

Is It Worthy To Replace Hip Than To Go For Intramedullary Osteosynthesis In Unstable Intertrochanteric Fractures In Elderly- A Prospective Comparative Study

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Abstract

Background: Internal fixation for the management of unstable intertrochanteric femoral fractures in elderly is difficult and less successful due to comminution and poor bone stock. Arthroplasty for unstable intertrochanteric fracture in elderly has produced promising results as per literature. So, we conducted this study to compare the results of intramedullary devices with cemented bipolar hemiarthroplasty in unstable osteoporotic intertrochanteric fractures in elderly patients.

Material & methods: 51 patients, 65 years or older with unstable osteoporotic intertrochanteric femoral fractures were treated with internal fixation or hemiarthroplasty. Intraoperative parameters and functional outcome as per Harris Hip Score were compared.

Results: Average age of patients for intramedullary fixation and arthroplasty was 73 ± 6 years and 75 ± 6.5 years respectively. Average delay in surgery for group A (PFN) and group B (hemiarthroplasty) was 5.7 days and 6.56 days, mean duration of surgery was 75 min (range 45 to 125) and 95 min (range 70 to 132), mean blood loss was 180ml (range 150 to 280) and 270 ml (range 250 to 420) respectively. Harris hip score at one year were better in arthroplasty group but almost comparable at two year.

Conclusion: Primary arthroplasty provides a stable, painless and reasonably functional joint, which provided early mobility and rehabilitation and hence is a better way of managing an osteoporotic unstable intertrochanteric fracture in elders especially. However, overall long term functional outcomes are almost similar for two groups.

Keywords: Intertrochanteric fracture, Internal fixation, Arthroplasty, Harris Hip Score

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Introduction

Incidence of intertrochanteric (IT) fracture, which is common in elderly population, is increasing due to the improved healthcare facilities and life expectancy [1,2]. Stable intertrochanteric fractures can be adequately managed by osteosynthesis i.e. internal fixation and early rehabilitation with reasonably good results [3]. But osteoporosis (as common in elderly) and unstable IT (lateral blow out, subtrochanteric,

comminuted) fractures are two of the most important variables leading to poor functional outcome [4-6].

Management of these unstable intertrochanteric fractures is controversial and challenging because of poor bone stock, osteoporosis and other underlying comorbid conditions [4]. Although, osteosynthesis with help of fixed nail plate, trochanteric stabilizing plate with dynamic hip screw (TSP with DHS) or proximal intramedullary interlocking nail

(PFN) is described for these unstable fractures, but none of them ensures absolute fracture stability and complete bone union in elderly patients [4-7]. Reasons are many like, in comminuted fractures stabilization and fixation of all pieces is not possible, PFN not very appropriate for Indian population because of anthropometric variations of proximal femur, difficulty in placement of femoral neck screws at correct position and the most importantly, all these fixation require prolonged immobilization specially in osteoporotic bones with weak fixation. Management of such cases with primary cemented hemiarthroplasty allows patient to ambulate early, thus avoiding most of the complications related to immobilization [7-9].

Many series are published on results obtained with fixation or with hemiarthroplasty in unstable intertrochanteric fracture. But none of the studies compared the outcome of two modalities of treatment i.e. fixation and hemiarthroplasty. Hence we conducted this prospective study to compare the functional results of internal fixation and hemiarthroplasty in unstable intertrochanteric fractures.

Material and Methods

This prospective study is done in 51 patients of intertrochanteric fracture (unstable, comminuted, osteoporotic, trochanteric nonunion and failure of fixation) which were treated at our center by internal fixation (26 patients) or with hemiarthroplasty (25 patients) from 2012 to 2016. Institutional ethical clearance and written informed consent was obtained.

