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Early functional outcome of proximal femoral nail vs dynamic hip screw in the management of intertrochanteric fractures

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Introduction: Intertochanteric fractures are the most frequently operated fracture type and has the highest postoperative fatality rate.
Aim of The Study: To assess the early functional outcome of proximal femoral nail v/s dynamic hip screw in the management of intertrochanteric fractures.
Materials and Methods: All patients admitted in all the Orthopaedic units of Sri Siddhartha Medical College Hospital and Research Centre, Tumkur with a clinical diagnosis of intertrochanteric fractures were included in this study after obtaining their informed and valid written consent. This study was undertaken from October 2015 to March 2017. Fifty cases of intertrochanteric fractures fulfilling the inclusion and exclusion criteria were divided into proximal femoral nail group and Dynamic hip screw group.
Results: Out of 50 patients with intertrochanteric fractures, 25 were treated with proximal femoral nail and 25 were treated with Dynamic hip screw. In Proximal femoral nail group, mean duration of surgery was 82.4+/-14.7 minutes and mean blood loss was 98.4+/-29.1 ml whereas in Dynamic hip screw group, mean duration of surgery was 95.4+/-11.6 minutes and mean blood loss was 204.4+/-61.4 ml. In PFN group, 60% had excellent and 40% had good overall functional outcome. In DHS group, 40% had excellent, 44% had good and 16% had fair overall functional outcome. There were 2 cases of infection and 1 case of implant related complication in the Dynamic hip screw group.
Conclusion: The study concluded that both Dynamic Hip Screw and Proximal Femoral Nail remained the implant of choice for the stable intertrochanteric fractures (31-A1). In the more unstable types of fracture (31-A2 and 31-A3), we observed that the Proximal femoral nail was the best choice of implant for fixation since it had better overall functional outcome, less operative time and less blood loss.

Keywords: Inter tochanteric fractures, dynamic hip screw, proximal femoral nail

Introduction

Intertrochanteric fractures are the most frequently operated fracture type and has the highest postoperative fatality rate [1].

The incidence of fractures in proximal femoral area has risen with increasing numbers of elderly persons with osteoporosis and traffic accidents in young adults [2].

The aim of surgery is to achieve early mobilization and prompt return to pre-fracture activity level. The treatment of this fracture remains a challenge to the surgeon [3].

Two broad categories of internal fixation devices are commonly used for intertrochanteric femoral fractures: sliding compression hip screws with side plate assemblies and intramedullary fixation devices [4].

The most widely used extramedullary implant- Dynamic Hip Screw (DHS)-seems to have a biomechanical disadvantage when compared with intramedullary devices because the load bearing in proximal femur is predominantly shared by the calcar. Intramedullary devices such as the Proximal femoral nail (PFN) are more stable under loading with shorter lever arm, so the distance between hip joint and the nail is reduced compared with that for a plate, thus diminishing the deforming forces across the implant [5].

In our hospital the intertrochanteric fractures are treated by Dynamic Hip Screw (DHS) fixation or proximal femoral nail (PFN) fixation after the preoperative evaluation.

This study was taken up to analyze the effectiveness of surgical treatment of intertrochanteric fracture of femur using Proximal Femoral Nail (PFN) and Dynamic Hip Screw (DHS) and to compare the clinical and functional outcomes of intertrochanteric fractures managed by proximal femoral nail (PFN) and dynamic hip screw (DHS).

Materials and Methods

All Patients admitted in all the Orthopaedic units of Sri Siddhartha Medical College Hospital and Research Centre, Tumkur with a clinical diagnosis of intertrochanteric fractures were included in this study after obtaining their informed and valid written consent. This study was undertaken from from October 2015 to March 2017. Clearance from institutional ethical committee was obtained before inititating the study.

Aim of the study

To assess the early functional outcome of proximal femoral nail v/s dynamic hip screw in the management of intertrochanteric fractures.

Objectives of the study

- To study the effectiveness of surgical treatment of intertrochanteric fracture using proximal femoral nail (PFN) and dynamic hip screw (DHS).
- Study and compare the clinical and functional outcomes of intertrochanteric fractures managed by proximal femoral nail (PFN) and dynamic hip screw (DHS).

Method of collection of data

Sample Size

50 cases of intertrochanteric fractures
Sample size for PFN: 25
Sample size for DHS: 25

Inclusion Criteria

- Fractures in the trochanteric area classified according to the Orthopedic Trauma Association Classification system AO/OTA 31-A1/A2/A3
- Patients with the age of 20 years and above
- All fresh fractures

Exclusion Criteria

- Patients younger than 20 years
- Patients not willing for surgery
- Non-ambulatory patients
- Patients medically unfit for surgery
- Bilateral IT fractures

Study Duration: October 2015 to March 2017 (18 months)

Study Design: Prospective study with a follow up till 6 months.

Methods

Pre-Operative Evaluation

All patients were evaluated pre-operatively by:

- History and clinical evaluation.
- Medical evaluation (Clinical evaluation, ECG, etc).
- Lab investigations (CBC, RBSL, RFTs, LFTs, etc).
- Radiographs (A.P view of the pelvis with both hips and lateral view of the fractured hip, Chest X-ray).

All patients were evaluated by a physician for fitness for surgery. If associated medical conditions were detected pre-operatively they were set right preoperatively.

Mobilization and Rehabilitation

Day 1: Ankle and calf exercises are started. Dvt stockings or crepe bandage is put.
Day 2: Knee Flexion with the patient sitting bedside at edge of bed after drain removal. Foleys catheter also is removed if it was put for monitoring intake output during and after the surgery.
Day 3: Skate Board exercises started on the bed, to strengthen the hip abductors.
Walking with the aid of a walker in relatively younger and cooperative patients but non-weight bearing started.
Patients were usually discharged after the suture removal on the 14th day and advised to do similar exercises at home. They were allowed to sit on a chair or stool at home.

Follow Up Protocol

Immediate follow up-0 month

Some important parameters which were assessed:
Clinical:

1. Shortening
2. Rotational deformities
3. Signs of infection

One month

Some important parameters which were assessed:
Clinical:

1. Wound condition/scar condition
2. Harris Hip score
3. Shortening.

Radiological

1. Appearance of Callus
2. Amount of collapse

Follow up instructions

Patients were asked to use a single crutch and bear successive weight on the affected limb.

Three Months

Some important parameters which were assessed:
Clinical:

1. Harris hip score
2. Implant Failure

Radiological

1. Union
2. Amount of collapse

Follow up instructions

Patients were asked to walk with a cane and to climb staircase using side railing.

Six Months

Some important parameters which were assessed:
Clinical:

1. Implant failure
2. Harris hip score

Radiological

1. Union
2. Amount of collapse

Follow up instructions
Patients were asked to walk with a cane only if required for imbalance and in elderly patients.

