Int J Burn Trauma 2022;12(1):13-22
www.IJBT.org /ISSN:2160-2026/IJBT0136451

Original Article

Evaluation of functional outcome and comparison of three different surgical modalities for management of intertrochanteric fractures in elderly population

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Received June 17, 2021; Accepted January 13, 2022; Epub February 15, 2022; Published February 28, 2022

Abstract: Introduction: The purpose of this study was to compare the role of the various surgical modalities ie, Hemiarthroplasty (HA), Dynamic Hip Screw (DHS), Cephalo-medullary nail (CMN) in the management of intertrochanteric fractures in elder patients with comparison of the results and assessment of the complications encountered with each method. Methods: Total 105 adult patients having intertrochanteric fractures managed during July 2013 to December 2018 at tertiary trauma care centre and followed for minimum 12 months were included in the study. Patients were divided into three groups. Primary hemiarthroplasty was done in 35 patients (group A) while DHS and PFN was done in 35 patients each in group B and group C respectively. Functional evaluation was done using Modified Harris Hip score (HHS) at different intervals while ambulatory function was measured using the Parker Mobility Score. Results: The mean age of patients was 72.14±2.9 years. Mean operative time and blood loss in group A was significantly higher than the other two groups. Hemiarthroplasty group could ambulate earlier than DHS/PFN group. Mean HHS at final follow up was 85.40±7 in group A while in group B and group C these values were 76.36±16.45 and 86.85±10.52 respectively. HHS was significantly higher (P, 0.01) in hemiarthroplasty group in comparison to DHS group. Post-operative complications were comparable in all the groups. Conclusion: We support the use of hemiarthroplasty for unstable intertrochanteric fracture in elderly patients with lesser failure rates, early mobilization and better functional outcomes. Early mobilization and less hospital stay should be the goal of every surgical procedure in the elder population.

Keywords: Hemiarthroplasty, DHS, PFN, comminuted intertrochanteric fractures, Harris hip score

Introduction

Intertrochanteric fractures are fragility fractures that usually occur after trivial trauma like fall, especially in elderly patients having osteoporotic bones [1]. Various treatment options have been used for these fractures, ranging from conventional conservative methods of applying tractions to newer surgical modalities using extramedullary osteosynthesis (dynamic hip screw; DHS), intramedullary (cephalomedullary nails; CMN) osteosynthesis and arthroplasty (hemiarthroplasty and total arthroplasty) devices [2]. However, the treatment of unstable intertrochanteric fractures in the elderly has been challenging due to difficulty in achieving anatomical reduction, poor bone quality which can lead to subsequent implant failure and high rates of morbidity and mortality associated with this age group [3]. Early weight bearing is often restricted after internal fixation in these fractures, thus increasing the chances of complications like pulmonary embolism, venous thrombosis and pressure sores [4]. To minimize postoperative complications due to limited ambulation, prosthetic replacements for unstable intertrochanteric fractures were recommended by various surgeons, showing good functional outcomes [5]. There are very few studies in the literature comparing the results of CMN, DHS and hemiarthroplasty in management of intertrochanteric fractures. We prospectively com-