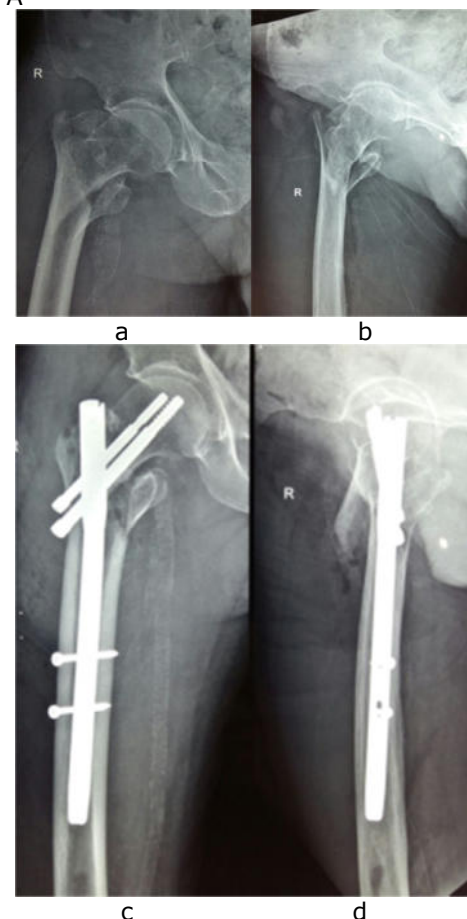
All patients with age more than 65 years with unstable, comminuted, osteoporotic, nonunion or fixation failure of intertrochanteric fracture, who were able to walk unassisted before fracture were included in the study. Open fracture, history of hip arthritis, pathologic fractures and bilateral fractures were excluded from study.

All patients were admitted and after a preoperative workup and anesthetic fitness were planned for surgery. Comorbidities were noted and DEXA scan was done in all patients

to see the level of osteoporosis. The patients were randomized into two groups as per odd or even. Intramedullary fixation with PFN was done in group A (odd) and hemiarthroplasty with cemented bipolar prosthesis in group B (even).

In group A (PFN), cephalomedullary (Proximal femoral nail) nailing was done by standard method. After achieving closed reduction on fracture table, a trochanteric entry was made and guide wire introduced. This was followed by sequential reaming and passage of proper size nail and then finally both proximal and distal locking done (fig 1).

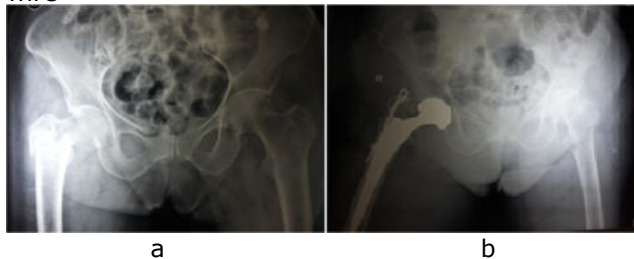
Fig 1. Pre-operative AP (a) and lateral (c) x rays and post-operative AP (c) and lateral (d) x rays of IT fracture treated by intramedullary nailing in group A



In group B (hemiarthroplasty), all patients were operated in lateral decubitus position via posterior approach. After posterolateral incision and incising tensor fascia lata, the fractured head was dislocated by lifting the trochanteric fragment attached with short external rotators (without cutting the rotators). This was followed by femoral canal

preparation, rasping and insertion of proper size cemented bipolar prosthesis with adequate anteversion. Calcar was reconstructed with cement where it was deficient. Greater trochanter was repaired with stainless steel wire or ethibond suture depending on comminution (fig 2).

Fig 2. X ray pelvis AP view pre-operative (a) & post-operative (b) of comminuted IT fracture showing hemiarthroplasty with cemented bipolar and trochantric reconstruction with tension band wire



Postoperatively, range of motion exercises were started from second post-operative day. Toe touch and partial weight bearing was allowed from the third and seventh post-operative day respectively. Full weight bearing was started as per patient pain tolerance. Patients were followed by regularly at regular intervals and outcome assessment was done at final follow up of 12 month using Harris hip scoring system and radiologically by plain radiographs.

Results

A total of 51 patients with 26 in group A (PFN) and 25 in group B (hemiarthroplasty) with mean age 78 years (range 65 to 83) were included in study. Mean follow-up was 3.5 years (range 1.5 to 4). Left side (87.5%) involvement is more than right side (12.5%). Out of 26 patients in group A, 18 were females (69.23%) and 8 were males (30.67%) and in group B 18 were females (72%) and 7 were males (28%). All the fractures belonged to unstable type of fractures. 43% patients were hypertensive, 17.5% were diabetic, 14.5% had cardiac problems and only 25% cases were without any medical comorbidity. DEXA scan showed osteoporosis in 75% and osteopenia in 25% cases.

Average delay in surgery for group A (PFN) and group B (hemiarthroplasty) was 5.7 days and 6.56 days, mean duration of surgery was

75 min (range 45 to 125) and 95 min (range 70 to 132), mean blood loss was 180 ml (range 150 to 280) and 270 ml (range 250 to 420) respectively, with p value <0.05 indicating that blood loss for hemiarthroplasty was significantly more (table 1).