Observation and Results
Statistical analysis
Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions. Chi-square test was used as test of significance for qualitative data.
Continuous data was represented as mean and SD. Independent t test was used as test of significance to identify the mean difference between two quantitative variables. Paired t test is the test of significance for paired data such as Harris Hip Score 1st month vs 3rd month and 1st month vs 6th month for quantitative data.

Graphical representation of data: MS Excel and MS word was used to obtain various types of graphs such as bar diagram.
P value (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests.

Statistical software: MS Excel**,** SPSS version 22 **(**IBM SPSS Statistics, Somers NY, USA) was used to analyze data.

Table 1: Age distribution comparison between two groups

		Group					
		Proximal Femoral Nail		Dynamic Hip Screw		Total	
		Count	%	Count	%	Count	%
Age	60 to 65 Years	10	40.0%	12	48.0%	22	44.0%
	66 to 70 Years	9	36.0%	8	32.0%	17	34.0%
	>70 Years	6	24.0%	5	20.0%	11	22.0%
	Mean± SD	67.9±5		66.8±4.8		67.32±4.8	

X 2=0.332, DF=2, p=0.847

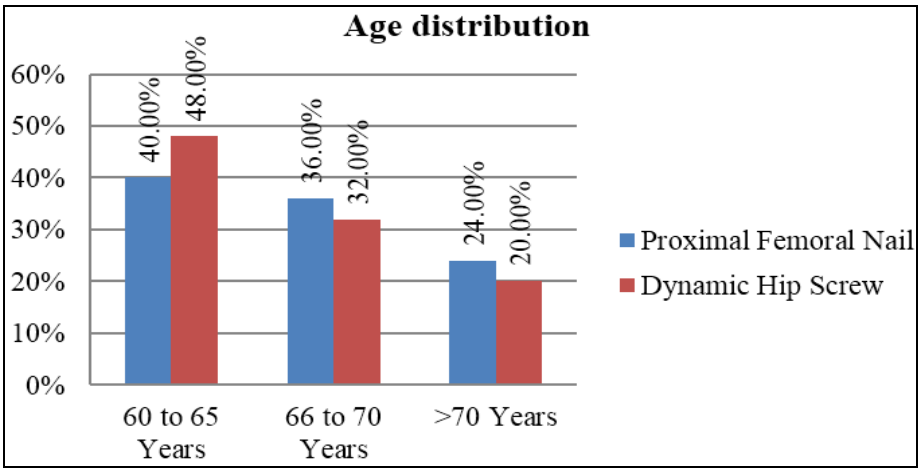


Fig 1: Bar diagram showing Age distribution comparison between two groups

Table 2: Sex distribution comparison between two groups

		Group					
		Proximal Femoral Nail		Dynamic Hip Screw		Total	
		Count	%	Count	%	Count	%
Sex	Female	16	64.0%	17	68.0%	33	66.0%
	Male	9	36.0%	8	32.0%	17	34.0%

X2=0.089, DF=1, p=0.765

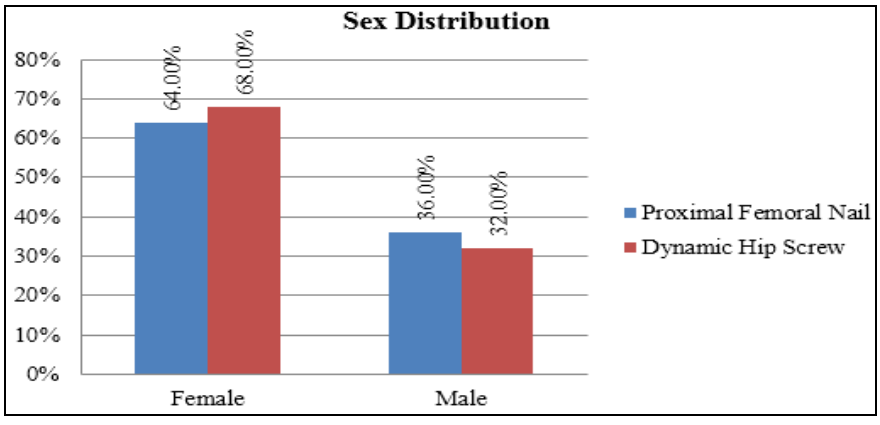


Fig 2: Bar diagram showing Sex distribution comparison between two groups

Table 3: Side of Injury distribution comparison between two groups

		Group					
		Proximal Femoral Nail		Dynamic Hip Screw		Total	
		Count	%	Count	%	Count	%
Side of Injury	Left	10	40.0%	9	36.0%	19	38.0%
	Right	15	60.0%	16	64.0%	31	62.0%

X2=0.085, DF=1, p=0.771

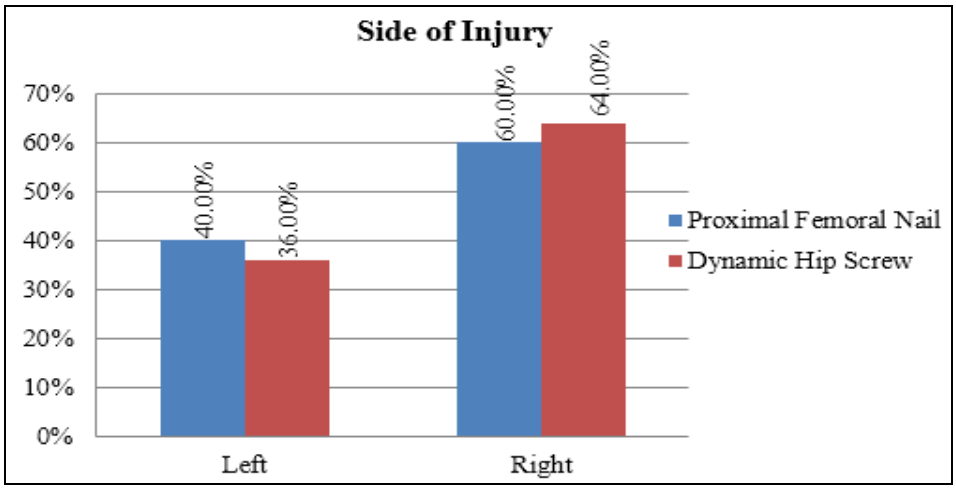


Fig 1: Bar diagram showing Side of Injury distribution comparison between two groups

Table 4: Fracture Type distribution comparison between two groups

		Group					
		Proximal Femoral Nail		Dynamic Hip Screw		Total	
		Count	%	Count	%	Count	%
Fracture Type	31-A1	14	56.0%	15	60.0%	29	58.0%
	31-A2	8	32.0%	8	32.0%	16	32.0%
	31-A3	3	12.0%	2	8.0%	5	10.0%

