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RESULT OF PRIMARY HEMIREPLACEMENT ARTHROPLASTY IN CASE OF UNSTABLE TROCHANTERIC FRACTURE IN ELDERLY

Orthopedics

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ABSTRACT

BACKGROUND- Intertrochanteric fractures are very common among the elderly age group people. In stable type it can be managed without much controvery but problem lies in managing the unstable fracture pattern. Aim of the study is to analyse the result of hemireplacement arthroplsty in unstable trochanteric fracture in elderly mobilising early avoiding complications of immobilisation.

MATERIAL & METHOD- Total 30 patients were included in the study & calcar replacement hemiarthroplasty done among them. Result were analysed post operatively on the basis of Harris Hip Score, infection & complications.

RESULT- Results were analysed on the basis of Harris Hip Score calculated pre-op, 6wks , 6mnth, 1yr post op. Significant improvement seen with negligible complications.

CONCLUSION- Calcar replacement arthroplasty is a good treatement option in unstable trochanteric fractures in elderly.

KEYWORDS:

elderly patients, unstable trochanteric fracture, hemiarthroplasty

BACKGROUND :- Intertrochanteric fractures in elderly is a frequent problem & is becoming more common as proportion of elderly person is increasing [1].The worldwide annual number of hip fractures in 1990 were 1.66 million [2],with an expected incidence of of 6.26 million by the year 2050 [2]. Low-energy trauma (fall <1 metre) caused 53% of all fractures in the persons of 50 years & older.In those above 75 years ,low energy trauma causes more than 80% of all fractures [3].This is contributed of course due to osteoporosis [2,3]. Stable fractures can easily be treated with internal fixation with predictble results but problem lies in treatement of the unstable variety mainly because of failure of obtaining good anatomical reduction. Unstable intertrochanteric fractures (first described by Evans classifiction[4]) in the elderly is associated with high mortality rate as much as 20% during the first postoperative years [5,6,7]. The treatement of the such unstable trochanteric fracture is still controversial, despite publication of lots of reports of randomised trials & comperative studies.[8,9,10]. In the past, fixed nail plate devices were used for fixation of these fractures had high rates of cut-outs [11,12] & fracture displacement. Subsequently ,a sliding hip screw was used with much success & became the predominant method of fixation of these fractures [13,14]. Complications like head perforations, excessive sliding leading to shortening, plate pullout & plate breakage continued to be a problem especially with the unstable type of fractures[15,16]. Osteoporosis & instability are one of the most important factors leading to unsatisfactory results[17,18].Also in these elderly patients with osteoporotic unstable intertrochanteric fractures a period of immobilisation is suggested[19,20] which may cause complications like atelectasis, bed sores, pneumonia & deep vein thrombosis. Intramedullary interlocking devices have shown reduced tendency to cut-outs in osteoporotic bones & also have better result in unstable intertrochanteric fractures[21,22].However the role interlocking intramedullary devices in unstable osteoporotic & severly comminuted intertrochanteric fractures is still to be defined. For all of the above mentioned complications & problems some surgeons recommended endoprosthetic replacement for treatement of unstable intertrochanteric fractures in elderly [23,24,25].Prosthetic replacement shown to achieve early rehabilitation & good long term results[23,24,25].The aim is to give early mobilisation & prevention of post operative complications as much as possible.However ideal treatement method is still rather controversial because of poor quality of bone mass, co-morbid disorders & difficulties in rehabilitation in these patients. The purpose of this study is to analysis the role of primary hemiarthroplasty in case of unstable trochanteric fractures in elderly.

MATERIAL & METHODS :-The inclusion criterias of our study were-

1. Age >65 yrs of either sexes.
2. Evan's type II and III trochanteric fractures.
3. Fracture <4 weeks old.
4. Gross posteromedial comminution.

The exclusion criterias were-

1. Compound intertrochanteric fractures.
2. Polytrauma patient.
3. Fracture >4 weeks old.
4. Patient unfit for surgery

In between 2012-2017 we choose total 35 patients satisfying the inclusion criterias presented to R.G Kar Medical College & Hospital. After proper clinical & radiological pre-operative evaluation patients were taken to surgery. Various co-morbid conditions were associated in these group of patients like hypertension, diabetes, copd etc. Proper controlling of these conditions preoperatively were very much necessary to gain the good post operative outcome. Pre operative Harris Hip Score were calculated.

Operative procedure



position & approach

All surgeries were done in elective theatre using standard aseptic precautions. Surgeries are performed under spinal / general anaesthesia after taking proper consent from the patient & his/her relatives.

Position were straight lateral position with the patient lying on the unaffected side.After proper antiseptic dressing & drapping operations were started.

Posterior approach were used.

MAJOR OPERATIVE STEPS



head & neck taken out

After skin incision subcutaneous tissue, gluteus maximus muscle were divided. Then short external rotators & piriformis were divided & tagged with sutures preserving quadrates femoris. Hip joint capsule were incised in T shaped manner. Then the femoral head with attached neck were delivered.



calcar reconstruction

Then comes the most important step of reconstruction of the calcar. Various methods26,27,28 have been described in the literature. Like reconstruction of the greater trochanter using s-s wire. The wire is passed through the abductors & the vastus lateralis. The greater trochanter also can be reconstructed by tension band wiring method or by ethibond suture26,27 in case of severly comminuted fractures. The lesser trochanter is fixed by encerclage technique most of the time.

