are unable to cooperate with partial weight bearing, or if allowed full weight bearing, voluntarily limit loading of the injured limb. To allow immediate postoperative full weight bearing and to avoid excessive collapse at the fracture site, some surgeons recommended prosthetic replacements for unstable intertrochanteric fracture
Treatment with primary hemiarthroplasty rather than internal fixation could perhaps results in early recovery of these patient to pre injury levels in terms of mobility.

The complication related to prolonged bed rest can be minimised. Prosthetic replacement also shown to achieve early rehabilitation of these patient. Prosthetic replacement offers advantage of rapid return of function with pain free stable hip with 4%-5% need of revision surgery as compared to 30%-40% with traditional internal fixation [17].

Material and methods

15 patients underwent cemented bipolar hemiarthroplasty between September 2018 to September 2019 who had sustained comminuted inter-trochanteric fractures in osteoporotic bones. All patients who were operated by primary author by trans trochanteric approach. We selected this approach as in all our cases greater trochanter and lateral wall was fractured so in all cases femoral head was approached through the fracture site.

Inclusion criteria

1. Patients with age group >60yrs of either sexes.
2. Patients having fresh (Within 3 weeks) intertrochanteric fracture.
3. Patients with Boyd and griffin's type ii and Evan's type II & III.
4. Patients with Tronzo Type II & III.

Exclusion criteria

1. Age <60years
2. Patient with subtrochanteric extension.
3. Patient having undisplaced intertrochanteric fracture.
4. Patients with TRONZO TYPE IV & V and EVAN'S TYPE IV & V.
5. Failed implant with infection.
6. Patient having contraindication for hip prosthesis

Surgical procedure

All surgeries were performed using standard aseptic precautions. Surgeries were performed under hypotensive epidural anesthesia. Intravenous antibiotic were given 1 hr. prior to surgery. Position of the patient & draping. Straight lateral position with the patient lying on the unaffected side. Lateral skin incision: straight incision was taken centered over greater trochanter. Hip joint was exposed with Moore's approach. Fractured femoral head with neck was extracted by flexion & external rotation at hip joint, preserving the greater & lesser trochanter attached to the soft tissues. Head size measured. We prepared femoral medullary canal by sequential broaches in flexed & externally rotated hip. Trial implants were placed & hip was reduced to decide the final implants sizes. After removing the trial implants thorough wash given with pulse lavage. Cement restrictor was placed in the medullary canal 2 centimeters below the tip of femoral stem. Canal was dried using hydrogen peroxide soaked roller gauze. Cementing was done with cement gun. Placement of femoral stem was done. Hip joint was reduced & closure done in layers using negative suction drains. Trochanteric fixation was done with Tension Bend Wiring or encirclage using S.S. wire loop in figure of eight depending upon anatomy of greater trochanter fracture.

Rehabilitation

All the patients operated, were started with physiotherapy. All patients were trained for quadriceps strengthening exercises immediately. Full weight bearing walking was started from post-op day 1 with the help of walker for first 6 weeks post-operative. Thereafter patients started full weight bearing with support of a stick. Patients were instructed to avoid activities involving squatting and cross legged sitting for the rest of their life as a precautionary measure to avoid dislocation of the bipolar hemiarthroplasty. Patients were followed up regularly at 4 weeks, 8 weeks, 3 months and one year post-operatively.

Results

Patients were evaluated, every months post-operatively and then at final follow up using Harris Hip score. We had 15 patients included in our study with 9 female and 6 male patients. 14 patients had suffered the injury due to trivial trauma like fall from chair/bed, slip in bathroom or in house on floor. Rest 1 patient had suffered from road traffic accident.

Table 1: Age Distribution

Age distribution	No. of Patient
60-70	4
70-80	7
80-90	3
90-100	1

Table 2: Associated Medical Illness

Comorbidities	No. of Patient
None	8
Anemia	2
Diabetes mellitus + hypertension	1
Hypertension	2
COPD + hypertension	2

Table 3: Per operative factors

Mean operative time	91 min (70-120 min)
Blood loss	280ml (200-450 ml)
Post op drainage	110ml(10-200 ml)

Table 4: Post op complication

Post op complication	No. of Patient
Infection	1
Dislocation	0
Limb lengthening	3

Table 5: Results

Harris hip score	Number of patients
Excellent	1
Good	11
Fair	2
Poor	1

Fig 1: PRE-OP

Fig 2: POST-OP

Discussion

A wide range of technique is available for the treatment of

unstable comminuted intertrochanteric fracture in elderly osteoporotic patients.

Using internal fixation devices high rates of local and general complication have been reported. The general complication related to prolonged bed rest such as pulmonary metabolism, DVT, Pneumonia, bed score caused high rates of morbidity and mortality.

The earliest comparison of internal fixation and hemiarthropathy were done by Haentjens *et al*. [32] showing significant reduction in incidence of pneumonia and bed sore in those undergoing prosthesis replacement.

Primary hemiarthroplasty offers a modality of treatment that provided adequate fixation and early mobilization in these patients and hence preventing the post-operative complications related to prolonged best rest. Moreover, elderly patients, who are often unable to co-operate with partial weight bearing required after an internal fixation accept full weight bearing more easily. In present series 3 patients had limb lengthening (0.5-1.5 cm) without any effect on final functional outcome. It may be difficult to get the exact same leg lengths. The result was usually a longer leg on the surgical hip. It may be unavoidable and deliberate in order to improvemuscle function or stabilize the hip. If there is more than a quarter of an inch difference, a shoe lift may be necessary.

In our study only 2 patients out of the 15 died (13%) within 6 months of surgery due to unrelated causes.

Harris hip score at 1 month was 79, at 4 month was 83, and at 1 year was 85. All patients shows good results on short term follow up.

Conclusion

In conclusion we state that hemireplacement arthroplasty is a valid treatment option for mobile and mentally healthy patients. This procedure offers quick recovery with little risk of mechanical failure, avoids the risks associated with internal fixation and enables the patients to maintain a good level of function beginning in the immediate post operative period. But the follow up period in our study is not enough to make any clinical recommendations though it can serve as a critical analysis to stimulate future research. Further long term studies are required.

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