"STUDY OF PRIMARY CEMENTED TOTAL HIP ARTHROPLASTY IN FRACTURE NECK FEMUR ABOVE THE AGE OF SIXTY (60) YEAR"

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INTRODUCTION

Fracture neck of femur has always been a great challenge to the orthopaedic surgeon and still remains the unsolved mystery as far as the treatment and its results are concerned.

Non-operative treatment has its own disadvantages in terms of a high mortality rate, problems like thromboembolism, bedsores, atelectasis and an inevitable non-union[1].

The operative treatment of a displaced sub capital fracture in elderly is also controversial. The dilemma is whether to reduce the fracture and use internal fixation or to perform a total or partial hip replacement arthroplasty. Young patients should be treated by internal fixation and very old less healthy patients by hemiarthroplasty, which is agreed upon by most authors, there remains a group in between where both these option have their advocates[2].

Internal fixation is associated with a high incidence of non-union and avascular necrosis as it is influenced by many factors such as age of the patient, degree of osteoporosis, displacement of head, delay in reduction, the type of fixation device and its final position[3].

Hemiarthroplasty avoids these complications, which result from inadequate-blood supply to the femoral head, but is often unsatisfactory in younger patients because of high incidence of acetabular erosion and pain. Infection, loosening and dislocation are other problems, which add to the poor clinical results and a need for second surgery. Repeat surgery has its own share of high incidence of medical complications and mortality[4 - 7].

It has been argued that total hip arthroplasty is a good primary treatment for this group as it is the salvage procedure for failures of both the above mentioned procedures. The aim of surgical intervention in these elderly patients is to restore them to pre-fracture status as rapidly as possible, obviating the complications of failed osteosynthesis, secondary surgery and recumbency[8, 9].

It was decided as a protocol to use primarytotal hip replacement in active elderly patients of age 60 years and above who had a fracture of the femoral neck. The surgery was performed in various hospitals of Delhi. The outcome of primary total hip replacement done in 45such cases has been evaluated and results are presented.

MATERIALS AND METHODS

This study was conducted in various hospitals in New Delhi, between the period of July 2006 to December 2011. 45 hips were included in this study with cemented prosthesis in 45 patients with a fracture of the femoral neck above the age of 60 years who came for regular follow up till 1 year.

Detailed clinical and radiological examination with other relevant investigations was carried out in all patients in orthopaedic emergency/ OPD. The clinical assessment involved a detailed history. The salient questions asked were time of injury, mode of injury, pre-injury activity status, any previous hip pathology/pain.

General physical and systemic examination was carried out in detail about renal system, cardiovascular system, respiratory system and central nervous system for any neurological involvement.

The affected hip was clinically compared with the normal hip and the following observations were noted: attitude, deformity, localtenderness, attempted movements, limb length discrepancy and any neurovascular deficit.

Routine investigation like Complete blood counts, Blood urea, Blood sugar, Electrolytes , Urine, ECG were carried out in all patients.

Special investigations like ESR, thyroid function test (TFT), *Bence Jones* Proteins, electrophoresis, PT, PTTK, Echocardiography and others were carried out whenever indicated.

SUBCAPITAL FRACTURE NECK OF FEMUR IN X-RAY AP AND LATERAL VIEWS

An X-ray of the pelvis with both hip joints AP view and X-ray of the chest PA view were performed as a routine.

The position of the limb during pre-operative X-ray of pelvis with both hips was with both lower limbs in full internal rotation to visualize the fracture of the femoral neck. Total thickness of the cortex and width of the medullary canal of femur, into which the stem was to be inserted, was determined. Radiographs of the pelvis were reviewed to see if there were any signs of osteoarthritis, the medial wall and protrusioacetabuli.

Pre-operative planning as a routine included templating to know the size of the prosthesis, neck length and requirement of additional procedures like the use of bone graft to fill defects in acetabulum or femur. For orientation of the pelvis in the frontal

plane the two tear drops were identified and a line was drawn through their distal end. A second line perpendicular to this was drawn through the mid point of the pubic symphysis. All size of one type of prosthesis is represented on one template (standard magnification 1.15). The size of the femoral component was determined by adjusting its medial side to the medial wall of the medullary canal. T line (trochanteric line) of the template was placed at the apex of the greater trochanter. The size of the prosthesis determines the offset; the larger the prosthesis, larger the offset. Three neck lengths allow for an additional increase in offset, the acetabular component was then chosen by measuring the radiological diameters of the bony acetabulum with the template[37].

The procedure was explained in detail to the patient and relatives including other operative treatment options. The advantages and disadvantages of a total hip arthroplastyvis-a-vishemiarthroplasty were explained. Those who opted for a total hip replacement were taken up for surgery.

EXCLUSION CRITERIA

- Active infection of the hip joint or any where systemically
- Patients with any process that is rapidly destroying bone (generalised progressive osteopenia)
- Bedridden patients
- Any patients with neurological disorder like Parkinsonism hemiplegia etc.

PROPHYLACTIC ANTIBIOTIC

All the surgeries were carried out underan antibiotic cover. A broad spectrum antibiotic was chosen which covered both gram positive and gram negative organism. We used a combination of cefuroxime and amikacin(wherever possible), started on the evening of the pre-operative day and repeated at the time of induction and then continued for 2 days postoperatively. Periodic evaluation of kidney function tests was carried out to detect nephrotoxicity of the antibiotics.

Prophylactic anti coagulant therapy was given in selected high risk patients,for a total of 5 days, who had pre operative co morbid conditions like diabetes, heart disease or morbid obesity.

SURGICAL TECHNIQUE

All operations were done by the same surgeon using the Modified direct lateral Liverpool Harding's approach. It is based on the anatomical observation made by Mcfarland and Osborne that gluteus medius and vastuslateralis are in direct functional continuity.

