

Evaluation of treatment of fracture neck femur with uncemented bipolar prosthesis

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Abstract

Background: The Incidence of Femoral Neck Fracture is On an Increase. Despite Marked Improvement in Implant Design, Surgeon technique and Patient Care, This Fracture Still remains the Unsolved Fracture. In the elderly replacement arthroplasty is better option in View of critical blood supply of femoral head, osteoporosis, prolonged immobility in elderly patient Considering the social economic status, cost factor, demand of squatting and sitting cross legged, operating conditions, Bipolar arthroplasty whereas can be conducted even in remote areas, is cost effective, result even at the hand of general orthopedic surgeons are good and does not change much the life style of Indian population.

Material and methods: All patent above the age of 55 years suspected of having an intracapsular fracture of the femoral neck coming to the casualty were considered for this. Detailed history of the mechanism of the injury, associated injuries Anteroposterior X- rays of the hip and lateral x-rays were taken presence of absence of osteoporosis were noted. Also the part of the neck remaining above the lesser trochanter was noted, Bipolar Prosthesis was used, Lateral Position was given and Moore's approach was used. **Results:** In the Presence Series total no of cases were 50 of which mean age of patient were 60 years and mean follow-up was 2 years, The mean post operative Harris hip score was 84 points, 50% of cases were excellent out come with no pain no limp with normal life style. **Conclusion:** Bipolar prosthesis could be used as replacement arthroplasty in intracapsular fracture neck femur on a larger scale ensuring early mobilization and ambulation of elderly patients.

Key Word: fracture neck femur, bipolar prosthesis, calcar, hip score.

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INTRODUCTION

Fracture of femoral neck is one of the commonest problems that an orthopedic surgeon has to face in everyday life. It most often affect the elderly and has a tremendous impact on the health of the individual and the society in general. As the population's ages, the incidence of femoral neck fracture is on an increase. Despite marked improvement in implant desing surgeon

technique and the patient care, this fracture still remains the unsolved fracture as was called many years ago by Dickson and nicoli (1953 and 1963). The surgical still faces a dilemma regarding various option of internal fixation replacement hemiarthroplasty. The critical blood supply of the femoral head and the wide displacement of fracture fragments combined with the osteoporosis present in the elderly make replacement arthroplasty a better option. It also decreases the need of prolonged immobility and recumbence in senile patients.

Hip joint capsule is strong fibrous sheath that enclose femoral head and most of its neck. Capsule is attached interiorly at the intertrochanteric line, posteriorly however the lateral half of femoral neck is outside the capsule.

- That portion of femoral neck within the capsule has no cambium layer. There for healing of the femoral neck area is dependent on end steal union
- Synovial fluid can lyses the blood clot formation of cell and scaffolding that would allow the

vascular invasion of the femoral head. hence more chances of non-union

Arterial Supply of proximal End of Femur

- 1) Crock described the arteries of the proximal end of femur in three groups.
- 2) Ascending cervical branches of extracapsular arterial ring on the surface of femoral neck.
- 3) Arteries of the round ligament

Biomechanics of Bipolar Prosthesis

The Various parts of the bipolar prosthesis includes:-

- 1) Femoral stem(2types)
Moore's Type or Fenestrated
Thompson type or non-Fenestrated
- 2) Collar
- 3) Neck
- 4) 22 mm spherical bearing
- 5) Bearing insert made of ultra high molecular weight polyethylene (UHMWP) locked into the 22 mm spherical bearing. This produces a low friction universal joint
- 6) Metallic cup or cap i.e "Head"

It caps the polyethylene bearing: it constitutes a strong bearing surface mating with the acetabulum. There are segmental slots incorporated into the liner which provide for self-lubricant by body fluids.

Talwalkar's bipolar prosthesis

Talwalkar bipolar prosthesis was developed by eminent orthopedic surgeon, Dr AK Tawalkar to suit the Indian condition. It incorporates the slandered principal laid down by Dr. bateman. It is a single unit component, Which consist of a stain steel femoral head captive in high density polyethylene cup stem are of two types:-

- 1) Austion Moore type of stem--- Fenestrated and indicated, specially if cal car is 1.3cm for seating.
- 2) Thompson type of stem: on-Fenestrated and indicated, when cal car portion of neck is deficient

In hard top prosthesis hard metal top is there over polyethylene cup to avoid any reaction as experienced in soft-top prosthesis. It is available from size ranging from 37, 39, 41,43,45,47, and 49-mm depending upon diameter of cup. Thus in bipolar prostheses maximum movement is said to occur at the inner interface with movement at interface occurring only in extreme range of movement of flexion and abduction.

