COMPARATIVE STUDY OF MANAGEMENT OF INTERTROCHANTERIC FRACTURES (TYPE 3 AND 4 BOYD AND GRIFFIN CLASSIFICATION) BY DYNAMIC HIP SCREW OR PROXIMAL FEMORAL NAIL

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ABSTRACT

BACKGROUND

Intertrochanteric fractures are one the common fractures encountered in today's orthopaedic practice. Intertrochanteric fractures are devastating injuries that most commonly affect the elderly population, but not increased in the younger population. In young and healthy individuals, the injury results from high energy trauma, whereas in the elder age group, most of the fractures are osteoporotic resulting from a trivial fall.

MATERIALS AND METHODS

This study was conducted in Konaseema Institute of Medical Sciences, Amalapuram, from July 2013 to September 2016. During this period, adult patients with pertrochanteric fractures of femur were classified according to Boyd and Griffin classification and 40 patients were selected according to inclusion criteria. This study was conducted with due emphasis for clinical observation and analysis of results after surgical management of these fractures of femur with dynamic hip screw or proximal femoral nailing.

RESULTS

Anatomical results were assessed by presence or absence of shortening, range of movements and deformities. 70% of the cases had good results in PFN series as compared to 65% in DHS series. Functional results were assessed in the 40 cases. These constituted of 20 cases in PFN series and 20 cases in DHS series. In PFN series, results were excellent results in 7 cases, good in 6 cases, fair in 2 cases and poor in 5 cases. In DHS series, results were excellent in 5 cases, good in 9 cases, fair in 2 cases and poor in 4 cases.

CONCLUSION

An intertrochanteric fracture of the femur is common in the elderly due to osteoporosis and in young due to high velocity trauma. As the fracture is more common in the elderly, early reduction and internal fixation increases patient comfort, facilitates nursing care, helps in early mobilisation of the patient and decreases the duration of hospitalisation. Anatomical reduction can be achieved by closed manipulation or open methods. As the incidence of comminution is high, these fractures may require a stable reduction and internal fixation. Bone grafting is required if there is a deficiency. Osteosynthesis with PFN offers the advantages of high rotational stability of the head-neck fragment, an unreamed implantation technique and the possibility of static or dynamic distal locking. Proximal femoral nail has the advantage of collapse at fracture site and is biomechanically sound.

KEYWORDS

Intertrochanteric Fractures, Type 3 and 4 Boyd and Griffin Classification.

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BACKGROUND

Intertrochanteric fractures are one of the common fractures encountered in today's orthopaedic practice. Intertrochanteric fractures are devastating injuries that most commonly affect the elderly population, but not increased in the younger population. In young and healthy individuals, the injury results from high energy trauma, whereas in the elder age group, most of the fractures are osteoporotic resulting from a trivial fall.[1]

Intertrochanteric fractures are common in the elderly females due to osteoporosis and 90% of fracture results from a simple fall.[1] These fractures can be managed by conservative methods, but malunion and complications of prolonged immobilisation is the end result. Thus, surgery by

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internal fixation is the ideal choice. DHS is the gold standard treatment for intertrochanteric fractures.[2]

In case of unstable intertrochanteric fractures, the incidence of limb shortening, medialisation of distal fragment and implant cut-outs is high.[1] This led to the development of intramedullary device. These devices have the advantages of being an intramedullary fixation device, shorter lever arm of device causing less tensile strain on the implant, controlled fracture impaction due to incorporation of sliding hip screw, shorter operative duration, less soft tissue dissection and early mobilisation.

Intertrochanteric fractures are femoral fractures where the fractures occur from intertrochanteric line to just below the lesser trochanter. Out of these, grade 3 and 4 are generally unstable with subtrochanteric extension. These fractures are noted for their higher incidence of unsatisfactory results after operative treatment. These fractures occur typically at the junction between trabecular bone and cortical bone where the mechanical stress across the junction is highest in the femur, which is responsible for their frequent comminution.

The choice of treatment for these fractures was open reduction and internal fixation. Many internal fixation devices have been recommended, but because of high incidence of complications like nonunion and implant failure, a series of evolution in designing a perfect implant has begun. Only recently, better understanding of biology, reduction techniques and biomechanically-improved implants like gamma nail, Russell-Taylor nail and proximal femoral nail have allowed these fractures to be addressed with consistent success.