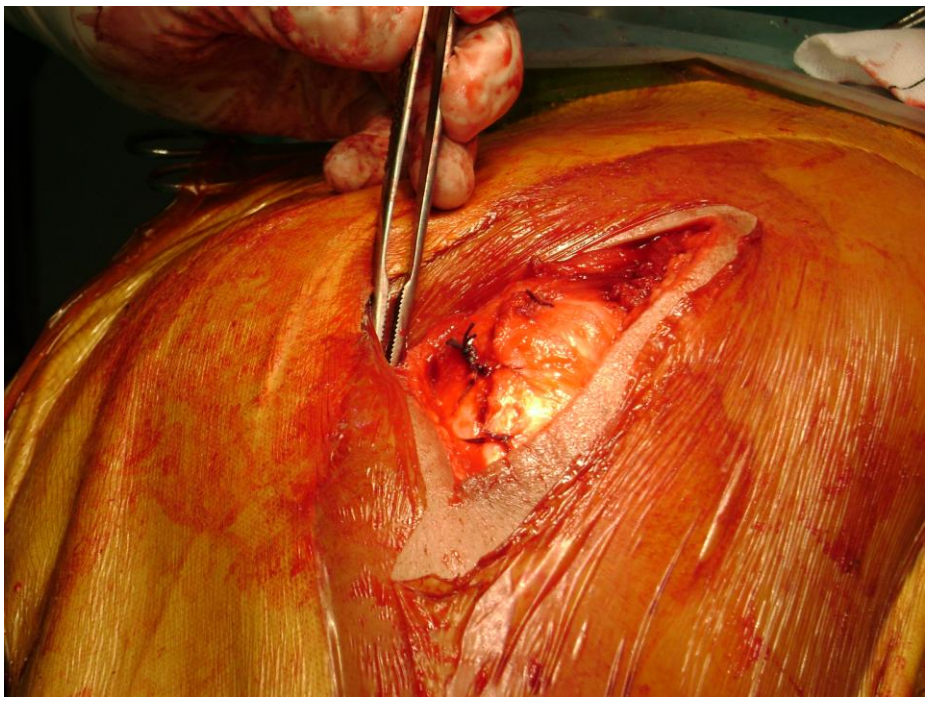
The patient was placed in lateral position with the limb draped free. A mid lateral skin incision was made centered over the greater trochanter extending two inches proximal and four inches distal to it.

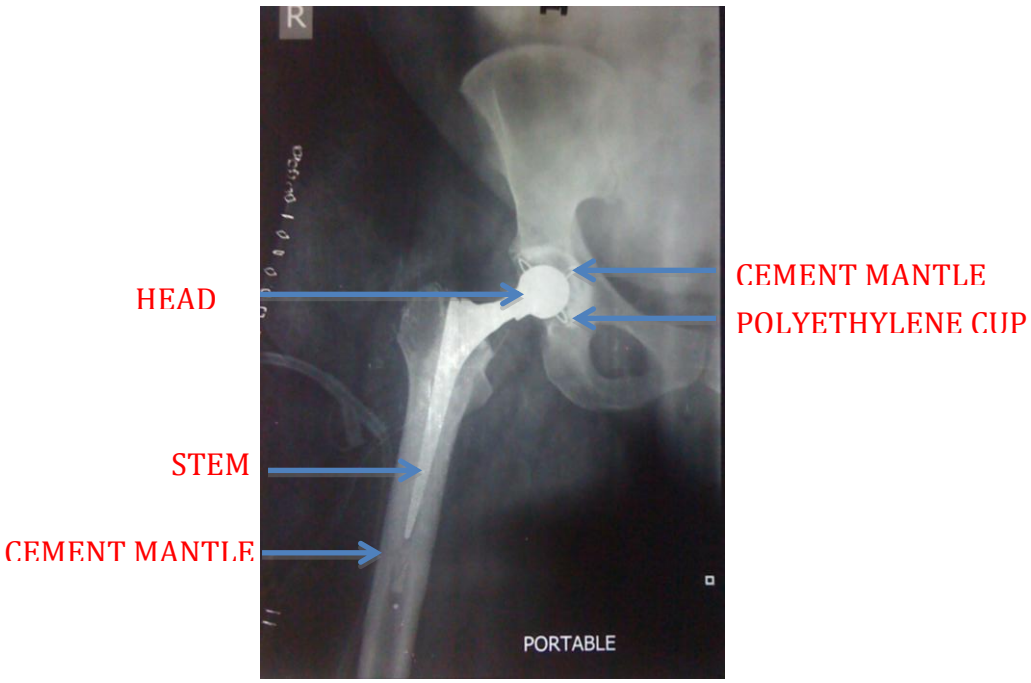
The skin, gluteal fascia and the iliotibial band were incised along the line of incision. Gluteus maximus and tensor fascia lata are retracted proximally and laterally respectively with the help of a self retaining retractor. A mid line incision is given to the vastuslateralis distally and curved along the greater trochanter proximally between gluteus minimus and medius. A thin sliver of the greater trochanter is lifted off with the help of an osteotome from the lateral surface of the trochanter. The mass consisting of part of greater trochanter gluteus medius and medial half of the vastuslateralis is retracted anteriorly and medially. The tendon of gluteus minimus is retracted proximally to expose the capsule of hip joint. The capsule of the hip joint is divided and the fracture site is exposed. The head is delivered with the help of a corkscrew or bone lever.

Osteotomy of the neck is performed with a handsaw. A bone lever is placed underneath the labrum at the anterior margin of the acetabulum and retracted distally and anteriorly to give a good view of the acetabulum. The acetabulum is prepared by reaming till the subchondral bone is exposed. Excessive supero-medial reaming is avoided. The size of the cup is determined by using a number of trial cups. The cup is placed 45° from horizontal and in neutral version with the help of an external angle guide.