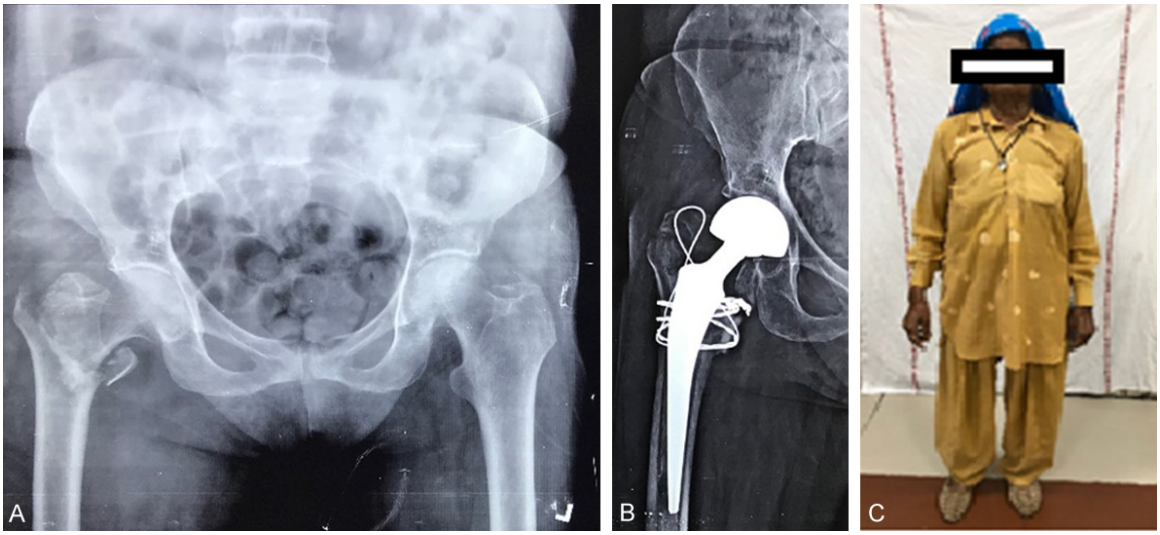

Figure 1. A: Preoperative Anteroposterior view radiograph of 78 yrs old patient with intertrochanteric fracture of Rt hip. B: Radiograph showing well aligned Hemiarthroplasty implant in situ at final follow up. C: Clinical picture showing patient standing without support and excellent functional outcomes at final follow up.

pared and discussed clinical and radiological outcomes in unstable intertrochanteric fractures managed with these three surgical modalities.

Materials and methods

The present study included 105 elderly patients having unstable intertrochanteric fractures according to AO-OTA classification (AO type 31-A2.2 and 31-A2.3), aged 60 years or above and were managed in orthopaedics department at tertiary care institute from July 2013 to Dec 2018 with one of the mentioned surgical modalities: DHS, PFN and hemiarthroplasty and followed up for minimum 12 months after operative intervention. Unstable intertrochanteric fractures included those with a lesser trochanter fracture, reverse oblique fracture and intertrochanteric fractures with posteromedial comminution and lateral cortex breach. Total 150 patients were enrolled while 105 patients (35 in each group), who were found comparable in demographic profiles evaluated further with different parameters. All the patients underwent a process of randomization by chit method in sealed envelopes preoperatively and were divided into 3 groups having 35 patients in each group (group A, primary hemiarthroplasty; group B, DHS; group C, PFN). Informed and written consent was taken from all the patients before enrolling to study and ethical clearance for the study was approved by institutional review board with reference number (No IEC/Th/17/Ortho3).

Patients with associated major injuries of lower extremity; polytrauma patients; patients with infection around the affected hip; pre injury non ambulatory patients; pathological fractures, patients with metabolic bone disorders and underlying neurological disorders were excluded from the study. On presentation full demographic profile of the patient, necessary investigations and adequate radiographs of the hip and pelvis were documented.

Surgical techniques and post-operative evaluation

Hemiarthroplasty: All the patients were operated under spinal anaesthesia. Posterior Moore's approach was used for exposure of proximal femur and acetabulum. If the calcar was found to be deficient, it was reconstructed with an autograft cut from the femoral neck. Cases where greater trochanter or lesser trochanter were fractured, definitive fixation was done using tension band wiring after their reduction as shown in **Figure 1**. Anteversion and retroversion of the prosthesis was assessed intraoperatively in reference to lateral condyle of femur.

Internal fixation: In group B and C, all the patients were operated in supine position using lateral approach under image intensifier guid-

ance. The fractures which were not reduced by closed manoeuvres, were managed by open reduction and fixation. We aimed to obtain the correct femoral neck shaft angle or a slight valgus position with optimum position of the implant. Varus malposition and fracture fragments distraction has to be avoided during the surgery.

