

Treatment for unstable intertrochanteric fractures in elderly patients: internal fixation versus cone hemiarthroplasty

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Abstract

Background: The aim of this study is to compare the functional outcomes of the two different surgical modalities, Proximal femoral nail and Bipolar prosthesis in the treatment of the Intertrochanteric fractures of the elderly population. This study also compares the advantages and disadvantages of the two surgical modalities in the intertrochanteric fractures. Patients with intertrochanteric fractures should mobilize early to prevent morbidity and mortality. Bipolar prosthesis offers early ambulation but with increasing surgical time, it had complications and had poor HHS after long follow up. Proximal femoral nail allows late ambulation but offers better HHS score after the long follow up. **Study Design:** Prospective study. **Study Period:** 01/01/2013 - 31/01/2014 **Methodology:** A total of 34 patients between 60 to 80 years who had intertrochanteric fractures operated either with proximal femoral nail or bipolar prosthesis who had fulfilled inclusion criteria. They were divided into 2 groups each with 17 patients. The Harrison Hip score is used for the assessment of the results of survey. **Results:** The data of the two groups are compared. At 9 months, PFN offers a better HHS score than bipolar prosthesis. PFN had mean HHS score of 86.0 at 9 months and bipolar prosthesis had a score of 80.0 at 9 months. PFN had fewer complications when compared to bipolar prosthesis. Pain and range of movements were better in PFN group. 2 patients in bipolar prosthesis group had stem loosening and 1 patient had screw cut out in the PFN group with subsequent pain in the final follow up. **Conclusion:** Proximal femoral nail is a better option and good treatment for the intertrochanteric fractures in the elderly population because of its less operative time, less complications and also good HHS score in the late follow up period. Primary cemented bipolar prosthesis gives better results in unstable intertrochanteric fractures in the elderly with less complications and early ambulation.

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INTRODUCTION

Approximately half of all the hip fractures caused by low energy mechanism are Intertrochanteric fractures. These fractures are more common in elderly population with osteoporosis due to low energy mechanism whereas in

young population, these fractures are due to high energy mechanism. The risk factors of intertrochanteric fractures include:

1. Increased age.
2. Female gender.
3. History of fall.
4. Osteoporosis.
5. Gait abnormalities.

Intertrochanteric fractures along with other hip fractures are a major cause of mortality and morbidity in elderly population. 45% of all the hip fractures were intertrochanteric fractures. The treatment approach is always a controversy in intertrochanteric fractures as most of the population involved were elderly who are often associated with poor bone quality and systemic diseases.

Intertrochanteric fractures can be stable and unstable fractures. Patients with stable fractures and associated

systemic diseases are majorly corrected with intramedullary fixation equipment called proximal femoral nail. Proximal femoral nail (PFN) will restore the neck shaft angle. This is achieved by anatomical reduction of the comminuted fracture and stable fixation by PFN. Patients treated with PFN have advantages like less pain and they could walk better post operatively and they can be rehabilitated better and early.

Elderly patients with osteoporotic bones who have unstable intertrochanteric fractures when corrected by PFN associated with problems like excessive collapse, loss of fixation, cut out of lag screw and result in poor function. To allow an earlier post operative weight bearing and rapid rehabilitation and to avoid excessive collapse at fracture site, prosthetic replacements are suggested for unstable fractures.

METHODOLOGY

This study is a prospective cohort conducted in Department of orthopedics at Great eastern medical school

& hospital Srikakulam from 01/01/2013 - 31/01/2014. A total of 34 patients between 60 to 80 years with intertrochanteric fractures operated PFN or Bipolar prosthesis that fulfilled the inclusion criteria are included in the study.

INCLUSION CRITERIA:

1. Closed IT fractures.
2. Age group of 60 to 80 yrs.
3. All types of fractures under Boyd and Griffith.
4. IT fractures operated with PFN or bipolar prosthesis.

EXCLUSION CRITERIA:

1. Patients not giving consent.
2. IT fractures less than 60 yrs.
3. Seriously ill patients.
4. Patients unfit for surgery.
5. Pathological and compound fractures.

STATISTICAL ANALYSIS:

The Harris Hip score were assessed for all the patients for every 3 months i.e., at 3months, 6months, 9months following the surgeries. These scores are compared.

RESULTS

A total of 34 patients with IT fractures are included in our study. They were divided into 2 group containing 17 patients each. In PFN group, there were 8 males and 9 females. In Bipolar prosthesis group, there were 9 males and 8 females. The average mean age in PFN group is 69.4 and in Bipolar prosthesis group is 70.6.

Table 1

Group	Males	Females	Mean avg age
PFN	8	9	69.4
Bipolar prosthesis	9	8	70.6

Table 2

TREATMENT	TIME OF HHS MEASUREMENT	MEAN HHS
PFN	3 MONTHS	66.4
	6 MONTHS	71.7
	9 MONTHS	86.0
BIPOLAR PROSTHESIS	3 MONTHS	72.8
	6 MONTHS	77.9
	9 MONTHS	80.0

Out of 34 patients, 1 patient died from the bipolar prosthesis group. 1 patient from each group did not follow up later. So, the assessment for the final follow up of 9 months was taken from the total of 31 patients.