Femoral canal is then prepared by reaming using broaches of increasing size till the preoperative measured size is reached. Rotational and bending stability is tested with the last used broach. Hip is reduced after placing trial head on the broach.

Joint stability, soft tissue tension and movements in all direction are checked and adjusted by choosing the appropriate neck length. Top of the greater trochanter was used as a final guide to limb length, the center of the femoral head was kept at the same transverse level as the apex of the greater trochanter. Trial components are then removed and the femoral medullary canal is prepared to receive the femoral component. Bleeding is controlled by washing with hydrogen peroxide. The cavity is packed with dry gauze which is removed just prior to cementing. The medullary canal distal to the part receiving the femoral stem is blocked with a plug (bone or plastic). Cement was introduced using a cement gun maintaining a high pressure inside the medullary cavity (second generation cementing technique). Following this femoral component was introduced in neutral version, with a centraliser attached to its distal tip. The operative field was irrigated with saline. Two transverse holes were made with a 3.2 mm drill bit on the proximal and distal ends of greater trochanter, anchoring the sliver of bone to it with non-absorbable material. Wound was closed in layers and a compression bandage applied.





BASIC PARTS OF CEMENTED TOTAL HIP REPLACEMENT

POST OPERATIVE MANAGEMENT

Average of one unit of blood was transfused in the postoperative period. Hips were immobilized in wide abduction splint/pillow for 48 hours. On the first post operative day, in bed radiograph were taken to check the position of the prosthesis. Isometric quadriceps exercises were initiated as soon as possible. Physiotherapy in the form of deep breathing exercises, coughing and ankle mobilization was also started. Patient was allowed to sit in the bed by same day evening. Active knee ROM exercises were started with the patients sitting on the edge of the bed by second day. Patient was encouraged to stand from day two using a walker and weight bearing as tolerated gradually. Toilet training was started in hospital from 3rd day and discharge was done on an average after 5 days post operative. Patients

were instructed to avoid excessive flexion adduction and internal rotation on the affected side for 6 weeks.

CLINICAL EVALUATION

The hips were evaluated according to the criteria laid down by *Harris*[39].

The Harris Hip score assesses pain, function, deformity and range of motion of the affected hip and this was used to analyze the results of these cases.

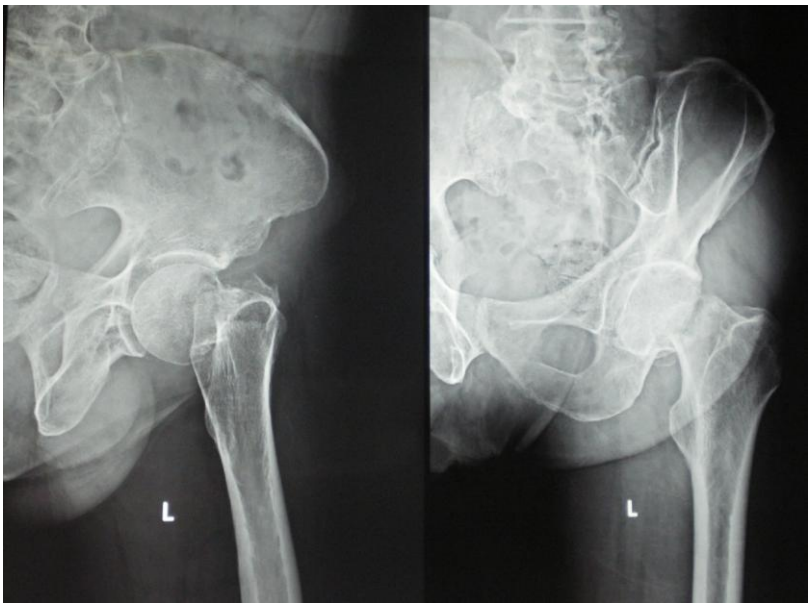
All the patients were assessed clinically at 2 weeks, 4 weeks, 8 weeks, 12 weeks, 6 months and 1 year from the date of surgery. Specific questions were asked regarding use of walking aids, capability of independent ambulation, use of public transport along with limb length measurements at each follow up.

Trendelenberg's test was performed in all patients to assess the abductor mechanism.

RADIOLOGICAL EVALUATION

Radiological review included routine AP view taken prior to the surgery to grade the fracture according to Gardens classification.

Observations and measurements were made on the anteroposterior and lateral radiographs of the hip. Assessments were made for any radiolucency (defect in the cement mantle) around the stem /cup, orientation of stem and cup, union of the trochanteric sliver, change in the position of the stem/cup andheterotropicossification .



SUBCAPITAL FRACTURE OF NECK OF FEMUR - AP AND LATERAL VIEWS

Femoral stem was assessed by using the system of *Gruen et al*which divides the proximal part of the femur into seven zones, three each on the lateral and medial sides and one below the tip of the stem. Only definite evidence of loosening was considered significant. Definite loosening was presumed to have occurred if there was subsidence of more than 5mm. Distance was measured between the center of rotation and most prominent part of lesser trochanter.

CEMENTED TOTAL HIP ARTHROPLASTY

Demarcation of acetabular components was recorded in zones described by De Lee and Charnley who divided it into three zones. Acetabular cup loosening was assessed using the criteria of *Hodgkinson*et al[41]. Any acetabularcomponent, which had a continuous radiolucent line in all three zones, was considered to be loose.

The trochanteric fragment was assessed for displacement, non union and breakage of the wires if used.

Stem orientation was determined from the immediate postoperative radiograph. It was compared with the last follow up radiograph for any change.