X2=0.234, DF=2, p=0.889

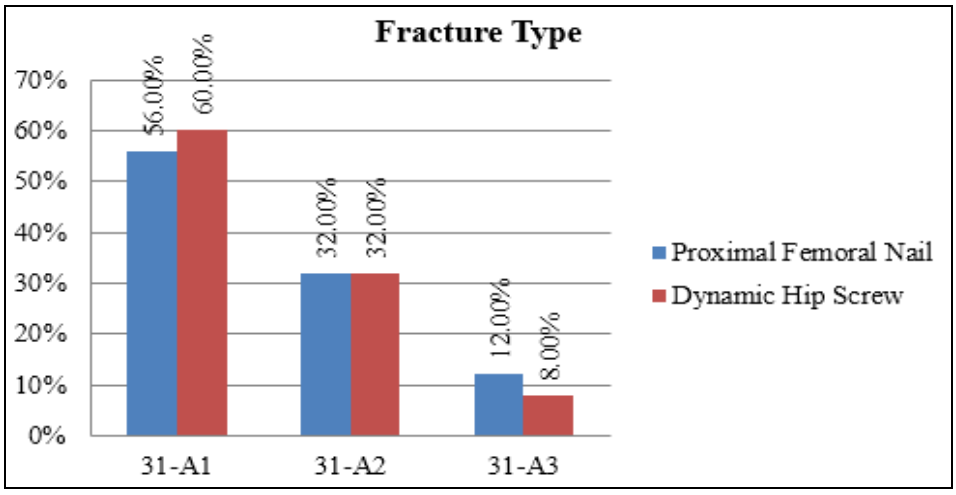


Fig 2: Bar diagram showing Fracture Type distribution comparison between two groups

Table 5: Duration of Surgery comparison between two groups

		Duration of Surgery in minutes		t test	p value
		Mean	SD		
Group	Proximal Femoral Nail	82.4	14.7	-3.474	0.001*
	Dynamic Hip Screw	95.4	11.6		
	Total	88.9	14.6		

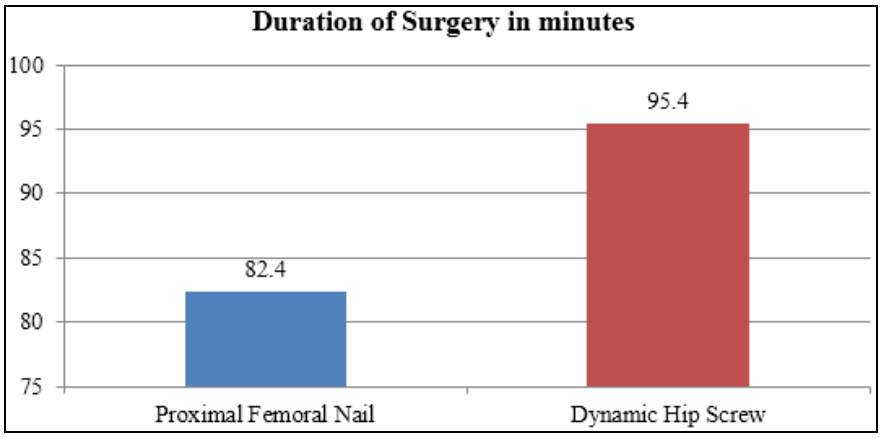


Fig 5: Bar diagram showing Duration of Surgery comparison between two groups

Table 6: Amount of Blood Loss comparison between two groups

		Blood Loss in ml		t test	p value
		Mean	SD		
Group	Proximal Femoral Nail	98.4	29.1	-7.802	<0.001*
	Dynamic Hip Screw	204.4	61.4		
	Total	151.4	71.6		

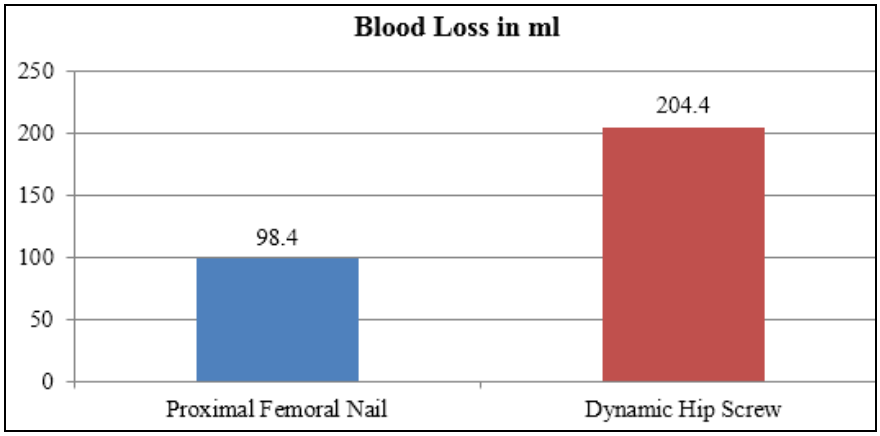


Fig 6: Bar diagram showing Amount of Blood Loss comparison between two groups

Table 7: Amount of Blood Loss comparison between two groups with respect to Fracture type

			Blood Loss in ml		t test	p value
			Mean	SD		
Fracture Type	31-A1	Proximal Femoral Nail	82.1	8.9	-14.746	<0.001*
		Dynamic Hip Screw	175.3	22.0		
	31-A2	Proximal Femoral Nail	102.5	10.4	-5.789	<0.001*
		Dynamic Hip Screw	228.8	60.8		
	31-A3	Proximal Femoral Nail	163.3	32.1	-2.658	0.007*
		Dynamic Hip Screw	325.0	106.1		

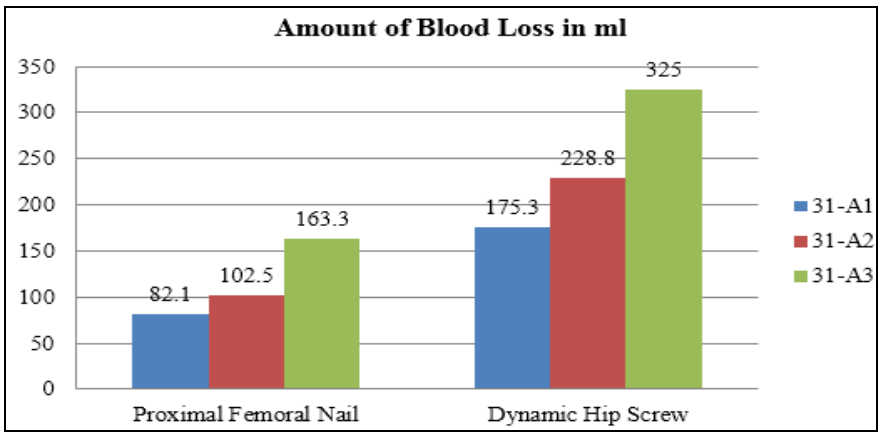


Fig 7: Bar diagram showing Amount of Blood Loss comparison between two groups with respect to Fracture type