Postoperative radiographs were taken on first postoperative day to assess the position of prosthesis/implant. Intravenous antibiotics were continued for 4 days postoperatively and sutures were removed on 12th-14th postoperative day. In Hemiarthroplasty group partial weight bearing with the frame was started on 3rd day while full weight bearing was allowed as per patient's compliance and confidence level. In DHS and PFN groups, partial weight bearing was started with the help of a walker as soon as possible while full weight bearing was allowed after bony union was achieved.

Evaluation and follow-up: Patients were evaluated clinically and radiologically at 1 month, 3 months, 6 months and 12 months follow up with varying parameters including range of motion, limb length discrepancy, mobility status of the patient and complications. Radiological evaluation was done at each follow up to ascertain implant position and to see bone implant assembly. At each follow up, functional assessment was done using Modified Harris Hip Score (HHS) while ambulatory function was measured using the Parker Mobility Score. Environmental mobility was also noted in the ambulatory function assessment. The Harris hip score is a joint specific score that consists of four subscales. The first is pain, which measures pain severity (44 points); function, which is made up of daily activities and gait (47 points); the absence of deformity, which is a subscale that measures hip flexion, adduction, internal rotation, leg length discrepancy and range of motion measures (4 points). The HHS survey has 10 question items and scores range from 0-100 with higher scores representing less dysfunction and better outcomes.

The Parker Mobility Score (PMS) is a composite measurement of the patient's mobility indoors, outdoors and during shopping and is used to measure the mobility as an outcome measure. The Parker Mobility Score answers three questions, each valued 0-3 points. Based on the sum of the mobility assessment in three different situations (able to get about the house, able to get out of the house and able to go shopping), the total score ranges from 0-9. For each of the three situations the mobility has to be scored on: no difficulty (3 points), with an aid (2 points), with help from another person (1 point) or not at all (0 points). The highest overall score of 9 indicates the best possible mobility. Environmental Mobility Score consists of 3 parameters of mobility-indoor (score 1), outdoor (score 2) and community (score 3). Higher the score, better is the outcome.

Statistical analysis

All the relevant data of three groups were documented, compared and analysed by software SPSS version 20.0. Quantitative data were expressed as mean and standard deviation while analysed by descriptive statistical methods including the Pearson Chi square test and One-way Analysis of Variance (ANOVA). Post-hoc test was applied to compare multiple variables. A P value of <0.05 was considered as statistically significant.

Results

Demographic profile

Demographic profile and pre-injury parameters of all three groups (35 patients in each) managed by different modalities are described in **Table 1**. There was more female affected in all the three groups (22; 24; 25) and mean age of presentation in Gp A, Gp B and Gp C were 76.24 years, 69.80 years and 70.38 years respectively. According to AO classification, total 87 patients were presented as 31A2.2 type, while 18 patients were classified in type 31A2.3 and left side affected more than right. Comparable intraoperative and postoperative parameters of all the three groups are elaborated in **Table 2**. Most common documented chronic comorbidities were hypertension (HTN) (n, 25) followed by diabetes mellitus (DM) (n, 17) and chronic obstructive pulmonary disease (COPD) (n, 7) in all cohorts.

Operative parameters

In Gp A, the average operative time was 115.6±10.92 minutes, while it was 101.45 and 112.80 minutes in Gp B and Gp C respectively,

Table 1. Comparison of pre injury parameters and demographic profile among 3 groups of intertrochanteric fractures managed with different modalities

Parameters	Group A (n, 35) Hemiarthroplasty	Group B (n, 35) DHS (extramedullary)	Group C (n, 35) PFN (intramedullary)
Age (Years ± sd) (Range in years)	76.24±10.94 (60-94)	69.80±8.07 (60-85)	70.38±7.79 (60-82)
Sex (Male; Female)	13; 22	11; 24	10; 25
Side (Left; right)	27; 8	21; 14	18; 17
Mode of trauma	Fall-35	Fall (34), RTA (1)	Fall (33), RTA (2)
Fracture type (AO/OTA class.)	31-A2 (28)	31-A2 (30)	31-A2 (29)
	31-A3 (7)	31-A3 (5)	31-A3 (6)
Comorbidities (n)			
HTN; DM; COPD	11; 7; 2	7; 4; 2	7; 6; 3

Sd: standard deviation; HTN: hypertension; DM: diabetes mellitus; COPD: chronic obstructive pulmonary disease; DHS: dynamic hip screw; PFN: proximal femoral nail.