The inclination of the cup from the horizontal was measured by drawing of a horizontal line through both tear drops and of another line through the plane of the opening of the cup. Vertical positioning of the acetabular component was measured as the distance between the tear drop line and the centre of rotation. Horizontal positioning was measured as distance between centre of rotation and a line through the centre of the teardrop perpendicular to the tear drop line.

Heterotopic ossification was classified using the system of *Brookeret al*[42].

Grade I	Represents islands of bone with in the soft tissue about the hip
Grade II	Include bone spurs in the pelvis or proximal end of femur leaving at least 1 cm between the opposing surfaces.
Grade III	Represent bone spurs that extend, from the pelvis or the proximal end of femur which reduce the space between the opposing bone surfaces to less than I cm.
Grade IV	Indicates radiographic ankylosis

OUTCOMES

AGE AND SEX DISTRIBUTION

There were 18 males and 27 females ranging from 60 to 75 years of age.

The ratio of male to female 2:3 maximum number-of patients were in 60-65 age groups. Mean age was 64.6 years.

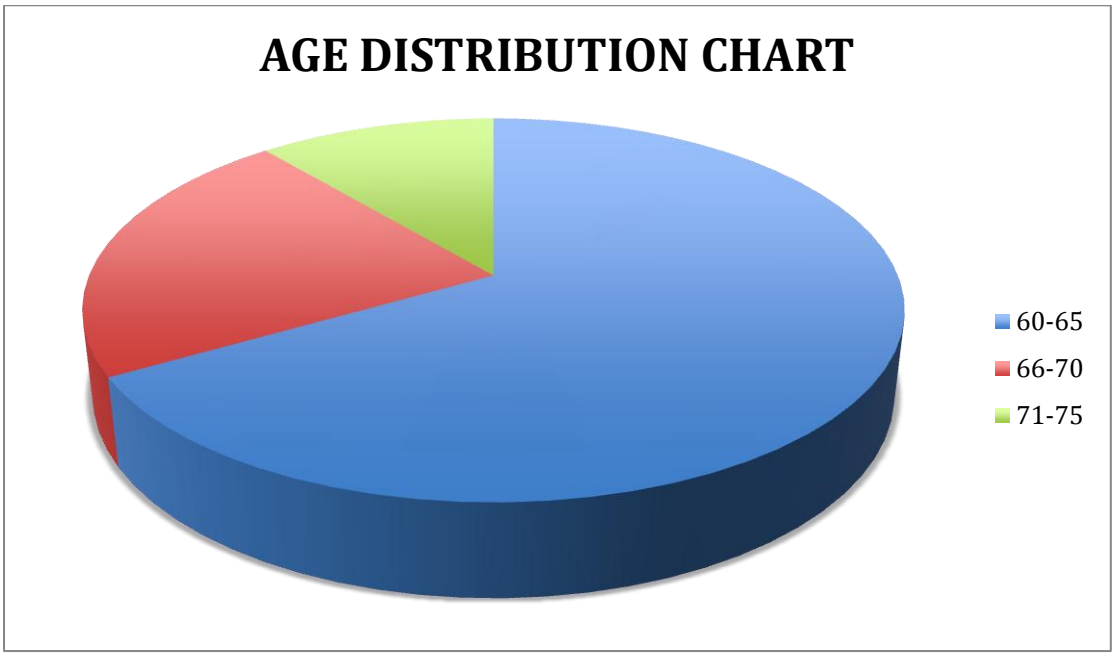


Table 1: Age distribution

Age (years)	No. of patients	Percentage
60-65	30	67
66-70	10	22
71-75	5	11

67% of the patients were in the 60-65 year age group. Mean age at the time of operation being 64.6 years (range 60-73)

SEX DISTRIBUTION CHART

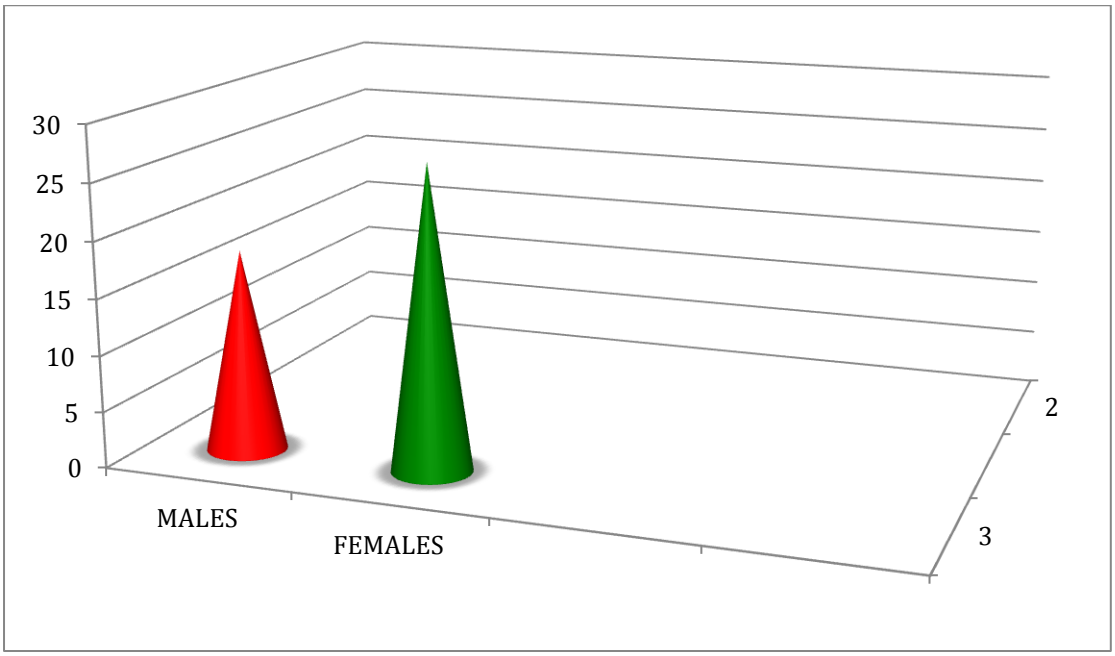


Table 2: Sex distribution

Sex	Number of patients	Percentage
Male	18	40
Female	27	60

Male: Female = 2:3

In all patients primary cemented THA were performed using Liverpool approach. All swabs sent for microbiological study during surgery were reviewed. None of the cultures revealed any growth both in aerobic or anaerobic medium.