Table 8: No. of blood unit's transfused comparison between two groups

		Group					
		Proximal Femoral Nail		Dynamic Hip Screw		Total	
		Count	%	Count	%	Count	%
No. of blood units transfused	0	21	84.0%	11	44.0%	32	64.0%
	1	3	12.0%	10	40.0%	13	26.0%
	2	1	4.0%	3	12.0%	4	8.0%
	3	0	0.0%	1	4.0%	1	2.0%

X2=8.894, DF=3, p=0.031*

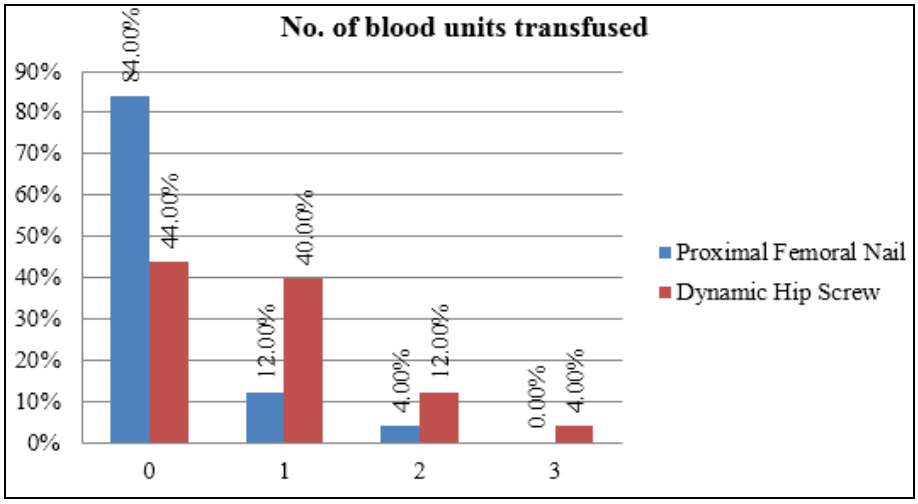


Fig 3: Bar diagram showing No. of blood units transfused comparison between two groups

Table 9: Time for complete union of fracture comparison between two groups

		Group					
		Proximal Femoral Nail		Dynamic Hip Screw		Total	
		Count	%	Count	%	Count	%
Time for complete union of fracture in months	3	10	40.0%	9	36.0%	19	38.0%
	6	15	60.0%	16	64.0%	31	62.0%

X2=0.085, DF=1, p=0.771

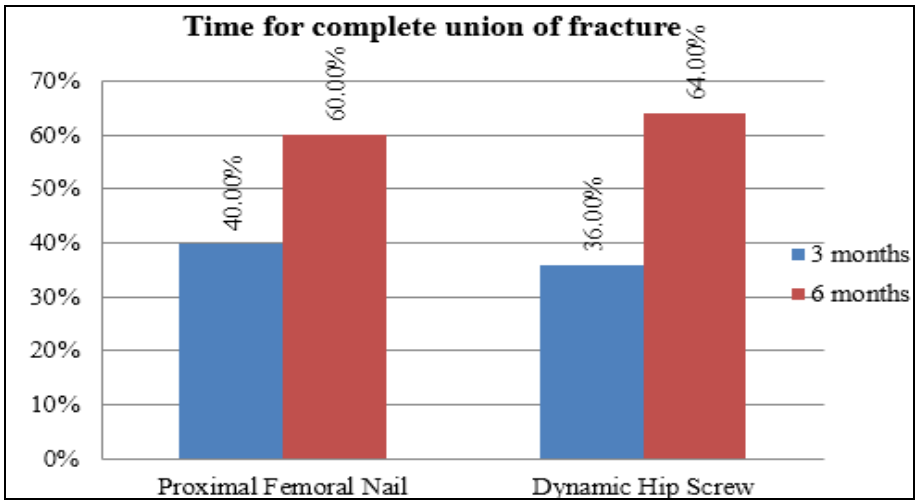


Fig 9: Bar diagram showing Time for complete union of fracture comparison between two groups

Table 10: Time for complete union of fracture comparison between two groups

		Time for complete union of fracture in months		t test	p value
		Mean	SD		
Group	Proximal Femoral Nail	4.8	1.5	-0.286	0.776
	Dynamic Hip Screw	4.9	1.5		
	Total	4.9	1.5		

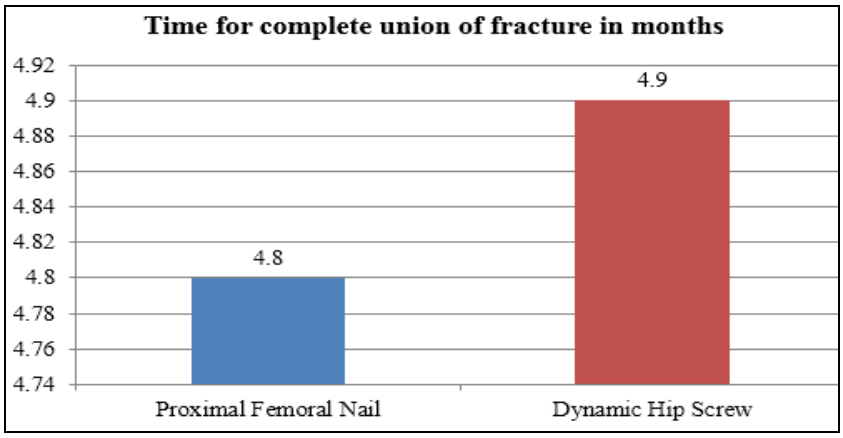


Fig 10: Bar diagram showing Time for complete union of fracture comparison between two groups

Table 11: Harris Hip Score comparison between two groups at 1st month, 3rd month and 6th month

Harris Hip Score	Group								t test	p value b/w 2 groups
	Proximal Femoral Nail			Dynamic Hip Screw			Total			
	Mean	SD	P value	Mean	SD	P value	Mean	SD		
1st month	46.9	8.1		36.4	5.6		41.7	8.7	5.314	<0.001*
3rd month	66.7	6.5	<0.001*	63.4	9.8	<0.001*	65.0	8.4	1.398	0.169
6th month	92.1	4.0	<0.001*	87.5	7.6	<0.001*	89.8	6.4	3.244	0.011*