Table 2. Comparison of intraoperative and postoperative parameters among 3 groups of intertrochanteric fractures managed with different modalities

Parameters	Intertrochanteric Fractures			*P* value			
	Gp A (HA)	Gp B (DHS)	Gp C (PFN)	Gp. A vs. B*	Gp. A vs. C*	Gp. B vs. C*	Multi Gp**
Duration of surgery (Minutes ± sd)	115.6±10.92	101.45±14.96	112.80±17.564	0.001	0.512	0.02	0.005
Intraoperative blood loss (ml ± sd)	200±34.15	156.8±37.626	130.3±48.639	0.001	0.001	0.001	0.001
Hospital stays (days ± sd) (Range)	6.52±1.19 (3-10)	8.56±2.053 (7-15)	8.42±2.542 (5-15)	0.001	0.001	0.845	0.001
Partial weight bearing (days ± sd) (Range)	3	45.31±14.66 (35-90)	14.25±8.34 (5-80)	-	-	0.001	-
Full (days ± sd) (Range)	5.91±1.76 (5-12)	85.89±15.45 (60-120)	48.20±10.25 (45-100)	0.001	0.001	0.001	0.001
Radiological union (weeks ± sd)	-	15.74±1.36	14.20±1.360	-	-	0.001	-
Limb discrepancy (cm ± sd)	0.4±0.64	1.05±0.189	0.50±0.02	0.001	0.478	0.001	0.001
Implant sliding (cm ± sd)	-	0.65±0.263	0.74±0.403	-	-	0.392	-
Neck shaft angle (degrees)	-	Immediate post-op (130.95)	Immediate post-op (130.16)				
		Final follow-up (125.37)	Final follow up (128.45)				

*Independent t-test/Chi-square test, **One-way Analysis of Variance (ANOVA).

(P, 0.005). Fixed and modular bipolar prosthesis was implanted in 26 and 9 patients respectively, while cemented femoral stems were used in total 31 patients. Mean blood loss in Gp A (200±34.15 ml) was significantly higher (P, 0.001) than in Gp B (156.8±37.63 ml) and Gp C (130.3 ml±48.64).

Post-operative parameters and rehabilitation

In Gp A, all the patients were allowed partial weight bearing (PWB) on day 3 with the help of a frame walker while it was 45.31±14.66 days and 14.25±8.34 days in group B and C respectively. Mean time of full weight bearing (FWB) with walking aid was 5.91±1.76 days in Gp A, while for Gp B and C these were 85.89±15.45 and 48.20±10.25 days, respectively and significantly better in Gp A. The average hospital stay was 6.52 days in Gp A which was significantly lower (P, 0.001) than in group B (8.56 days) and C (8.42 days). 40% (14) patients in Gp A walked with support pre-injury while in Gp B, 42.8% (15) and in group C, 37% (13) patients walked with support previous to fracture. At final follow up patients were independently mobile (Gp A; B; C: 17; 12; 12), needed support (Gp A; B; C: 13; 19; 21) and wheelchair bound (Gp A; B; C: 1; 1; 0) in three mentioned groups.

Complications

Limb length discrepancy (LLD) was seen in 12 patients in Gp A with mean shortening of 0.4±0.64 cm and probably due to deep seating of the prosthesis. It was observed in 10 patients (1.05±0.189) and 8 patients (0.50±0.02) in Gp

Table 3. Comparison of functional outcomes with Harris Hip Scores at final follow-up

	Intertrochanteric Fractures			*P* value			
	Group A (Hemiarthroplasty)	Group B (DHS)	Group C (PFN)	Gr. A vs. B*	Gr. A vs. C*	Gr. B vs. C*	Multi group**
Harris Hip Score	85.40±7.53	76.36±16.45	86.85±10.52	0.01	0.589	0.01	0.01
Excellent	10	8	8	0.584	0.584	1	0.815
Good	19	15	18	0.338	0.810	0.472	0.609
Fair	1	3	4	0.303	0.163	0.690	0.387
Poor	1	6	3	0.04	0.303	0.284	0.122

*Independent t-test/Chi-square test, **One-way Analysis of Variance (ANOVA).

