

# Functional outcome following treatment of intertrochanteric fractures in elderly patients

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## Abstract

Fractures of the proximal femur are among the most often encountered by the orthopaedic surgeons. They account for about 30% of all hospitalisations for fractures. These fractures usually occur in bone affected by osteoporosis, osteomalacia and pagets disease. Implants used for fracture fixation can fail for many reasons including lag screw cut out. Studies however show no significant difference in the role of bone quality in post treatment complications among patients with intertrochanteric fractures. The advantages of intramedullary fixation of pertrochanteric hip fractures over dynamic screw plate devices are still a matter of debate. The functional outcome is dependent on a number of factors including the type of fracture, duration of surgery, post-operative complications, Pre-injury walking ability time of union and post op walking ability. The outcome in such patients can be ascertained with the Harris hip score.

**Keywords:** Harris hip score, Intertrochanteric fracture, Functional outcome.

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## INTRODUCTION

Most fractures occur in elderly, usually in association with osteoporosis<sup>5,11</sup> and as a result of moderate or minimal trauma<sup>6,7</sup>. Intertrochanteric fractures are common categories that usually require open reduction and internal fixation. Intertrochanteric fractures unite if reduction and fixation are properly done. Logistic regression analysis showed that there was no association between mortality rate and surgical delay more than one day after adjusting with the patients' risk factors. The trochanteric femoral fracture is common in elderly patients; with societies growing continuously older, the incidence has increased markedly in recent years. Due to their poor bone quality, it is very difficult to achieve and

maintain a stable fixation in elderly patients. The aim of surgery is to achieve early mobilization and the prompt return to pre-fracture activity levels. The treatment of this fracture remains a challenge to the surgeon. The contribution of the present study to the literature would be to confirm or refute an actual clinical advantage of the proximal femoral nailing for intertrochanteric fractures by evaluating the functional outcome.

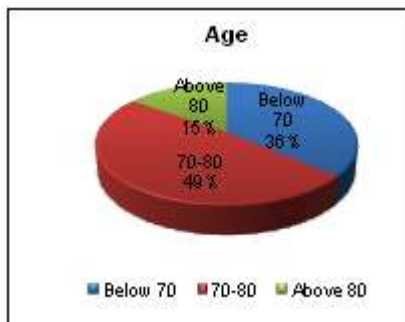
## MATERIALS AND METHODS

Patients who presented to the Department of Orthopaedics in Father Muller Medical College, Mangalore with an intertrochanteric fracture, 33 patients were selected for the study with the inclusion criteria being, patient was independent and mobile before injury, more than 55 years of age, surgically managed by internal fixation (PFN Fixation), exclusion criteria being fractures older than one week, associated pelvic fractures, unable to walk before the fall and Pathological fracture. All the patients were evaluated pre and post operatively. These patients underwent proximal femoral nailing (240mm nails). All the surgeries were performed by the same surgeon and by the same technique. The patients followed a standard rehab protocol with slight modifications depending on the presence of pain and individual patient response. The patients were followed

up at regular intervals with the minimum follow up interval being 6months and 1 year.

**OBSERVATIONS AND RESULT**

This prospective study of patients with intertrochanteric fractures treated with proximal femoral nailing, conducted at Father Muller medical college Mangalore. A total of 33 patients were considered for the study (excluding 3 patients lost to follow up), who underwent proximal femoral nailing and their functional outcome was assessed at six and twelve months. Data collected were statistically analysed and results were drawn using the Fishers Method.



Most of the patients i.e, 48.5% were in the 70-80 age group followed by 15.2% above 80 age group and the remainder in the third subset.

**Table 1: Sex**

	Frequency	Percent
F	26	78.8
M	7	21.2
<b>Total</b>	<b>33</b>	<b>100</b>

**Table 2: MOI**

	Frequency	Percent
FALL	30	90.0
RTA	3	9.1
<b>Total</b>	<b>33</b>	<b>100</b>

Trivial fall attributes to the most common cause in our study.

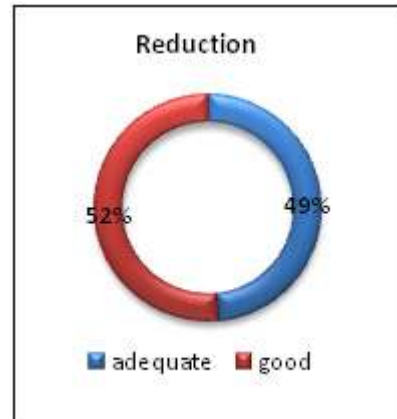
**Table 3: #Type**

	Frequency	Percent
Stable	20	60.0
Unstable	13	39.4
<b>Total</b>	<b>33</b>	<b>100</b>

A stable type of fracture had a better outcome in terms of fixation and final outcome, it was correlated with the adequacy of reduction and union. An adequate reduction is of paramount importance to ensure good healing, early mobilisation and hence better function outcome.