MATERIALS AND METHODS

All Patients above the age of 55 years suspected of having an intracapsular fracture of the femoral neck neck

coming to the casualty were considered for this study. A detailed history of the mechanism of the injury and the timing of the same was taken. Assosiated injuries were looked for, the general condition of the patient was taken into consideration. Emergency treatment in the form of analgesics and sedatives were given. Any life threatening injuries were given priority in treatment. The clinical diagnosis of displaced femoral neck fracture usually does not present any difficulty. The finding of external rotation shortening and history of inability to get up after a fall are sufficient to arrive at a diagnosis. Anteroposterior X rays of the hip with leg in maximum degree of internal rotation and lateral x-rays were taken. The type of fracture, the degree of posterior communication and the presence or absence of asteoporosis was noted in the radiographs. Also the part of the Neck remaining above the lesser trochanter was noted. Chest radiograph of patent with cough and patient who were chronic smoker were done.

Choice of prosthesis

Bipolar prosthesis was used in patient in whom there was one half to three fourth inch of remaining femoral neck above the lesser trochanter. Prosthesis size is taken on the x-ray pelvis with both hips, size of the head (in mm) minus 10% magnificent of the x-ray radiation will give us the gross idea of the prosthesis size. Accurate size will be decided intraoperatively with head gauge.

Clinical Examination General examination Systemic Examination -of cardiovascular, respiratory, abdominal and central nervous system Local Examination of hip Hematological and Biochemical Test Special Investigation, Radiological investigations Pelvis with both hip antero-posterior view Radiograph of hip joint with upper one third of femur lateral view Chest X-Ray poster-anterior view

Position: Lateral position was given to patient with sand bags

Exposure by moore's approach

Preparation of femoral shaft

Introduction of prosthesis with maintaining version and reduction done. Capsule was sutured and rotator resutured.the wound was then closed in layer and dressing done over closed suction drainage.

Routine Post-Operative regime Followed

The follow -up were done at regular interval of 1, 2, 3,6,12 and 18 month 2 years 3 years and 4years post-operatively and result were tabulated as per harris Hip Score (1969).Follow -up included radiographic to assess diminishing joint space, acetabular erosion, proximal migration and protrusion of the acetabulum. lossening subsidence and angular shift of the femoral stem were also assessed on radiographs.



OBSERVATION AND RESULT

A total no of 50 cases were studied .There were 24 Males and 26 females in the age ranging From 55 to 80

Table 1: The age Distribution of the patient was as follows

Age Group(in years)	No. of cases
55-60 years	15
61-65 years	15
66-70 years	10
71 onwards	10
Total	50

Table 2: The side involvement

Total	Right	Left
50	18	32

Table 3: The Associated injuries and diseases were noted (in present study)

Associated injuries/diseases	No. of cases
Fracture lower end radius	5
Diabetes mellitus	4
Ischemic heart disease	5
Hypertension	7
Old Bronchitis with emphysema	2

Table 4: Mechanism Of injury

Mode Of injury	No. of cases
Road traffic Accidents	13
Trivial trauma	37
Total	50

Table 5: Harris hip score

Grade	No. of cases	Percentage
Excellent	25	50%
Good	20	40%
Poor	5	10%
Total	50	100%

In the present study 66% Females patient affected with fracture neck of femur. As compared to 44% of male patient. Mean age of patient was 60 years(RANGE 55 TO 65 YEARS). The mean follows –up was 2 years (range 1-4 years). The mean post operative harris hip score was 84 point. None to slight limp was seen post operatively in 26

patient and 4 patient has moderate limp. 27 patients were using cane for walking. Post operative limb length discrepancy in the form of lengthening of 1 to 2.5 cm.was noted in 3patient and shorting of 1 cm in one patient. Complication are Calcar fracture in 2 patient, Superficial infection in 2 patient, Deep infection in 1 patient and Settling in 1 Patient