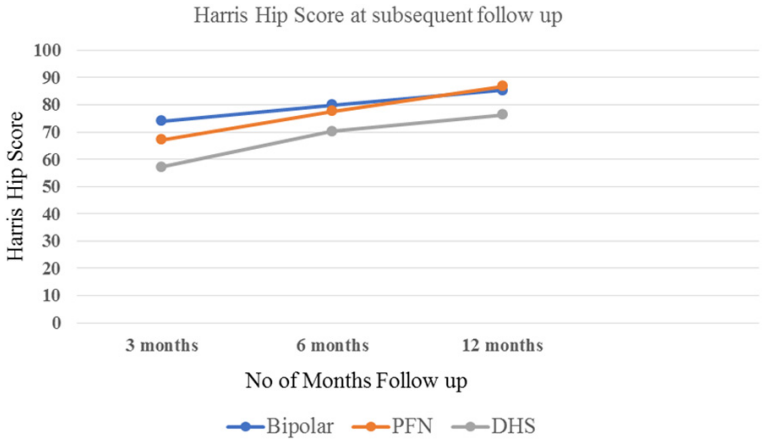

Figure 2. Graph showing Comparative illustration of Harris Hip Scores at subsequent follow up among 3 groups managed with different surgical modalities.

and compared among different groups as described in **Table 3** and illustrated in **Figure 2**. Mean Harris hip score at 3 months was 74±7.77, 57.26±8.53 and 67.15±8.17 in group A, B and C respectively. Mean HHS at 6 months increased to 79.90±7.70, 70.26±13.88 and 77.7±9.40 in group A, B and C respectively. Mean HHS at final follow up was 85.40±7 (range 62-95) in group A while in group B and C these values were 76.36±16.45 (range 59-95) and 86.85±10.52 (range 60-96) respectively. It was significantly higher (*P* value =0.01) in hemiarthroplasty group than DHS group.

B and Gp C respectively, which was due to comminution and collapse at the fracture site.

Pressure sore was developed in two patients in Gp A, which was managed conservatively with disciplinary nursing care. Dislocation of the prosthesis was seen in one patient after 2 months due to simple fall in Gp A. Non-union of greater trochanter was noted in one patient with breakage of encirclage wiring at final follow up. There was one case each of superficial surgical site infection in Gp A and Gp B, which was managed with dressing and antibiotic coverage. There was no incidence of iatrogenic fracture, deep infection, deep venous thrombosis (DVT), urinary tract infection, heterotrophic calcification and non-union in any group of the present study.

Functional evaluation

Functional outcomes were assessed using Mean Harris hip scores at different intervals

Mean Parker Mobility Score at final follow-up in Gp A, Gp B and Gp C was 6.90, 5.40 and 6.20, respectively. Environmental Mobility Score at final follow up was 2.8, 2.0 and 2.2 in Gp A, Gp B and Gp C, respectively.

Discussion

Extramedullary plates (DHS) surpassed earlier implants described in previous studies in the literature, however in unstable fractures fixation failure was seen in up to 20% cases [6]. Extramedullary implants have a biomechanical disadvantage over intramedullary implants in having a longer lever arm between the weight bearing axis and the implant, thus increasing the bending moment of the implant, thereby causing fatigue failure of the implant [7, 8]. Intramedullary fixation has been a preferred treatment for unstable intertrochanteric fractures [9]. However, these devices are prone to