DISTRIBUTION CHART ACCORDING TO GARDEN'S CLASSIFICATION

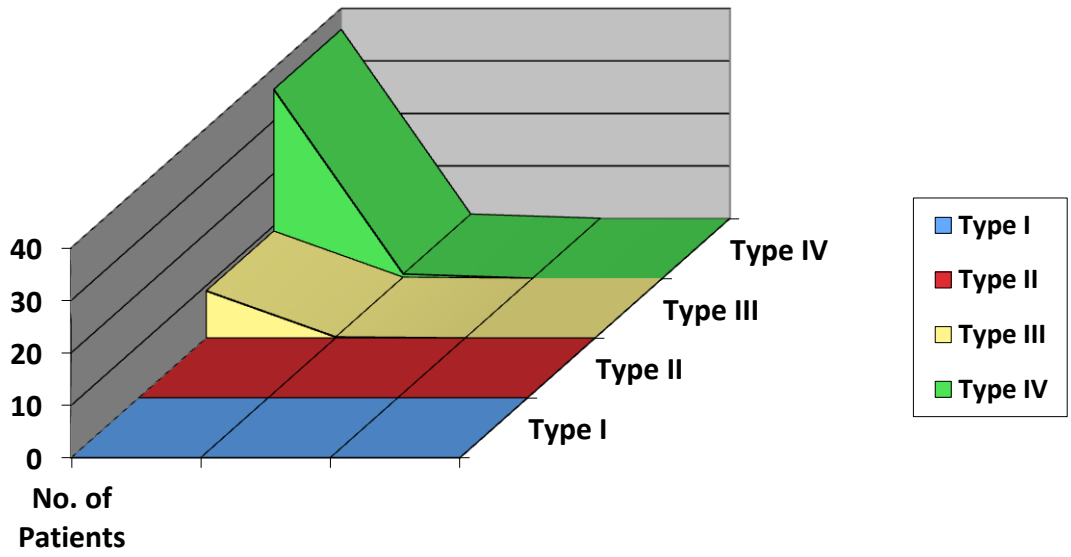


Table 3: Distribution according to Garden's classification

Garden	Number of patients	Percentage
Type I	0	0
Type II	0	0
Type III	9	20%
Type IV	36	80%

There were no Garden type I or II fracture. Majority (80%) of the fractures were completely displaced, Garden type IV fractures.

FOLLOW UP

All patients were followed up personally at 2, 4, 8, 12 weeks, 6 months and 1 year after surgery.

Patients were assessed clinically and radiologically. Direct question were asked regarding pain, mobility, use of walking aids, use of public transport and ability to drive an automobile. Limb length discrepancy was noted. Average preoperative shortening was 2.13cm (range 1 – 4 cm).While 37 patients had an equal limb length post operatively, 8 patients had an average shortening of 1.1cm (range 0.5 – 2 cm).

ANALYSIS

CLINICAL RESULTS

Excellent results were seen in 17 patients, good results in 24 patients and fair results in 4 patients. No poor results were seen.

Results were evaluated according to the Harris Hip Soring Pattern.