The mean hospital stay was 10 days (range 7 to 21) in group A and 22 days (range 14 to 30 days) in group B. In group A, 16 patients (61.5%) were discharged within a week after first wound inspection, 6 patients (23.07%) after stitch removal after 2 weeks and 4 patients discharged after 3 weeks due to superficial wound inspection. In group B, 12 patients (48%) discharged from hospital within a week of operation and 10 patients (40%) after stitch removal on 2 weeks, 3 patients (12%) discharged after 30 days because of superficial wound infection. In group A, weight bearing was started at mean 48 days (range 42 to 56), whereas in group B mean 8 days (range 5 to 14), hence there was significant statistical difference between time to achieve full weight bearing.

The mean Harris Hip score at 6 weeks were 56.2 and 78.1, at 3 month was 74.53 and 85.87 and at last follow up at 2 years was 87.5 and 88.90 in group A and group B respectively (table 2). Regarding complication, 1 patient in group A had Z-effect; dislocation was seen in 1 patient in group B, whereas superficial infection was seen in two cases, one from each group.

Table 1 - Outcome difference in group A and B.

Parameters	Group A (PFN)	Group B (Hemiarthroplasty)
Mean delay in surgery (days)	5.7	6.56
Duration of surgery (Min.)	75	95
Blood loss (ml)	180	270
Full weight bearing (days)	48	4
Hospital stay (days)	9	15

Table 2 - Mean Harris Hip Score in both groups

Duration	Group A	Group B
3rd day	45.30	47.00
2 weeks	48.20	58.61
6 weeks	56.20	78.10
3 months	74.53	85.87
2 years	87.50	88.90

Discussion

Outcome of osteoporotic, comminuted, unstable intertrochanteric fracture depends on bone stock, patient age, general health profile, co-morbidities, interval between injury and type of surgery and fixation [4-7].

Treatment of intertrochanteric fractures can be by osteosynthesis or hemiarthroplasty [4-10]. In elderly osteoporotic fractures, osteosynthesis can be difficult without immobilization because of poor fixation, as cut out of hardware can be a complication with early mobilization [4-7,11]. Hemiarthroplasty, allows early mobilization but is technically demanding in intertrochanteric fractures [7-9]. We compared the outcome of osteosynthesis by PFN and hemiarthroplasty by cemented bipolar in unstable intertrochanteric fractures in 51 patients, We found that, although the blood loss was significantly higher in hemiarthroplasty group, but the hospital stay, time to full weight bearing mobilization and early Harris hip score was better in hemiarthroplasty group as compared to PFN group. The functional outcome at final follow-up of 2 years was comparable in our study in both the groups.

Peifu tang et al compared both methods hemiarthroplasty and PFNA in IT fracture and found higher complication in hemiarthroplasty group and in elderly patients PFNA was superior to hemiarthroplasty [12]. Our results of current study are contrary to their study but are in accordance with study by Haentjens et al who compared results of internal fixation and bipolar arthroplasty for comminuted and unstable trochanteric fractures [13]. They

showed 75% satisfactory results and less postoperative complications in hemiarthroplasty group due to early weight bearing in this group. Others also emphasized the ability of early mobilization by hemiarthroplasty done for osteoporotic unstable intertrochanteric fracture, as seen in our study, where hemiarthroplasty patients were full weight bearing mobilized in mean 8 days compared to 48 days in PFN group [7-9,14-19].

Overall failure rates in internal fixation of IT fracture ranges from 18%-40%, which is further higher in elderly with unstable fractures [20]. The incidence of screw cutout is about 14%. The low rate of cutout in our study is due to fact that we placed the neck screw in central position in both the views as recommended [20,21]. Further these patients in PFN, had late full weight bearing mobilization, which prevented cutout. Our study, also had low dislocation rate as compared to Woo and Morrey and Vahl AC et al because we did not cut the rotators and proper tense closure was achieved and augmented when needed [18,22].

Conclusion

Hemiarthroplasty for unstable osteoporotic, unstable, comminuted intertrochanteric fractures allows early rehabilitation and full weight bearing walk, which prevents the complication of non-ambulation and makes the post-operative period comfortable and easy for the patient and attendants. But the procedure is limited by higher implant cost, greater blood loss, dislocation, restriction regarding squatting and cross-legged position.

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