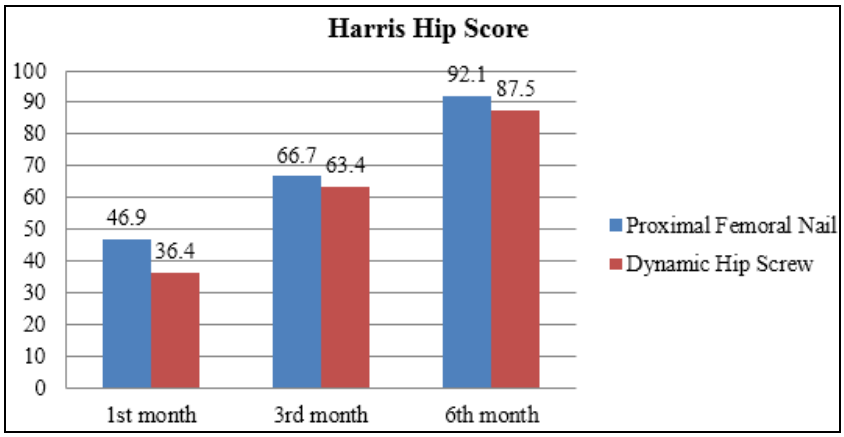


Fig 11: Bar diagram showing Harris Hip Score comparison between two groups at 1st month, 3rd month and 6th month

Table 12: Harris Hip Score comparison between two groups at 1st month, 3rd month and 6th month among those with A1 Fracture

Harris Hip Score	Group						t test	p value b/w 2 groups
	Proximal Femoral Nail		Dynamic Hip Screw		Total			
	Mean	SD	Mean	SD	Mean	SD		
1st month	51.1	6.2	37.8	4.6	44.2	8.6	6.588	<0.001*
3rd month	69.5	6.2	67.1	6.3	68.2	6.2	1.050	0.303
6th month	93.7	3.1	91.4	5.2	92.5	4.4	2.901	0.160

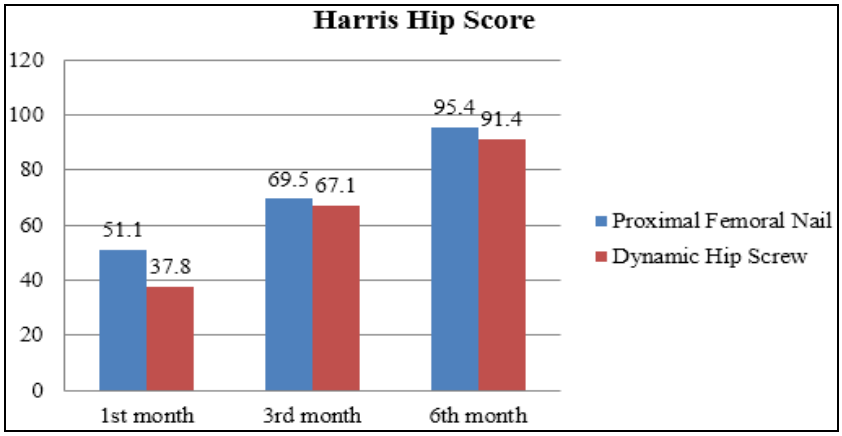


Fig 12: Bar diagram showing Harris Hip Score comparison between two groups at 1st month, 3rd month and 6th month among those with A1 Fracture

Table 13: Harris Hip Score comparison between two groups at 1st month, 3rd month and 6th month among those with A2 Fracture

Harris Hip Score	Group						t test	p value b/w 2 groups
	Proximal Femoral Nail		Dynamic Hip Screw		Total			
	Mean	SD	Mean	SD	Mean	SD		
1st month	43.0	7.7	37.0	3.9	40.0	6.7	1.969	0.069
3rd month	64.3	5.7	62.0	8.9	63.1	7.3	0.603	0.556
6th month	91.1	3.9	84.5	4.4	87.8	5.3	3.208	0.006*

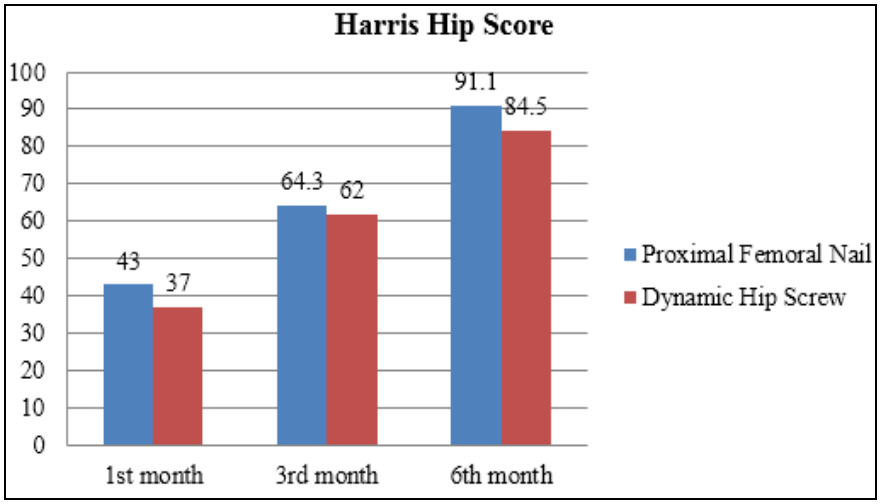


Fig 13: Bar diagram showing Harris Hip Score comparison between two groups at 1st month, 3rd month and 6th month among those with A2 Fracture

Table 14: Harris Hip Score comparison between two groups at 1st month, 3rd month and 6th month among those with A3 Fracture

Harris Hip Score	Group						t test	p value b/w 2 groups
	Proximal Femoral Nail		Dynamic Hip Screw		Total			
	Mean	SD	Mean	SD	Mean	SD		
1st month	37.7	4.6	24.0	0	32.2	8.2	3.970	0.029*
3rd month	60.0	0	41.5	2.1	52.6	10.2	16.547	<0.001*
6th month	87.0	3.5	70.5	0.7	80.4	9.4	6.325	0.008*

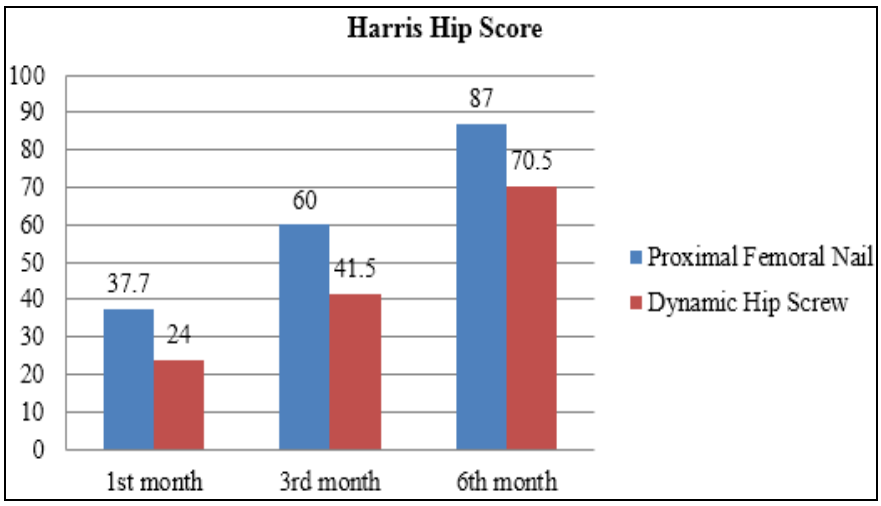


Fig 14: Bar diagram showing Harris Hip Score comparison between two groups at 1st month, 3rd month and 6th month among those with A3 Fracture