CLINICAL RESULTS CHART

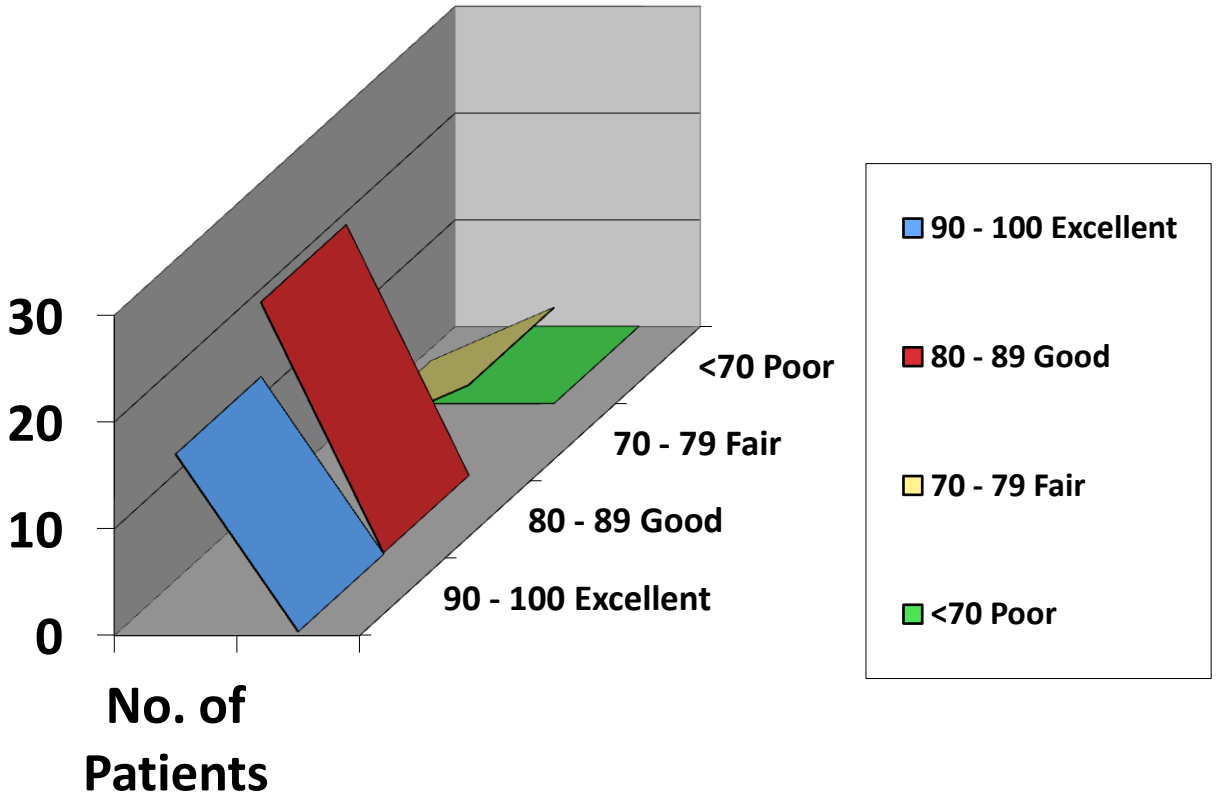


Table 5: Clinical results

Score	No. of patients	Percentage
90-100 Excellent	17	38%
80-89 Good	24	53%
70-79 Fair	4	9%
<70 Poor	0	0%

Average *Harris* hip score was 84.6 (range 76-94) at the last follow up with 91% of the hips having a good or excellent results. All the fractures were fresh except for two cases that had a 1½ months and 4 month old fracture respectively. The lowest score of 72 was seen in the case who had a prolonged ICU stay because of COPD (negative for PE).

Pain and Limp

Till the last follow up 3 patients (6%) had slight or occasional pain, which was not related to activity, did not limit function and disappeared with rest. One patient had mild pain with unusual activity for which she took analgesics like tramadol. No patient took regular analgesic or complained of moderate to severe pain so as to limit ordinary activity or work. 9 patients (20%) had slight limp and 1 patient (2%) had moderate limp at the last follow up.

Walking aids

5(11%) patients were using a single cane in the opposite hand 8(17%) used it occasionally only when walking for long distance. 1(2%) patient was using a walker for support.

Rehabilitation

All the patients were operated within an average of 3.1 Days and were discharged within 5 days post operatively.1

patient had a prolonged ICU stay because of COPD related issue but was negative for PE. All of the patients were mobile with or without support. 7 patients used public transport or drove an automobile.

Associated injury

3 patient (7%) had an associated fracture of the lower end radius of the same side. One (2%) patient had fracture of the greater trochanter.1(2%) patient had associated rib fracture.

Pre Operative Activity

All the patients enjoyed unrestricted activity before the operation.

Associated medical conditions

25 patients (56%) had hypertension. 17(38%) were diabetic 6(13%) had renal disease 3(7%) had-undergone stenting/coronary bypass and were on anti coagulants.

Movements

The movements at the affected hip were recorded till the last follow up. There was average flexion of 84^0(80* - 90°) Abduction of 26° (20°-30°) Adduction of 21^0(15^0-25^0) Internal rotation of 10°(5°-15°) external rotation of 32.5°(20°-40°).

RADIOGRAPHIC RESULTS

3 patients had radiological signs of preoperative hip osteoarthritis. Post operative radiographs showed that the

orientation of femoral component was neutral in 37hips(83%), valgus in 5 hips(10%), and slightvarus in 3 hip (7%).

Average acetabular inclination was 43°(35-55°)

No radiolucent zones, no horizontal or vertical migration of the cup or change in its inclination was seen till last follow up. No vertical migration of the femoral stem or change in its position was seen till last follow up.

Radiolucent zones were seen around 7 femoral components with no signs of definitive loosening. These radiolucent zones were non-progressive till the final follow up.

Complications

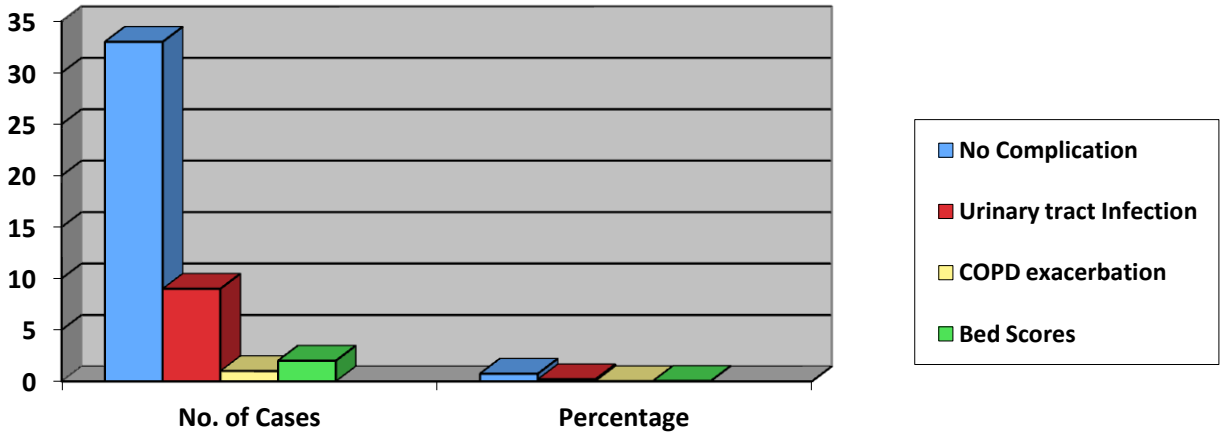
Nine patient (20%) developed urinary tract infection in the post operative period which responded to antibiotics according to culture sensitivity. 2 patients (4%) developed grade II bedsores. 1 patient, a known case of COPD developed post operative acute exacerbation of COPD and had a prolonged ICU stay. He was not diagnosed as PE and recovered satisfactorily. No other medical conditions like deep vein thrombosis, myocardial infarction, cerebrovascular accident etc. were seen.