In our study different types of calcar reconstruction methods were applied. Intraop decisions were taken how to reconstruct the calcar.

First the s-s wire was passed through the abductors & vastus lateralis for reconstruction of greater trochanter. Then the lesser trochanter was reconstructed using encerclage technique.



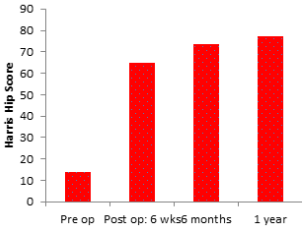
Final pic of reconstructed calcar

Final pic of reconstructed calcarThen the preparation of the femoral canal was done. Cement restrictor was then inserted & the canal was packed. Thereafter the cement was prepared by mixing the polymer with the monomer. After mixing polymer with monomer time was counted & approximately after 3-4 minutes cementing was done using a cement gun after removing the pack. Then the prosthesis stem for modular bipolar was inserted. Initial reduction was done using trial head & final reduction was done using appropriate modular head. Then normal saline wash was taken & wound was closed in layers. In the immediate post op period according to the intra-op stability of the hip joint wt.bearing was allowed using walker either from 3rd post op day or after 2-3 wks

Post op regimen- . Drain removed at 2nd post op day & suture removal done after 2 wks. Patients were instructed to bear wt. at their home & were asked to avoid sitting cross legged & squatting. They were instructed to come for regular follow up & post op Harris Hip Score was calculated at 6 wks, 6 mnths & 1yr respectively. Any associated complications were also noted like abductor lurch, infection & dislocation.

RESULT :- A total 35 patients satisfying the inclusion criterias were included in our study. Among them 3 patients died due to medical reasons & 2 were lost in follow up. Rest 30 patients were followed up at 6wks, 6mnths & 1yr. Harris Hip Score were calculated & any associated complications were noted.

The mean age group of the patients in our study were 75.20±6.05(mean±SD).On evaluating the Harris Hip Score the pre-op mean was 13.87±2.32. Post op 6wks mean was 64.83±1.60 (difference -50.953) & t value -207.195. 6 month post-op mean Harris Hip Score was 73.63±2.70 (difference -59.753) & t value -152.932. Finally the 1 yr post-op mean was 77.06±10.78 (difference -63.187) with a t value of -35.045. In all the cases the p value is <0.001 which is stastically significant (Student t test). There were total 8 patients within age (81-90) yrs. Among them 6 had Evans type III fracture. This is significant in Fisher Exact test (p value=0.070+). One patient had post operative dislocation & 1 patient had post operative infection.



DISCUSSION :- The mean age of patients in our study was 75.20 with standard deviation of 6.05. Age of the youngest patient was 66 yrs & eldest was 86 yrs. 22(70%) patients were between (66-80) yrs & 8 patients(30%) were more than 80 yrs.12(40%) patients were female & 18(60%) were male. Among the 12 female patients 6(50%) had age more than 80 yrs & among the 18 male patients 2(11.1%) had age more than 80 yrs. Total 11(36.7%) patients had lt.sided fracture & 19(63.3%) patients had rt. sided fracture.

Total 12(40%) patients had some of the co-morbidities like hypertension, diabetes, copd etc. This is statistically significant. Among the 8 patients of more than 80 yrs 5(62.5%) had some form of co-morbidities. Higher age group patients had increase no of co-morbidities which significantly influence the future functional outcome. Total 18(60%) patients had Evans type II fracture & 12(40%) had type III fracture. 4 female patients had type II fracture & 8 had type III fracture. Most of the female patients(66.6%) had type III fracture which is stastically significant (p=.024). Among the 22 patients between age (66-80) yrs 6(27.2%) had type II fracture & among the 8 patients more than 80 yrs 6(75%) had type III fracture which is significant (p=.070). Mean age in type II fracture was 72.50 with standard deviation of 4.82 & mean age of type III fracture was 79.25 with standard deviation of 5.55. This signifies higher age group is associated with more comminuted fractures. In our study 12 rt. sided fracture had type II variety & 7 had type III variety. Among the 18 patients of type II fracture 4(22.2%) had some form of co-morbidity but among the 12 patients of type III variety 8(66.7%) had some form of co-morbidity which is statistically significant(p=.024). For calcar reconstruction s-s wire was used in 12(66.7%) male patients, TBW for 5(27.8%) male patients & ethibond used for 5(27.8%) male patients. Among total 18 patients with type II fracture s-s wire used for 11(61.1%), TBW for 6(33.3%) & ethibond used for 1(5.6%).In all 12 patients with type III fracture calcar was reconstructed using both s-s wire & \ ethibond. Higher fracture type need dual modality of calcar reconstruction technique. 17(94.4%) patients among the 18 patients with type II fracture were allowed to bear weight within 5 days after operation,which is stastically significant(p<0.001). On the other hand only 2(16.7%) patients with type III fracture were allowed to bear wt. within 5 days after operation & 8(66.7%) patients with type III fracture were allowed to bear wt. after 20 days of operation. (56.5%) patients in whome s-s wire was used for calcar reconstruction were allowed to bear wt. within 5 days of operation, (83.3%) patients in whome TBW was used were allowed to bear wt. within 5 days post operatively. Mean operating time in type II fracture was 52.22 min with standard deviation of 3.73 & in type III fracture it was 69.58 min with standard deviation of 6.56 which is significant(p<.001). Mean