Table 15: Overall Functional Outcome comparison between two groups

		Group					
		Proximal Femoral Nail		Dynamic Hip Screw		Total	
		Count	%	Count	%	Count	%
Overall Functional Outcome	Excellent	15	60.0%	10	40.0%	25	50.0%
	Good	10	40.0%	11	44.0%	21	42.0%
	Fair	0	0.0%	4	16.0%	4	8.0%

X2=5.048, DF=2, p=0.080

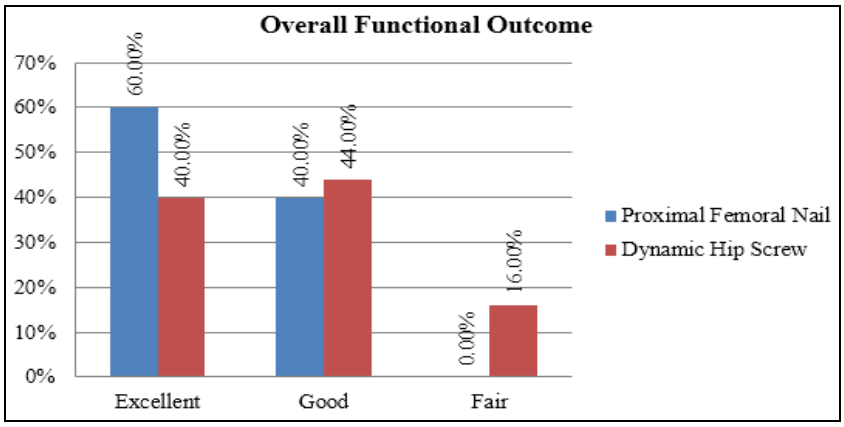


Fig 15: Bar diagram showing Overall Functional Outcome comparison between two groups

Table16: Complications comparison between two groups

Complications	Proximal Femoral Nail		Dynamic Hip Screw	
	Count	%	Count	%
Infection	0	0%	2	8%
Implant Related	0	0%	1	4%
Medical Complication	1	4%	1	4%
Deaths	0	0%	0	0%
Non-Union	0	0%	0	0%

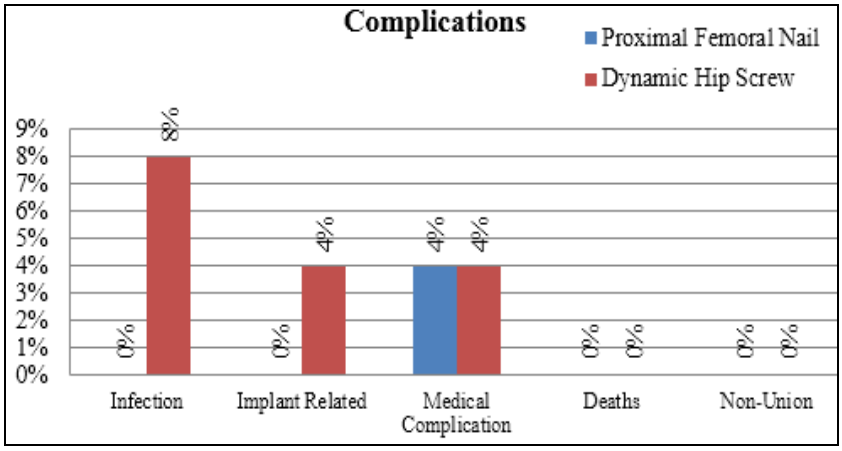


Fig 16: Bar diagram showing Complications comparison between two groups

Table 17: Association between Fracture type and Overall Functional outcome comparison between two groups

				Group						P value
				Proximal Femoral Nail		Dynamic Hip Screw		Total		
				Count	%	Count	%	Count	%	
Fracture Type	31-A1	Overall Functional Outcome	Excellent	10	71.4%	10	66.7%	20	69.0%	0.782
			Good	4	28.6%	5	33.3%	9	31.0%	
	31-A2	Overall Functional Outcome	Excellent	4	50.0%	0	0.0%	4	25.0%	0.041*
			Good	4	50.0%	6	75.0%	10	62.5%	
			Fair	0	0.0%	2	25.0%	2	12.5%	
	31-A3	Overall Functional Outcome	Excellent	1	33.3%	0	0.0%	1	20.0%	0.082
			Good	2	66.7%	0	0.0%	2	40.0%	
			Fair	0	0.0%	2	100.0%	2	40.0%	

Table 18: Summary in Proximal Femoral Nail and Dynamic Hip Screw

	Group				P value
	Proximal Femoral Nail		Dynamic Hip Screw		
	Mean	SD	Mean	SD	
Duration of Surgery in minutes	82.4	14.7	95.4	11.6	0.001*
Blood Loss in ml	98.4	29.1	204.4	61.4	<0.001*
Time for complete union of fracture in months	4.8	1.5	4.9	1.5	0.776
Harris Hip Score at 1st month	46.9	8.1	36.4	5.6	<0.001*
Harris Hip Score at 3 months	66.7	6.5	63.4	9.8	0.169
Harris Hip Score at 6 months	92.1	4.0	87.5	7.6	0.011*

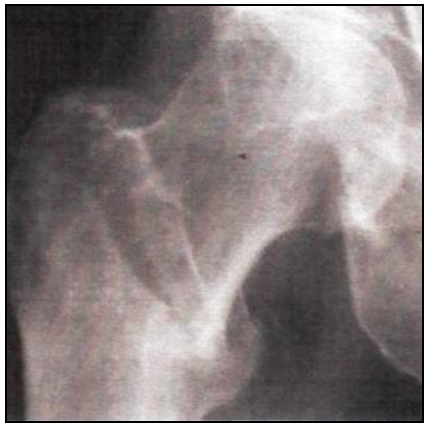
Case Photographs
Case I Dynamic Hip Screw and Plating