Table 6: Complications

A. General

Complications	No. of cases	Percentage
No complication	33	74
Urinary tract infections	9	20
COPD exacerbation	1	2
Bed sores	2	4

COMPLICATION CHART

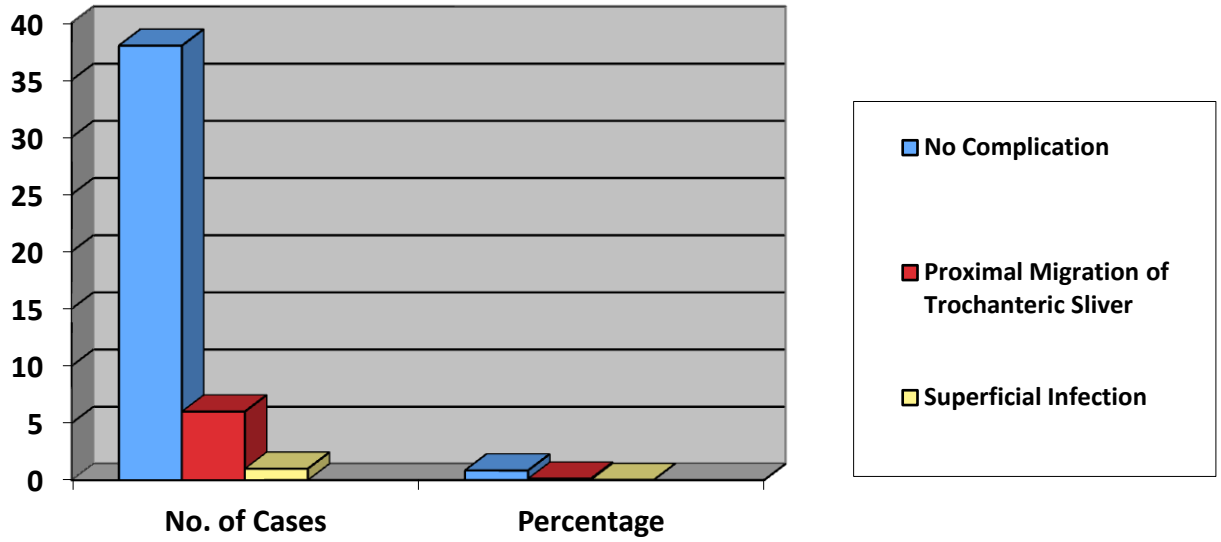


No other complications like bronchopneumonia, cardiac failure, pulmonary embolism, coronary occlusion, fat embolism, paralytic ileus or cerebrovascular accident were seen.

B. Local

Complications	No. of cases	Percentage
No complication	38	85
Proximal migration of trochantric sliver	6	13
Superficial infection	1	2

COMPLICATION CHART



No other local complications like deep infection, dislocation, heterotopic ossification, loosening or migration of cup/stem were seen.

DISCUSSION

Total hip arthroplasty in selected patients was performed as a primary procedure for fracture neck of the femur. 45 such cases were followed up and evaluated clinically and radiologically. The indication for hip replacement in all cases was displaced femoral neck fracture in otherwise active individuals above the age group ranged from 60 yrs-75 yrs with average age of presentation being 67 yrs.

In our study, the follow up period ranged from 2 weeks to 1 year with a mean duration of 7 months. All patients were alive at the last follow up. *Coates and Armour*[22] had reported a mortality of 29%, 7% were known to ' have died in the first month mainly due to medical complications like Ischemic heart disease, pulmonary embolism and septicemia complicating wound infection. In the later studies mortality reported was significantly reduced, *Taine and Armour* 3% at one month 10% at 6 months (1985), *Delamarter and Moreland*[27] 12% at one year (1987), *Gebhart* et al report a 0% in hospital mortality (1991)

This has been attributable to advances in anaesthesia and critical care medicine and improvement in medical facilities.

Average delay between admission and operations was 3.1 days. This delay was unavoidable as many patients had associated medical condition which required evaluation and stabilization before surgery. In older patients, stability of secondary conditions (cardiac, renal, pulmonary) must take precedence over treatment of a femoral neck fracture, so that mortality can be decreased.

All the operations were performed in a conventional operation theatre under antibiotic cover. No deep infection was detected.1 superficial infection was noted in a diabetic patient which settled with suitable antibiotics in 3 weeks. This suggested that prophylactic antibiotic significantly reduced the rate of sepsis in conventional operation theatre. This was based on the studies in

favour of the use of systemic antibiotics, in orthopaedic surgery, by *Bryan et al. Wilson* et al reported significant decrease in infection rate, when prophylactic antibiotics are used, from 11 to 1% *Nelson and Phillip* reported an infection rate of 5.8% in a conventional operating room without the use of antibiotics and of 1.3% with the use of antibiotics; infection rate was 0.6% in the laminar flow room.

Numerous approaches to the hip joint have been described, each claiming to have an advantage over the other. We have used the Liverpool approach based on the anatomical observation made by *Macfarland and Osborne*[38], that gluteus medius and vastus lateralis are in direct functional continuity. *Charnley* recommended osteotomy of greater trochanter, for better visualisation of acetabulum and operative field. *Liverpool* approach gives a good view of the hip joint, is carried out through a smaller incision with minimal blood loss and reduction in operative time, decreasing the incidence of infection and reduced rate of posterior dislocation. Disadvantages include delayed rehabilitation, residual abductor weakness and limp.