**Table 4: Reduction**

	Frequency	Percent
Adequate	16	48.5
Good	17	51.5
<b>Total</b>	<b>33</b>	<b>100</b>



From our study 52% of the fracture fixations were found to be adequate and had good correlation with a better functional outcome.

**Table 5: Preinjury grade**

	Frequency	Percent
1	27	81.8
2	6	18.2
<b>Total</b>	<b>33</b>	<b>100</b>

- Grade 1 - Walk without support
- Grade 2 - Walk with a cane or minimal support
- Grade 3 - Walk with 2 canes, crutches or living support
- Grade 4 - Confined to bed or wheelchair.

In our study the post operative pain had very little significance to the final end result and functional outcome. 57.6% of patients had mild pain which did not seem to interfere with their ability to ambulate by themselves. Taking into consideration the above parameters, Harris hip score were tabulated at 6 and 12 months.

**Table 6: 6 mth HHS**

	Frequency	Percent
Poor	4	12.1
Fair	8	24.2
Good	13	39.4
Excellent	8	24.2
<b>Total</b>	<b>33</b>	<b>100.0</b>

An excellent outcome was seen in 24.2%, good outcome in 39.4%, fair in 24.2% and poor outcome in 12.1% of patients. The scores were assessed at the end of six months.



**Table 7: 1 yrs HHS**

	Frequency	Percent
Poor	3	9.1
Fair	5	15.2
Good	17	51.5
Excellent	8	24.2
<b>Total</b>	<b>33</b>	<b>100.0</b>

Scores at the end of one year showed 51.5% good outcome, followed by 24.2% excellent outcome, and fair outcome of 15.2%. The age, type of fracture, reduction achieved and Tip apex distance had an important role in determining the functional outcome at the end of one year.

**Table 8: Tip apex distance**

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	33	58	85	72.12	8.506
TAD <25MM ACCEPTABLE	33	15.4	39.0	25.186	5.4655

	Frequency	Percent
Acceptable	20	60.6
Not acceptable	13	39.4
<b>Total</b>	<b>33</b>	<b>100.0</b>

The mean age of the study group was calculated at 72.12 and mean TAD was about 25.186. The TAD values were acceptable. The Harris hip score were cross tabulated with the above parameters and an inference was obtained.

**Table 9: Sex 1 yrs HHS crosstabulation**

		1 yrs HHS				Total
		Poor	Fair	Good	Excellent	
Sex	F Count% within Sex	1 3.8%	5 19.2%	12 46.2%	8 30.8%	26 100.0%
	M Count % Within Sex	2 28.6%	0 0.0%	5 71.4%	0 0.0%	7 100.0%
<b>Total</b>	<b>Count % within Sex</b>	<b>3 9.1%</b>	<b>5 15.2%</b>	<b>17 51.5%</b>	<b>8 24.2%</b>	<b>33 100.0%</b>

P value- 0.028

**Table 10: Age \*1 yrs HHS crosstabulation**

		1 yrs HHS				Total
		Poor	Fair	Good	Excellent	
Age	Below 70 Count% within Age	0 0.0%	2 16.7%	7 58.3%	3 25.0%	12 100.0%
	70-80 Count % Within Age	0 0.0%	3 18.8%	9 56.3%	4 25.0%	16 100.0%
	Above 80 Count % Within Age	3 60.0%	0 0.0%	1 20.0%	1 20.0%	5 100.0%
<b>Total</b>	<b>Count % within Age</b>	<b>3 9.1%</b>	<b>5 15.2%</b>	<b>17 51.5%</b>	<b>8 24.2%</b>	<b>33 100.0%</b>

P value 0.038

**Table 11: # Type 1 yrs HHS crosstabulation**

		1 yrs HHS				Total
		Poor	Fair	Good	Excellent	
# Type	Stable Count% within type	0	2	10	8	20

		0.0%	10.0%	50.0%	40.0%	100.0%
	Unstable Count % Within type	3	3	7	0	13
		23.1%	23.1%	53.8%	0.0%	100.0%
<b>Total</b>	<b>Count % within type</b>	<b>3</b>	<b>5</b>	<b>0</b>	<b>8</b>	<b>33</b>
		<b>9.1%</b>	<b>15.2%</b>	<b>0.0%</b>	<b>24.2%</b>	<b>100.0%</b>