intra-op blood loss for type II fracture was 349.72 ml with standard deviation of 14.90 & mean intra-op blood loss for type III fracture was 380.83 ml with standard deviation of 9.2 which is significant (p<.001). Higher fracture pattern is associated with more operating time & more intra-op blood loss.

4 patients had immediate post op complication in the form of bed sore, all of them had type III fracture & age more than 80 yrs which is significant (p=.018). Among the 12 patients with type III fracture 10(83.3%) had abductor lurch which is significant(p<.001). 1 patient had infection & 1 had dislocation, both belong to type III fracture. Higher fracture type is associated with more complications. 3(75%) patients with immediate post-op bed sore had some form of co-morbidity & 1 patient with infection also had both hypertension & diabetes. All 4 patients with bed sore post operatively were allowed to bear wt. after 20 days of operation which is significant(p=.009). Delayed wt. bearing is associated with more post op complications.1 patient who had infection treated by thorough wound debridement & a period of i.v antibiotics for 4wks according to the culture sensitivity report. As the infection was superficial & implant was stable implant removal was not done. The patient who had dislocation was treated by open reduction & abduction cast for 4 wks post opearatively. Then the cast was removed & position of the implant was confirmed by x-ray & she was instructed to bea wt.

Mean pre-op Harris Hip Score was 13.87 with standard deviation of 2.32. Mean 1 yr post op Harris Hip Score was 77.06 with standard deviation of 10.78. 27 (90%) patients of our study had pre-op Harris Hip Score between (11-20) & 24(80%) patients of our study had 1yr post op Harris Hip Score between (71-80). Mean pre-op Harris Hip Score with type II fracture was 15.36 with standard deviation of 1.49 & mean 1 yr post op Harris Hip Score with type II fracture was 79.96 with standard deviation of 1.71. Mean pre-op Harris Hip Score with type III fracture was 11.65 with standard deviation of 1.33 & mean 1 yr post op Harris Hip Score with type III fracture was 72.72 with standard deviation of 16.35. This is significant(p=.071+). Higher fracture pattern is associated with less improvement in Harris Hip Score with time. In patients with age <75 yrs the mean pre-op Harris Hip Score was 15.25 with standard deviation of 1.64 & mean 1 yr post op Harris Hip Score was 79.97 with standard deviation of 1.61. In patients with age >75 yrs the mean pre-op Harris Hip Score was 12.09 with standard deviation of 1.84 & mean 1 yr post- op Harris Hip Score was 73.25 with standard deviation of 15.8. This is stastically significant(p=.091+). Patients who were allowed to bear wt. within 5 days after operation had mean 6 wks post-op Harris Hip Score of 65.70 with standard deviation of 1.03 & mean 1 yr post-op Harris Hip Score of 79.97 with standard deviation of 1.6. Patients who were allowed to bear wt. after 20 days of operation had mean 6wks post-op Harris Hip Score of 62.88 with standard deviation of 1.11 & mean 1 yr post-op Harris Hip Score of 69.83 with standard deviation of 19.79 which is significant (p=.170). Patients with younger age group & early post op wt.bearing had better improvement of Harris Hip Score post operatively with time.

Our study had several limitations. The sample size was small (N=35) and the follow up period was only 1 yr. The post-operative rehabilitation was done under supervision only for first 5-10 days before the patients were discharged and it was not possible to determine whether the patients were following the rehabilitation protocol with equal motivation.We also were unable to eliminate the other various patients variable like socio–economic status, physosocial encouragement in our study. Our aim was to find the result of primary hemiarthroplasty in case of unstable trochanteric fracture in elderly & we found this modality of treatement is good option in this type of fracture with good functional outcome.

CONCLUSION :- Total 30 patients were available for evaluation for 1yr.Results were recorded on the basis of Harris Hip Score & various complications at interval of 6 wks, 6 mnths &1 yr.

Most of the patients were reported with satisfactory outcome at the end of the study.

Younger age group patients, male patients had better outcome. Patients with Evans Type II fracture type had better outcome than the type III variety. Female patients specially having some form of co-morbidity had less favourable outcome. A significant relationship between early post op weight bearing & good functional outcome with less incidence of complication was noted. Better the fracture stability better was the future outcome.

Our study was limited in aspects like small sample size, short duration of follow-up with variable patient characteristics. Keeping these in mind we can conclude that primary hemireplacement arthroplasty is a good treatement option in treating unstable trochanteric fracture in elderly patients.

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