Flexion 90°

Abduction 20° **internal rotation 35°**

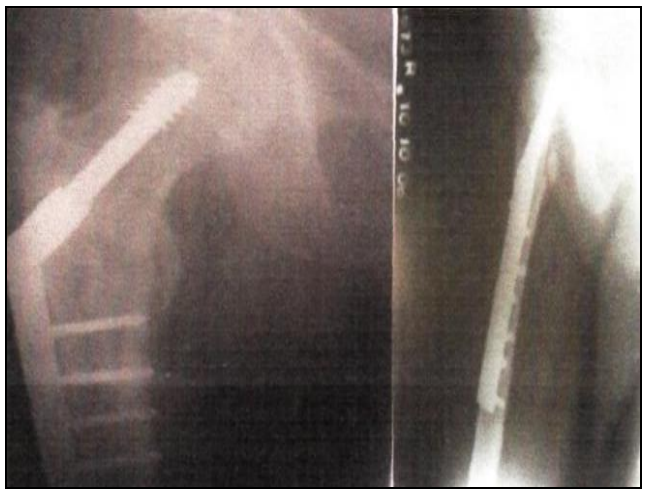
External Rotation 20° **Standing**

Pre-Op X-Ray 31-A1 Fracture



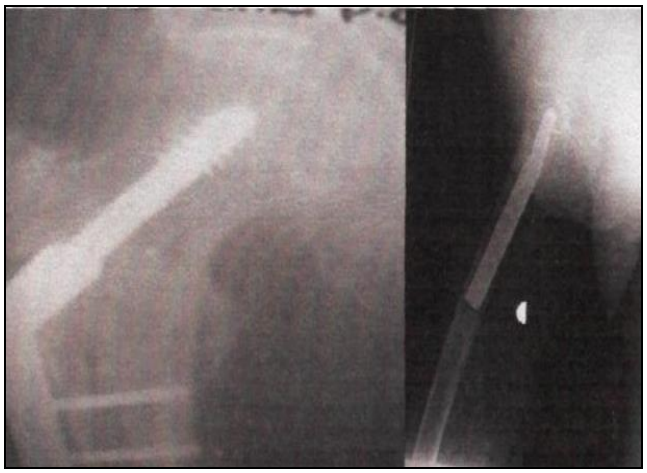
Simple, two part Intertrochanteric fracture

Post-Op X-ray Ap view and lateral view



Reduction: satisfactory. Cortical congruence restored
Displacement between fragments is more than 2mm
Position of screw: Is central in AP view. Central in Lateral view.

Follow up X-Ray at 24 weeks



Reduction: Cortical Congruence maintained. Displacement between fragments is more than 2mm.
Position of screw: Is Central in AP view. Central in Lateral View. Complete Union.

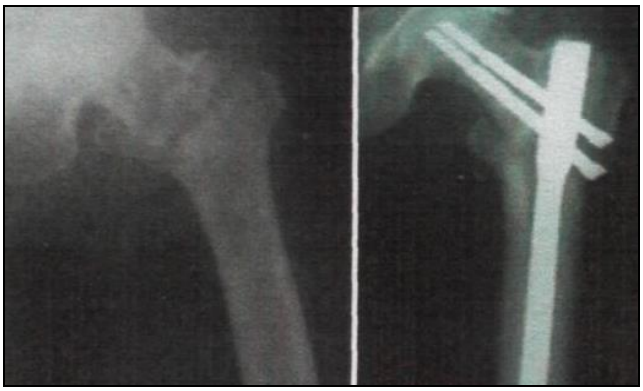
Case Iii Proximal Femoral Nailing

Flexion 120° **Abduction 35°**

Internal Rotation 20° **External Rotation 40°**

Standing

Pre-Op X-Ray 31-A2 Fracture
Intertrochanteric fracture having multiple fragments



Post Op X-Ray **Post Op X-Ray**

After 24 Weeks

Discussion

Our study was aimed at comparing the Proximal Femoral Nail with Dynamic Hip Screw with side plate assembly for Fixation of Intertrochanteric Fractures in patients fulfilling the inclusion criteria. The Total Duration of Operating time, amount of blood loss during the procedure, Complications in immediate post-operative period and wound related complications, implant failure and postoperative function of the limb was compared between both the groups.

In the present study, 50 patients with intertrochanteric fractures were selected and divided into two groups: PFN group and DHS group.

All the fractures were classified as per the A. O (Muller) classification into 31-A1, 31-A2 and 31-A3 fractures.

31-A1 fractures were stable fractures and 31-A2 and 31-A3 were unstable fractures.

Comparison of Age distribution with other studies

The mean age of the patients in the Dynamic hip Screw group was 64 years and in proximal femoral nail group was 58 years in the study done by Suman SK *et al*. [17].

In the study conducted by Myderrizi N (2016), average age of patients was 77.3 years [19].

In our study, mean age of subjects was 67.9±5 years in the Proximal Femoral Nail. Mean age of subjects was 66.8±4.8 years in Dynamic Hip Screw group.

Comparison of sex distribution with other studies

The study conducted by Myderrizi N had a total of 63 patients with intertrochanteric fractures, out of which 15 were males and 48 were females. The study had a sex distribution of 24% males and 76% females [19].

In other western studies as well [60, 61] females were more affected than males.

In our study, 50 patients with intertrochanteric fractures were included of which 17 were males and 33 females. This study consisted of 34% males and 66% females.

Side Distribution

In the study done by Suman S K *et al*, out of 50 patients, 26% had left side intertrochanteric fracture while 74% had right side intertrochanteric fracture[17].

In our study, out of 50 patients, 38% of the patients had injury on the left side and 62% on the right side.

Fracture Type Distribution

A study by Myderrizi done on a total of 63 patients showed 23.8% 31-A1 fractures, 58.7% had 31-A2 fractures and 17.5% had 31-A3 fractures [19].

In the study by Kumar R *et al*. on 50 patients, there were 24% patients with 31-A1 fractures, 58% with 31-A2 fractures and 18% with 31-A3 fractures [14].

In our study, the intertrochanteric fractures were classified under the AO/OTA classification into 31-A1, 31-A2, 31-A3. Out of 50 patients, 58% had 31-A1 fractures, 32% had 31-A2 fractures and 10% had 31-A3 fractures.

Duration of Surgery

In the study done by Myderrizi, mean duration of surgery for PFN was 49.3 min and for DHS was 72.3 min [19]

Study done by Kumar R *et al*, PFN group had a mean duration of surgery of 55 min ±18 min while the DHS group had a mean duration of surgery of 87 min ±3.2 min [14].

In our study, in the Proximal Femoral Nail group, mean Duration of Surgery was 82.4±14.7 minutes and in Dynamic

Hip Screw, mean Duration of Surgery was 95.4±11.6 minutes. This difference in mean duration of surgery between two groups was statistically significant. This suggests that duration of surgery was significantly lower for Proximal Femoral Nail than Dynamic Hip Screw.

Blood Loss

In the study by Myderrizi N, average amount of blood loss intraoperatory was 85.4±25.7ml in PFN group and 122.2±37.2ml in DHS group [19].