DISCUSSION

The goal of an orthopedic surgeon in management of hip disorder is a pain free hip with adequate strength and mobility to permit normal activities and function. This is what a patient also expect from surgeon. This factor are somewhat subjective and therefore various method have evolved over the years as to assess the result of joint replacement(d’Aubige&Postel,1954;Larson rating scale, 1963;Harris Hip score ,1969 and Mayo Hip score,1985), but none is perfect(Bryant et al, 1993).the reason for this of joint replacement this may be the complex phenomenon of human locomotion, demanding co-ordinate action of musculoskeletal component through conscious and subconscious neurological control and feedback mechanism. Likewise, there is an ongoing debate regarding use or not to use cement while fixing the stem in femoral canal. Proponents of each have their own views regarding merits and demerits but certain obvious point can be made from thereof. Cement less fixation has an advantage for obtaining a permanent fixation with bone which does not deteriorate with time. Secondly, in cement less fixation loosening is accompanied by bony formation. Undoubtedly, the objective value of any surgical procedure is judged by the clinical result obtained. Mean Age of patient in treating fracture of neck of femur by lestrang(1990)was 79.67 years(53-97 years) in the present study, mean age of patient was 60years(range 55-65 years) .It is evident that, relatively younger patient were treated by bipolar prosthesis. The average hospital stay post-operatively in study by Lestrange(1979)was 21 days; by drinker and Murray (1979) was 23 days and by lestrange (1990)was 10.90 days.The average hospital stays in a study by Gallinaro et al (1990)was 2 weak,whereas ia study by Cornell et al (1998)was 13.4 days. In the present study,average

hospital stay post –operatively was 10 days which is comparable to other studies. The mean follow up period in a study by Bowman et al(1985) was 3.8 years(range 1-7 years) for various hip disorder. The mean follow up in a study by Mess And barmada(1990) was 2.6 years (range 1-7.5 years) for osteonecrosis of hip. The Mean follow-up in study by Malhotro and Bhan(1998)was 6 month for Femoral neck Fracture. In the present study, the mean follow-up was 2 years (Range 6 month To 5 years. The Mean Post –operative Harris hip score in a study by Drinker and Murray (1979) for fracture of the neck of femur was 77.5 with mean follow up of three years. The mean post – operative score in a study by Mannarino et al (1986) was 84.7 points in treating various hips disorder. In the study by LaBelle et al (1990), was 80 points. In the present study, the mean post-operative harris hip score was 80 points. In the study by LaBelle et al (1990), 79.2% Patient had no or slight pain 10.4% had moderate pain, 8.3% had disabling pain and 2.1%had infection. In the present study, 88.9% patient had no or slight pain which is comparable to literature with 11.1% patient with moderate pain there was no patient with severe or disabling pain.

CONCLUSION

A review of 50 cases of intracapsular fracture neck femur treated with bipolar replacement in presented here. The result has been compared with some of the standard series and found to be excellent. Thus operation could be applied on larger scale ensuring early mobilization and ambulation of elderly patient in whom recumbence is detrimental. The complication associated with this operation can be avoided by proper selection of cases, good preoperative planning, and good surgical skill with awareness regarding proper postoperative physiotherapy. Result obtained in experienced hands is absolutely satisfactory with minimum complication.

REFERENCES

1. Anderson BJB Hip Assessment: Comparison between nine different method JBJS, 54-b: 621,972.
2. Apley AG, Lewis Solomon fracture, 6th ed, Bosworths, 439-42
3. Barmada R, mess D Bateman hemiarthroplasty component disassembly: A report of three cases of high density poly ethylene component disassembly
4. Basu AK, Asonal Talwarkar's endoprosthetic replacement of hip in the management of subcapital fracture neck of femur. IOJ, Vol.20, No.2, July 1986
5. Bateman JE Editorial comment. clin orthop, 251:2, Feb 1990 Bateman JE Single-Assembly total hip prosthesis preliminary report clin orthop 251:3, Feb 1990
6. Bateman JE, Berinji Ar, Bayne O, Greyson D long term result of bipolar Arthroplasty in osteoarthritis of the hip. clin ortho, 251:54, Feb 1990