The HHS score in the bipolar prosthesis group which is 72.8 is higher than the PFN group which is 66.4 for the initial follow up at 3 months which is statistically significant ($p < 0.001$). The HHS score followed the same trend for the next follow up at 6 months, the values between 77.9 and 71.7 respectively. But the HHS score in the PFN group which is 86.0 is higher than the bipolar prosthesis group which is 80.0 for the longer follow up at 9 months which is statistically significant ($p < 0.001$).

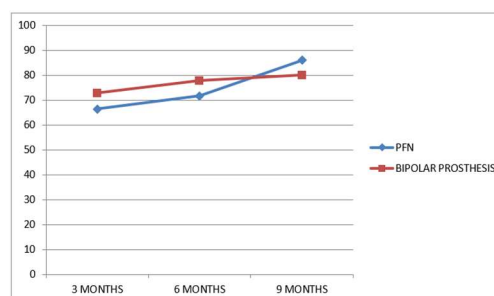


Figure 1: MEAN HARRIS HIP SCORE

The duration of surgery in the bipolar group ranged from 120 minutes to 150 minutes with a Mean of 130.2 minutes. The duration of surgery in the PFN group ranged from 65 minutes to 100 Minutes with a mean of 81.6 minutes. The difference in the operative times in both groups was found to be highly significant.

There is major blood loss intraoperatively in bipolar group than in PFN group due to larger incision and more soft tissue handling. Blood is calculated by the no. of mops used and post op drain. There were 2 patients in the bipolar prosthesis group who developed infection and 1 patient who got infected died after 1 month. There was 1 patient who developed infection PFN group.

Stem loosening and implant subsidence occurred in 2 patients in bipolar prosthesis group. Implant failure was observed in 1 patient in PFN group. Pressure sores developed in 2 patients of Bipolar prosthesis group.

Table 3

POST OP COMPLICATIONS	PFN GROUP	BIPOLAR PROSTHESIS GROUP
INFECTION	1	2
PRESSURE SORES	0	2
IMPLANT FAILURE	1	2
LIMB LENGTHENING	0	1
LIMB SHORTENING	1	2
DEATH	0	1

Patients operated with bipolar prosthesis were allowed full weight bearing on 2nd post operative day. The patients operated with PFN group were mobilized bed side and non weight bearing at 3rd or 4th post operative day. Limb length discrepancy was significant in bipolar prosthesis group with 1 patient having limb lengthening >2 cm and 2 patients having shortening >2 cm. In PFN group 1 patient had >2cm shortening because of varus collapse.

DISCUSSION

The discussion about the ideal implant for the treatment of proximal femoral fractures continues.

According to our study, a combined intramedullary device inserted by means of a minimally invasive procedure seems to be better in elderly patients. The results are also similar to other studies like Rosenblume et al. 1992, Prinz et al. 1996. Fracture hematoma is an essential element in the consolidation process. Closed reduction of the fracture preserves that fracture hematoma.

In intramedullary fixation, there is minimal soft tissue dissection which reduces surgical trauma, blood loss, infection and wound complications. The stress generated on intramedullary implants is negligible as its position is close to the weight bearing axis. The PFN implant also acts as a buttress in preventing the medialisation of the shaft. Reduction in implant stress and fatigue is done by medial buttress. So, the primary restoration of the medial support is not necessary for the healing of fracture. The nail's

position near the weight bearing axis reduces the stress generated on the implant significantly.

Cemented bipolar hemiarthroplasty shows good results according to several studies in the literature. Cemented bipolar hemiarthroplasty not only helps in early mobilization of the patient but also gives good and fast improvement in Harris Hip score. Complications that are common with bipolar hemiarthroplasty like pressure sores, aspiration, pneumonitis are very rare with cemented bipolar hemiarthroplasty. So, it gives better results in comminuted unstable intertrochanteric fractures in terms of early ambulation and midterm survival rates.

The three approaches practiced have comparable dislocation rates. Some studies show that the posterior approach when augmented with adequate soft tissue greatly reduces the relative risk of dislocation. But certain studies also shown that there were higher rates of dislocation with posterior approach when compared with trans-trochanteric and anterolateral approach. Posterior

approach also has less rate of ectopic ossification. Trans-trochanteric approach has higher rates of non-union and can lead to lurching gait.

The clinical results of our study are also similar to other studies like kayali *et al.* which is a comparative study of cone hemiarthroplasty versus internal fixation. Patients treated with hemiarthroplasty were allowed full weight bearing significantly earlier than internal fixation patients. Cone hemiarthroplasty can be used an alternative treatment for unstable intertrochanteric fractures in elderly patients.

The results are also similar to other studies like Sancheti *et al.* who also concluded that hemiarthroplasty for unstable osteoporotic intertrochanteric fractures in elderly results in early ambulation and good functional results.

CONCLUSION

Proximal femoral nail is a better option and good treatment for the intertrochanteric fractures in the elderly population because of its less operative time, less complications and also good HHS score in the late follow up period. Primary cemented bipolar prosthesis gives better results in unstable intertrochanteric fractures in the elderly with less complications and early ambulation. So it can be considered as a treatment modality in the elderly population with unstable intertrochanteric fractures.

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