According to the *Harris hip score* 91% patients had good to excellent results in our study.*Taine and Armour* had reported 70% good or excellent results *Gregory et al*[2]reported a mean Harris score of 83 with 6 patients having poor results (Score <70). But in 4 of these cases this was due to factors other than the hip itself.

Only 6% patients complained of hip pain with no patient requiring regular analgesics. *Coates and Armour*[22] reported 89% patients to be pain free or having mild pain whereas 11% had severe pain which limited function and for which patients required regular analgesics. Delamarter and Mooreland reported 76% patients to be pain free following the operation.

Limp was seen in 22% of the patients till last follow up. Six of these patients had a proximal migration of trochanteric sliver.. Limp can be explained on the basis that abductors were elevated leading to shortening of the abductor lever arm.

No subsidence or migration of the femoral or acetabular components was seen. There was no change in the orientation of the femoral or acetabular components till last follow up. Radiolucent zones were seen around the femoral component in 7 cases which were non progressive till last follow up.

Radiolucent shadows in all the above cases occupied <50% area at the bone cement interface. *Greenough and Jones (1988)* [43] reported that 32% of the hip which underwent a total hip arthroplasty for fracture neck of femur had been revised nd 16% were awaiting revision. 25% of these had definite radiological loosening of the femoral components. *Gebhardt et al*[31] reported 2-3% revision rate (1991). *Taine and Armour* had reported revision rate for femoral loosening of 3% which could be attributed to the design of *Muller* curved stem prosthesis and primitive cementing technique used.

Medical complication like UTI and bedsores were seen in 26% of the patients which is similar to reported by other authors like *Taine and Armour* (30%).

Around 31% of the patients were using walking aids, most of them a cane, in the opposite hand. On direct questioning many of them actually used the cane occasionally, outside their home more so as a safety measure. Moreover many elderly patients do need some kind of support even otherwise. *Coats and Armour*[22] reported that 52% patients walked with the aid of a stick after operation. *Delamarter Mooreland*[27] reported 36% patients required some support Patients in *Gibhardt et al*[31] study did not use walking aids.

None of the patients in our study had complications of immobilization like deep vein thrombosis, pneumonia atelectasis.Only two patients developed grade II bed sores which healed on mobilisation. Early full weight bearing with a total hip replacement was the main reason for the significant reduction in these medical complications.

A literature review showed about 10-12% dislocation rate in primary THA done for fracture neck of the femur, which is one of the reasons preventing orthopaedic surgeons worldwide to go for a primary THA in this fracture. None

of the patients in our series had a dislocation. We attribute this to clean and minimal soft tissue dissection, maintenance of proper soft tissue tension, proper neck length and adequate closure of capsule and soft tissues after prosthesis implantation. Rate of dislocation reported in various series was *Coates and Armour*[22] 8%, *Sim and Stauffer*[25] 10.7%, *Cartlide*[44] 14.6%, *Taine and Armour* 12.3%, *Dorr et al* 18% and *Greenough and Jones*[43]8%.

Also the use of Liverpool approach reduced the risk of dislocation as compared to posterior approach which is known to be associated with a high dislocation rate.

Proximal migration of trochantric sliver was seen in six patients. These patients scored fair in the clinical rating and had a poor abduction mechanism as was evident by a positive *Trendelenberg* test. These cases were managed by maintaining the Limb in wide abduction and abductor strengthening exercise.

An average of 1.1 cm of post operative shortening was found in 8 cases but was not significant and most of the patients were comfortable without a shoe raise.

Major objection worldwide for doing primary total hip arthroplasty in fracture neck of the femur is a high rate of dislocation. With good surgical technique and experience, the above complication is avoidable as shown in our series. None of our patients had dislocation. Therefore we consider primary THA to be a viable option for treatment in a selected group of previously independently mobile who are older than their physiological age.

CONCLUSIONS AND RECOMMENDATIONS

Our study aimed at assessing the clinical as well as radiological results of primary total hip arthoplasty done for fracture neck of the femur in elderly patients[46].

- Age at the time of surgery was greater than 60
- All fractures were garden T*ype III and IV*[47]
- All patients were preoperative mobile independently enjoying unrestricted activity[48].
- Excellent results were obtained in 38%, good results in 53% and fair results in 9%. None of the patients had a poor result.
- 91% of the patients were pain free and independently mobile at the last follow up.
- No acetabular or femoral component loosening / migration were seen. This was attributed to proper cementing technique.
- Dislocation did not occur in any patient
- Mortality till last follow up was nil
- None of the patients developed deep sepsis
- None of the patients developed pneumonia, atelectasis, DVT. This was attributed to early mobilisation and early full weight bearing

- Proximal migration of trochanteric sliver was found in 13% of cases

- Distal femoral cortex was perforated in none of cases

Thus cemented THA is a very useful procedure for the primary treatment of femoral neck fractures in elderly[49]. This procedure markedly improves the functional status[52] of the patient in terms of early mobilisation, avoiding the complications of prolonged immobilisation[57].

Prosthetic replacement has become established as the standard of care in elderly patients with displaced femoral neck fractures. While surgeons have traditionally preferred hemiarthroplasty to THR[58, 59] , the current level of evidence does not show superiority of one over the other. THR scores over hemiarthroplasty in terms of major reoperation rates, functional outcome and residual pain while hemiarthroplasty is better in terms of dislocation rates[60].

- Prosthetic replacement has become established as the standard of care for elderly with fracture neck femur

- Traditionally hemiarthroplasty preferred in patients without evidence of arthritis

- Emerging evidence[61] in favour of primary THR in view of better function and lower reoperation rate

- Large size head and anterolateral approach may reduce dislocation rates with THR[61]

Longer follow up studies are recommended to assess the hip function, implant survival and complication related to wear and loosening in the long term.

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