7. Bryant MJ, Kernohan WG, Nizor JR, Mollan Rab Astatical analysis of hip scores. JBJS, 75(B):705, 1983
8. Charnley J Total hip replacement by low friction arthroplasty. clin orthop 72:2, 1970
9. Chen TH, Huang Ck, Chen Wm, Chiang CC, Lo W H heterotopic ossification after cemented or uncemented Bateman bipolar hemiarthroplasty. cheng-Hua-tHserch-Tsachih-Taiperi, 61(9):520-3, sep 1998
10. Gallinaro P, Tabasso G, Negretto R, Elena M Brach Del Prever Exprince with nipolar prosthesis in femoral neck fracture in the elderly and Debilitated .clin orthop, 251:26, feb 1990
11. Giliberty Rp Hemiarthroplasty Of the hip using a low friction bipolar endoprosthesis. Clin orthop, 175:86, 1983
12. Giliberty Rp Anew concept of abipolar endoprosthesis. as Qoted by Mcconville et al : Bipolar hemi-arthoplasty in degenerative arthritis of the hip clin orthop, 251:67, feb 1990.
13. Hey-Groves EW As quoted by Mishein etal: Transcervical fractures of the hip treated with the Bateman Bipolar prosthesis. clin ortho, 251:48, Feb 1990
14. Higgins Rw Quoted by Mcconville et al :bipolar Hemi-arthoplasty in degenerative arthritis of the hip .clin ortho, 251:68, 1990
15. Kindsfater KA, Spitzer Al, Schaffer JL, Scott RD Bipolar hemiarthroplasty for primary osteoarthritis of hip :A review of 41 cases with 8 to 10 year of follow up. orthopedic, 21(4):425, Apr 1998
16. Lenard W labelle, clolwill jc Swanson AB Bateman bipolar hip arthroplasty for femoral neck fracture:A 5-10years follow study. clin orthop, 251:20, feb 1990
17. Lestrangle NR the Bateman UPF prosthesis:A48-month experience orthopedics, 2:4, 1979
18. Lestrangle Nr Bipolar arthroplasty for 496 hip fracture clin Orthop, 251:7, Feb 1990
19. Long JW, Knight W Bateman UPF prosthesis in fracture of femoral neck clin orthop, 152:198, 1980
20. Longchan P the Giliberty bipolar prosthesis clin orthop, 141:169, 1979
21. Malohtra R, Arya R Bhan S Bipolar hemiarthroplasty in femoral neck fracture Arch ortho Trauma Surg, 114(2):79-82, 1995
22. Maricevic H, Frceg M, Gekic K Treatment of femoral neck fractures with bipolar Hemi-arthoplasty. Lijec Vjesn, 120(5):121-4, May 1998
23. Mcconville OR, Bowman Kr A, Kilfoyle RM, Mcconville JF, Mayo Ra Bipolar Hemi-arthoplasty In degenerative arthritis of hip:100 consecutive cases. clin orthop, 251:67, Feb 1990
24. Mess D, Barmada R, Munoz F, planer d (quoted by labelle et al :bateman Bipolar Hip Arthroplasty for femoral neck fracture. clin orthop, 251:20 Feb 1990
25. Mess D ,Barmada R Clinical and motion studies of the Bateman bipolar prosthesis in osteonecrosis of the hip. clin orthop 251:44, Feb 1990
26. Murziec WJ, McCollum DE hip arthroplasty for osteonecrosis after renal trans plantation clin orthop, 299:212_19 Feb 1994
27. Nagai L, Takatori Y, Kuruta Y Moro T, Karita T, Mabuchi A, Nonsel-centering Bateman bipolar endoprosthesis for nontraumatic osteonecrosis of the femoral head: A 12 to 19 years follow-up study orthopSci, 7(1):74-8, 002

28. Nottage WM, McMaster WC Comparison of bipolar implants with fixed-neck prosthesis in femoral neck fracture. *clin orthop*, 251:338, Feb 1990.
29. Pauwels FP As quoted by Campbell: operative orthopaedics, 9th ed, Vol.1.
30. Phillips TW, Rao Dr. Bateman bipolar hips with autologous bone graft reinforcement for dysplastic acetabula. *clin orthop*, 251:104, 1990
31. Prieskorn D, Burton P, Page BJ 2nd, Swienckowski J bipolar hemiarthroplasty for primary osteoarthritis of the hip *orthopedics*, 17(12):1105-11, Dec 1994
32. Rydell NW forces acting on the femoral head prosthesis. a study on strain gauge applied prosthesis in living person. *acta orthop scand* 88(37:suppl):1, 1996
33. Watson Jones injuries of the hip in fracture and joint injuries 6th ed, Vol. II, BI Church Hill Living stone ltd, 1992, 878-973, reprint 1998.
34. Weber BG total hip replacement with rotation endoprosthesis (Trunnion-bearing prosthesis). *clin Orthop*, 251:7, Feb 1990
35. West WF, Mann RA (Quoted by lestrange-bipolar arthroplasty for 496 hip fracture. *Clin orthop*, 251:7, Feb 1990)
36. Yamamuro T, Toyoji Uo, Hideo Okumura, Lida H, Hamamoto T Five Year Result of bipolar arthroplasty with Bone Grafts and reamed acetabular for osteoarthritis in young adults. *Clin orthop*, 251:75, 1990.

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