MATERIALS AND METHODS

Clinical Materials

This study was conducted in Konaseema Institute of Medical Sciences, Amalapuram, from July 2013 to September 2016. During this period, adult patients with pertrochanteric fractures of femur were classified according to Boyd and Griffin classification and 40 patients were selected according to inclusion criteria.

This study was conducted with due emphasis for clinical observation and analysis of results after surgical management of these fractures of femur with dynamic hip screw or proximal femoral nailing.

Data Collection

Patients with grade 3 and 4 (Boyd and Griffin classification) intertrochanteric fracture admitted for the study were recorded in a proforma prepared for the study. Following the treatment, patients were discharged and followed up at outpatient department at regular intervals for clinical and radiological evaluation. Patients were followed up till fracture union and functional recovery. If necessary, subsequent follow up was done.

Management of Patients

At the arrival of the patient with these fractures, patients were resuscitated depending on their general condition. Fracture was stabilised using Thomas splint, alternatively with skin traction. A thorough preoperative assessment of the patients was done, which included the following-

1. General condition of the patient.
2. Clinical and radiological assessment of the fracture, type and size of fragments.

Clinical Examination

1. Inspection.
2. Palpation.
3. Measurements.
4. Movements.
5. Associated injuries.

Investigations

- Routine blood examination for haemoglobin %, total and differential count, ESR and blood grouping.
- Routine urine examination for proteins, sugar and microscopic examination.
- Blood urea, serum creatinine and random blood sugar.
- HIV-I and II, HbsAg and ECG according to the risk factors.
- Echocardiography as and when needed.

X-Rays

- Pelvis with both hips- AP view.
- Hip with femur full length of involved side- AP lateral views.
- Chest- PA view.

All the patients were shifted to ward with skin traction and put on a 3 kg weight varying on the built. Analgesics and antibiotics were given accordingly. Patients were evaluated for associated medical problems and reference was taken from respective departments and necessary treatment started. Associated injuries were evaluated and treated simultaneously. All patients were operated on an elective basis.

Inclusion Criteria

Age - 18 to 70 years.
Sex - Both sexes.
Grade 3 and 4 (Boyd and Griffin Classification) intertrochanteric fractures.
No comorbid illness.

Exclusion Criteria

Age - Less than 18 or greater than 70 yrs.
Grade 1 and 2 (Boyd and Griffin Classification) intertrochanteric fractures.
Previous surgery of proximal femur.
Segmental fractures.
Individuals who are unable to give consent.

Preoperative Planning

1. Determination of nail diameter by measuring the diameter of femur at the level of isthmus on AP view.

2. Length of hip screws and distal locking bolts on the AP view.
3. Neck shaft angle.
4. In cases where DHS was planned, neck shaft angle, size of Richard screw and plate length and screw sizes were determined on AP and lateral view.

OBSERVATION

Our study consisted of 40 cases of grade 3 and 4 (Boyd and Griffin) intertrochanteric fractures of femur treated surgically either by proximal femoral nail or dynamic hip screw in the Department of Orthopaedics, SVS Medical College and Hospital from July 2012 to September 2014. All patients were available for followup.

Age Distribution

In our series, maximum age was 69 years and minimum of 36 years with an average age of 58.36 years.

Age Group	Number of Cases	Percentage
21-40 yrs.	4	10
41-60 yrs.	17	42.5
61-70 yrs.	19	47.5

Table 1. Age Distribution

Side Affected

Right side were affected in 23 cases and left in 17 cases.

Side	Number of Cases
Right	23
Left	17

Table 2. Side Affected

Sex Distribution

Number of male patients in out series were 21 and females were 19.

Sex	Number of Cases
Male	21
Female	19

Table 3. Sex Distribution

Symmetric Measures

	Value	Approx. Sig.
Nominal by nominal contingency coefficient	0.159	0.256
No. of valid cases	40	

Table 4. Statistical Significance of Sex Distribution

Mode of Injury

The most common mode of injury in our series was fall on side of hip in 30 cases, Road Traffic Accidents (RTA) accounting for 9 cases and followed by fall from height in 1 case.