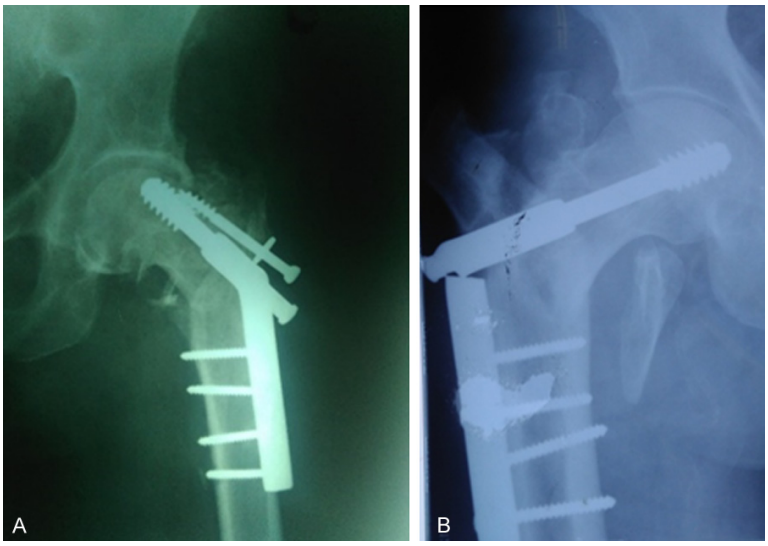

Figure 3. A: Radiograph showing screw cutout led to implant failure at 1 month follow up in 70 yrs old patient managed previously with DHS. B: Radiograph showing breakage of plate led to implant failure at 2 months follow up in 74 years old patient managed previously with DHS.

various complications including screw cutout, Z effect and fracture near the distal aspect of the nail, particularly with the short nails [10]. Internal fixation achieved favourable results in stable fracture patterns. However, despite advancements in surgical techniques and implant design, encouraging results have not been achieved in unstable fractures due to problems of poor fracture reduction and varus collapse of the fracture [2].

To overcome these challenges and to improve surgical outcomes, many authors advocated prosthetic replacement for unstable comminuted intertrochanteric fractures in elderly patients, showing the ability of early ambulation of the patients with good long-term results [1, 4]. Moreover, the problems of malunion and non-union are not seen with hemiarthroplasty [11, 12].

The mean operative time in group A (115.6± 10.92 min) was comparable to studies conducted by Shen et al. (121±62 min) and Mansukhani et al. (106.2±26.31 min) [13, 14]. PFN needed more time for proper placement of hip screws and distal locking, so the operative time is more in PFN group than DHS group in our study. We observed higher surgical time in group A than other groups as trochanteric repair with encirclage wiring and calcar reconstruction consumed additional time during surgery.

Mean blood loss was significantly higher in hemiarthroplasty group (200±34.15 ml). Due to minimum invasiveness and less soft tissue handling in CMN implants, mean blood loss was less than extramedullary implants (DHS; PFN: 156.8 ml; 130.3 ml). Various other authors in the literature have also documented lower blood loss in the internal fixation group (DHS/PFN) than hemiarthroplasty group [13, 15].

Mean Sliding of implant in DHS and PFN groups were 0.65 cm and 0.74 cm respectively, contrary to Hardy et al. who found less sliding in CMN implants [16]. Mean difference in immediate postoperative to final follow-up neck shaft angle was 5.58 degree and 1.71 degree in DHS group and PFN group respectively. Domingo et al. had recorded >5 degree of change in neck shaft angle in patients treated with DHS [17]. Differences were more in DHS group due to more fracture collapse and varus angulations.

Time to full weight bearing was significantly lower (P, 0.001) in hemiarthroplasty group than the other two groups in present study. Various other authors also observed faster rehabilitation and significantly lower incidence of pressure sores and pulmonary infection in hemiarthroplasty group [18, 19]. Emami et al. observed faster restoration of post op walking ability in the bipolar group than DHS group, thereby corroborating with our results [20].