P value 0.038

**Table 12:** Reduction \*1 yrs HHS cross tabulation

		1 yrs HHS				Total
		Poor	Fair	Good	Excellent	
Reduction	Adequate Count% within Reduction	2	3	8	3	16
		12.5%	18.3%	50.0%	18.8%	100.0%
	Good Count % Within Reduction	1	2	9	5	17
		5.9%	11.8%	52.9%	29.4%	100.0%
<b>Total</b>	<b>Count % within Reduction</b>	<b>3</b>	<b>5</b>	<b>17</b>	<b>8</b>	<b>33</b>
		<b>9.1%</b>	<b>15.2%</b>	<b>51.5%</b>	<b>24.2%</b>	<b>100.0%</b>

P value 0.871

**Table 13:** Tad \* 1 yrs HSS crosstabulation

		1 yrs HHS				Total
		Poor	Fair	Good	Excellent	
TAD	Accetable Count% within TAD	0	3	8	8	20
		0.0%	15.0%	45.0%	40.0%	100.0%
	Non Accetable Count % Within TAD	3	2	8	0	13
		23.1%	15.4%	61.5%	0.0%	100.0%
<b>Total</b>	<b>Count % within TAD</b>	<b>3</b>	<b>5</b>	<b>17</b>	<b>8</b>	<b>33</b>
		<b>9.1%</b>	<b>15.2%</b>	<b>51.5%</b>	<b>24.2%</b>	<b>100.0%</b>

P value 0.007

**Table 14:** Preinjury grade \*1 yrs HSS crosstabulation

		1 yrs HHS				Total
		Poor	Fair	Good	Excellent	
Preinjury grade	1	0	4	15	8	27
	Count% within Preinjury grade	0.0%	14.8%	55.6%	29.6%	100.0%
	2	3	1	2	0	6
	Count % Within Preinjury grade	50.0%	16.7%	33.3%	0.0%	100.0%
<b>Total</b>	<b>Count % within Preinjury grade</b>	<b>3</b>	<b>5</b>	<b>17</b>	<b>8</b>	<b>33</b>
		<b>9.1%</b>	<b>15.2%</b>	<b>51.5%</b>	<b>24.2%</b>	<b>100.0%</b>

P value 0.007

**Table 15:**

Fishers exact test p value	
P	
Age*1yrs HHS	0.038 Sig
Sex*1yrs HHS	0.028 Sig
Side*1yrs HHS	0.592
Moi*1yrs HHS	0.801
#Type*1yrs HHS	0.006 HS
Reduction*1yrs HHS	0.871
Tad*1yrs HHS	0.007 HS
Preinjury grade*1yrs HHS	0.007 HS
Postop pain*1yrs HHS	0.026 Sign

In analysing the above data, the age, sex, tip apex distance, fracture type, postoperative pain and pre injury grade had a significant contribution to the final outcome. The six and one year Harris hip score values were similar to pre-existing studies. However, further studies have to be undertaken keeping in mind the other comorbidities, and contributing factors.

## DISCUSSION

Advances in the treatment of chronic diseases and improvements in living standards have resulted in a considerable increase in the life expectancy of individuals. However, as the quality of bone decreases with age, the prevalence of hip fractures increases. The stability of fixation for intertrochanteric fractures depends

on many factors: the age of the patient; the patient's general health; the time from fracture to treatment; the adequacy of treatment; concurrent medical treatment; and the stability of fixation<sup>10</sup>. At present, we consider that the PFN is an acceptable and minimally invasive implant for unstable proximal femoral fractures<sup>8,9,18</sup>. Various studies concerning the functional outcomes of operative treatments of hip fractures have been performed. For an elderly patient with a femoral fracture, the ability to mobilize in their own home and in their community would determine their ability to live independently<sup>15,16</sup>. Institutionalised older people<sup>17</sup>, who are at a higher risk of hip fracture than community-dwelling individuals, have differences in some risk factors for hip fracture that should be considered in targeting intervention programs. The appropriate method and ideal implant to use are topics that are still open to debate, with proposals of various approaches each claiming advantages over the other methods<sup>12,13,14</sup>. Quality of life and function are usually measures that are important for patients and health care providers. The HHS was developed to evaluate outcomes following orthopedic surgery of the hip joint. In our study, the HHS was positively correlated with the patient age, fracture type, reduction and radiological parameters.

### CONCLUSION

PFN is a reliable fixation method with good fracture union. Our present study showed that several clinical factors could be used to predict the possible outcome, designated by Harris hip score. Independent risk factors for poor Harris hip score after surgery were the number of comorbidities, further studies are needed to confirm the prediction model in new prospective cases. Minimal trauma to the tissues during the surgical procedure, less operating time helps the elderly people recover fast. One year harris hip scores were acceptable. Though complications can occur, most of them are related to the associated morbidity than the fracture and surgery.

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