In the study by Kumar R *et al*, the average blood loss was 100 ml in the PFN group and 250 ml in the DHS group [14].

In our study, The P.F.N group had a distinct reduction in the operative blood loss with a mean blood loss of 98.4±29.1 ml and in Dynamic Hip Screw, mean blood loss was 204.4±61.4 ml Thus, more blood loss was seen which was statistically significant with the use of Dynamic Hip Screw.

Union

In Proximal Femoral Nail group, time for complete union of fracture was 3 months in 40% and 6 months in 60% and in Dynamic Hip Screw group, time for complete union of fracture was 3 months in 36% and 6 months in 64%. There was no significant difference in time for complete union of fracture between two groups.

Mortality and Morbidity

Both the groups had equal number of medical complication in the post-operative period.

In the P. F. N group one patient developed acute kidney injury. In the D. H. S group one patient developed DVT with Pulmonary edema. These complications are explained by the fact that these are elderly patients. And had a major episode of a fracture hip which required surgical interference in addition to their previous ailments. Similar findings were observed by Bridle [62].

In our study, there were no deaths in both the groups similar to studies done by Suman SK *et al*. [17]

Study by Kumar R *et al*. showed one death each in both the PFN and DHS group. Both the deaths occurred three months after the surgery and in both cases the cause of death was not related to the surgery [14].

Implant Related Complications

In our study, in the P. F. N group there was no case of implant related complication and in the Dynamic hip Screw group, one case of implant related complication was noted. The cancellous screw cut out was seen at the femoral neck superiorly. This was probably due to poor bone quality, improper screw position, and failure to maintain the Tip Apex Distance (T.A.D). However this patient was relatively mobile and hence re-operation was not necessary. Our results were similar to the study by Suman SK *et al*. [17] and Shivanna UM *et al*. [25].

Post-Operative Infection

In the study done Suman SK *et al*, 3 patients of the DHS group were reported to have wound infections as compared to single patient in the PFN group [17].

Similar findings were also reported in the study by Shivanna UM where wound infection was seen in 4 patients in the DHS group and in 1 patient in the PFN group [25].

In our group, there were two cases of post-operative infection noted in the dynamic hip screw group. All infections occurred in the post-operative period within first 30 days. In both cases, a wound lavage with closure with an antibiotic cover was given according to culture and sensitivity. In all cases union occurred and did not require implant removal.

There were no cases of infection in the P. F. N group may be because of a smaller incision and shorter operating period and less bone exposure.

Post-Operative Function

In the study done by Kumar R *et al*. [14], the one month Harris Hip score in the DHS group (Avg 24.4) was less than that of the PFN group (Avg 33), $p<0.05$. However, this difference disappeared with the two groups on the third and sixth month follow up.

The study by Myderrizi N concluded that Harris Hip score seemed to be statistically better for PFN than DHS in 1st and 3rd month, respectively 36.5±4.7 and 61±4.95 for PFN in comparison with 29±3.9 and 41.7±7.1for DHS. At 6 months, they were more or less similar [19].

In our study, at 1st month in Proximal Femoral Nail group, mean Harris Hip Score was 46.9±8.1 and in Dynamic Hip Screw group was 36.4±5.6. This difference in mean Harris Hip Score at 1st month b/w two groups was statistically significant. Proximal Femoral Nail had higher Harris hip score than in Dynamic Hip Screw group. This may be explained by the early mobilization time in the PFN group compared to the DHS group

At 3rd month in Proximal Femoral Nail group, mean Harris Hip Score was 66.7±6.5 and in Dynamic Hip Screw group was 63.4±9.8. This difference in mean Harris Hip Score at 3rd month b/w two groups was not statistically significant. Proximal Femoral Nail had higher Harris hip score than in Dynamic Hip Screw group.

At 6th month in Proximal Femoral Nail group, mean Harris Hip Score was 92.1±4.0 and in Dynamic Hip Screw group was 87.5±7.6. This difference in mean Harris Hip Score at 6th month b/w two groups was statistically significant. Proximal Femoral Nail had higher Harris hip score than in Dynamic Hip Screw group.

Overall Functional Outcome

In our study, the stable (31- A1) fractures treated by DHS or PFN had similar overall functional outcome whereas the unstable (31-A2 and 31-A3) fractures had better overall functional outcome when treated with PFN

This was similarly seen in international study done by Myderrizi N [19] and study done by Faisal M and Nistane P [21].

Summary

In this prospective comparative study, 50 patients who sustained intertrochanteric Femur fractures were divided into two treatment groups. 25 were treated with PFN and 25 patients were treated with DHS and were followed up until 6 months post operatively.

The Harris Hip scores were initially better in the P.F.N group than that of the Dynamic Hip Screw in the initial post-op period upto one month. However, by the end of 6 months, both groups matched with each other in mobility scores.

To summarize, the findings at the end of the study comparing the P. F. N with DHS are:

1. The intraoperative blood loss and the post-operative blood transfusion requirement are significantly higher with the use of Dynamic hip screw.
2. The total operative time of surgery is more with the Dynamic Hip screw procedure.

3. The post-operative outcomes in terms of union, mortality and morbidity are similar in both the groups by the end of six months.
4. Harris Hip score for PFN group at 1st month was better than that of the DHS group.
5. In stable intertrochanteric fractures 31-A1 both PFN and DHS had equal number of excellent Harris Hip score at the end of 6 months
6. In Unstable Intertrochanteric fractures, 31-A2 and 31-A3, PFN had more number of excellent Harris hip score at 6 months compared to the DHS group.
7. There were 2 cases of infection in the DHS group, the cause of which can be attributed to wider operative wound site compared to PFN.

Screw cut out is the most common mechanism of failure in the Dynamic Hip screw. The cause of cutout is mainly failure to achieve the Tip Apex Distance and improper positioning of the Screw.

Conclusion

Intertrochanteric fractures are most commonly seen in the elderly population more so in patients with osteoporotic bones. The study concluded as follows:

Both Dynamic Hip Screw and Proximal Femoral Nail remained the implant of choice for the stable intertrochanteric fractures (31-A1). In the more unstable types of fracture (31-A2 and 31- A3), the P. F. N has distinct advantages over DHS and should be the preferred implant for fixation since it had better overall functional outcome, less operative time and less blood loss.

The mobilization time (i. e weight bearing time) was significantly less in PFN compared to DHS.

P.F.N should be preferred in cases of severe osteoporosis as it has got inherent stability and being intramedullary there is no question of screw cutout which is a very common complication in osteoporotic fractures treated with D. H. S.

By observing our outcomes we prefer P.F.N as the best choice implant for Intertrochanteric fractures especially in unstable type as it is superior in terms of stability, blood loss, duration of surgery, post-operative functional recovery and early union rates.

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Declarations

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