In our study we obtained higher mean Parker Mobility Score at final follow-up in hemiarthroplasty group (6.9) than the other two groups (5.40 in group B and 6.20 in group C respectively). Also, highest Environmental Mobility Score at final follow up was reported in group A (2.8) showing that better ambulation and rehabilitation of the patients is possible with the hemiarthroplasty.

One patient had screw cut out as shown in **Figure 3**, which was lost to follow up while

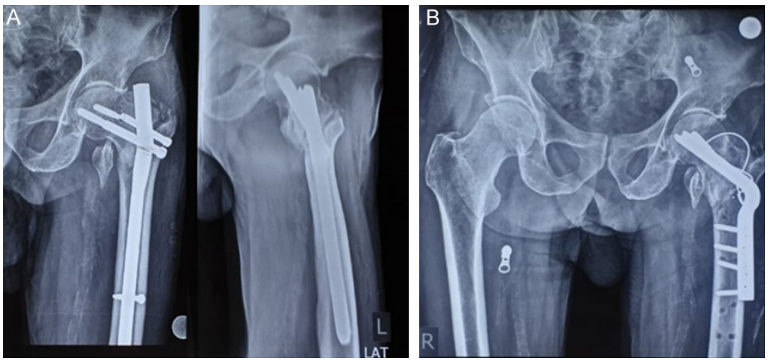

Figure 4. A: Radiographs showing failed implant in 72 yrs old patient at 3 months follow-up, who was managed by PFN previously. B: Radiograph showing adequate fixation in revision surgery using double angle blade plate.

another had broken implant barrel as shown in **Figure 3**, managed by revision surgery in DHS group. One case of implant failure in PFN group was reoperated with angle blade plate as shown in **Figure 4**. We obtained a failure rate of 5.7% with DHS which was lower than study by Nordin et al. (16.7%) [21]. Implant cut out from the femoral head continues to be an important cause of mechanical failure of these implants, though the implant failure depends on various factors like fracture pattern, fracture fragments reduction, screw positioning in the femoral head, tip apex distance of screw and bone density. Various other authors have also reported screw cut out in the DHS group in their respective studies [6, 19]. Domingo et al. had observed fracture of greater trochanter during nail insertion in 9 cases [22]. We had not found such complications and morbidity in our cohorts.

One patient of group A, dislocated hip in early follow up and managed by closed manoeuvres using general anaesthesia under image intensifier guidance. Hip dislocations have been reported in the past studies conducted by various authors which were managed by closed reduction [19, 23]. Hemiarthroplasty has some described disadvantages, as it is more prone to complications including dislocation, stem loosening, acetabular protrusion and erosion [24].

4 patients died in hemiarthroplasty group due to idiopathic reasons. Geriatric patients with cardiac/pulmonary comorbidities are more prone to suffer from cement induced cardiovascular problems. A 94-year aged male with poor chest condition, developed arrythmia during cementing intra-operatively and died 3 days after the surgery due to cardiac arrest. To avoid cardiopulmonary complications cementing should be done cautiously in elderly patients having low cardiopulmonary reserve. 3 patients in DHS group and 2 patients in PFN group were died at subsequent follow up due to their systemic illness. The overall mortality rate in our study was 8.5%. Various other authors have also reported increased mortality in hemiarthroplasty group in their respective studies [6, 23].

The patients managed with hemiarthroplasty reported higher quality of life and lower average pain at all follow-ups compared to those operated with DHS/PFN according to EQ 5D (**Table 4**). Due to early ambulation after hemiarthroplasty, these patients could return to their pre injury level of activity more quickly, so higher quality of life was achieved in these patients when compared to the other two groups. Also, fracture union is not needed after hemiarthroplasty, so the pain was lower in hemiarthroplasty group.

Mean Harris hip scores at 3 and 6 months were (74±7.77) and (79.90±7.70) in group A respectively while these were lowest in group B at the same follow-up (57.26±8.53) and (70.26±13.88). At 12 months final follow up, highest HHS was achieved in PFN Group (86.85±10.52) and least in DHS group (76.36±16.45), which is illustrated in **Figure 2**. However, there was no significant difference (*P* value >0.05) in the HHS in hemiarthroplasty and CMN group at the final follow up. Since the hemiarthroplasty group was allowed full weight bearing earlier than other two groups, higher HHS were achieved in hemiarthroplasty group till 6 months. The results were comparable to Özkayın et al. who reported higher HHSs in hemiarthroplasty group for up to six months and higher values in PFN group at 12 months [25].

Table 4. Comparative evaluation of quality of life parameters according to EQ 5D 3L at 6 and 12 months in different groups

Parameters	Group A (Hemiarthroplasty)		Group B (DHS)		Group C (PFN)	
	At 6 m Follow up	At 12 m follow up	At 6 m Follow up	At 12 m follow up	At 6 m Follow up	At 12 m follow up
Mobility						
No problems in walking about	24 (77%)	26 (84%)	18 (56%)	19 (59%)	19 (58%)	20 (61%)
Some problems in walking about	6 (19%)	4 (13%)	8 (25%)	11 (35%)	11 (33%)	10 (30%)
Confined to bed	1 (3%)	1 (3%)	6 (19%)	2 (6%)	3 (9%)	3 (9%)
Self-care						
No problems with self-care	25 (81%)	27 (87%)	17 (53%)	18 (56%)	18 (55%)	20 (61%)
Some problems with self-care	5 (16%)	3 (10%)	9 (28%)	12 (38%)	12 (36%)	11 (33%)
Unable to wash or dress	1 (3%)	1 (3%)	6 (19%)	2 (6%)	3 (9%)	2 (6%)
Usual activities						
No problems in performing usual activities	24 (78%)	25 (81%)	16 (50%)	16 (50%)	18 (55%)	20 (61%)
Some problems in performing usual activities	6 (19%)	5 (16%)	10 (31%)	12 (38%)	12 (36%)	11 (33%)
Unable to perform usual activities	1 (3%)	1 (3%)	6 (19%)	4 (12%)	3 (9%)	2 (6%)
Pain/discomfort						
No pain or discomfort	24 (77%)	26 (84%)	12 (38%)	14 (44%)	15 (45%)	18 (55%)
Some pain or discomfort	7 (23%)	5 (16%)	19 (59%)	17 (53%)	17 (52%)	14 (42%)
Extreme pain or discomfort	-	-	1 (3%)	1 (3%)	1 (3%)	1 (3%)
Anxiety/depression						
Not anxious or depressed	28 (90%)	29 (94%)	20 (63%)	21 (66%)	25 (76%)	27 (82%)
Moderately anxious or depressed	3 (10%)	2 (6%)	12 (37%)	11 (34%)	8 (24%)	6 (18%)
Extremely anxious or depressed	-	-	-	-	-	-

Intertrochanteric fractures must be treated considering the age of the patient, bone quality, fracture pattern and surgeon's expertise. Various factors like bone collapse, fixation failure, and lag screw cut-out are high when fixing unstable fractures with implants like dynamic hip screws or cephalomedullary nails resulting in poor functional outcome. Sancheti et al. concluded that hemiarthroplasty for unstable intertrochanteric fractures in elderly patients resulted in early ambulation with good functional results [3]. This corroborates with findings of our study as bipolar hemiarthroplasty proved a better treatment modality in elderly patients. The limitations of our study are small sample size and short term follow-up of 12 months.

Conclusion

Primary hemiarthroplasty for the treatment of unstable intertrochanteric fractures in elderly patients seems to be a secure and effective procedure, showing an earlier ability to bear full body weight with lesser failure rates and better functional outcome. Early mobilization is advantageous in preventing complications like pulmonary complications, pressure sores and generalized deconditioning of the patient associated with prolonged immobilisation. Early weight bearing in improperly positioned osteosynthesis implants increases the risk of cut out and subsequent implant failure. Extramedullary implants should be avoided in unstable fracture patterns. The results of bipolar hemiarthroplasty are promising as compared to internal fixation in elderly patients.

Disclosure of conflict of interest

None.

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