Mode of Injury	Number of Cases	Percentage
Fall on side	29	72.5
RTA	5	12.5
Fall from height	6	15

Table 5. Mode of Injury

Fracture Pattern

The 40 cases in our series were classified according to Boyd and Griffin classification.

Boyd and Griffin	Number of Cases	Percentage
Grade 3	25	62.5
Grade 4	15	37.5

Table 6. Boyd and Griffin Classification

Type of Surgery- Out of the 40 patients, 20 of them underwent fixation with proximal femoral nailing and rest of them were treated with DHS irrespective of their fracture pattern.

Timing of Surgery- All patients were treated on elective basis. Surgery was performed on average of 3 days with a range of 1 to 11 days. The delay was due to the availability of the operation theatre, general and medical conditions of the patients and managing associated injuries.

Intraoperative Details- All the patients' intraoperative details were noted in the terms of the duration of surgery, ease of reduction, complications, radiation exposure and the amount of blood loss. Duration was longer in managing intertrochanteric fractures type IV due to the difficulty in achieving anatomical reduction. Difficulty was noted in comminuted fractures and in cases with longer delay for surgery. Average time taken for DHS procedure was 130 mins. was compared to PFN, which was 115 mins.

Radiation exposure was higher in type IV fractures due to comminution and difficulty in reduction. The average duration of radiation exposure was 61 seconds for nailing and 98 seconds for DHS. Blood loss was measured in terms of mop count and suction drain collection. The average amount of blood loss was 210 mL for PFN procedure and 460 mL for DHS procedure.

In PFN series, posteromedial cortical defect was seen in 4 cases for which iliac cancellous bone grafting was done, whereas bone grafting was required in 8 cases of DHS series.

Criteria		DHS (Average)	Nailing (Average)
Duration of surgery		120 mins.	100 mins.
Blood loss (including suction drain)		430 mL	180 mL
Reduction	Easy	12	11
	Difficult	8	9
Radiation exposure		110 secs.	65 secs.

Table 7. Intraoperative Details

Intraoperative Complications

Proximal Femoral Nailing- We encountered certain complications in our study intraoperatively. They were commonly seen in comminuted fractures.

The complications are as follows-

- Jamming of the nail in the proximal fragment while insertion was noted in one case requiring progressive reaming of the proximal fragment and the use of a lesser diameter nail.

- In 8 cases, we had to do 'free-hand technique' for distal screw locking due to mismatch of the zig and nail occurring intraoperatively.
- In one case, fixation of the fracture occurred in varus angulation.
- In one case, iatrogenic fracture of the lateral cortex of the proximal fragment was noted, which was minimally displaced. No intervention was done for that fracture. Weightbearing was delayed postoperatively.
- In six of our cases, we had to perform open reduction due to wide displacement of the fragments.
- In one case, delay in surgery of 11 days was noted as the patient was not fit to be taken up for surgery. We had difficulty in reduction of the fracture in this patient, so the fracture site had to be opened up for reduction.

	No. of Cases	%
Jamming of nail	1	5%
Varus angulation	1	5%
Fracture of lateral cortex	1	5%
Femoral neck fracture	0	0%
Free-hand technique for distal locking	8	40%
Open reduction of fracture	6	30%

Table 8. Intraoperative Complications (PFN)

Intraoperative Complications

Dynamic HIP Screw

We encountered certain complications in our study intraoperatively. They were commonly seen in comminuted fractures, where reduction was difficult. Fracture reduction using DHS was easier as compared to proximal femoral nailing as the fracture site was exposed and reduced with clamps.

	No. of Cases	Percentage
Non-anatomical reduction (bone grafting)	10	50%
Varus angulation	1	5%

Table 9. Intraoperative Complications (DHS)

	Value	Approx. Sig.
Nominal by nominal contingency coefficient	0.564	0.003
No. of valid cases	40	

Table 10. Statistics for Intraoperative Complications

Postoperative Complications- In our DHS series, we had a case of wound infection at the operative site, which required intravenous antibiotics for a period of 3 weeks. Wound healed without the need for any further interventions. No other complications like deep venous thrombosis, systemic infection, etc. were noted. No immediate postoperative complications were seen in PFN series.

Delayed Complications

Proximal Femoral Nailing- In our PFN series, we had one case of malunion in varus angulation and 4 cases of delayed union. Two cases of delayed union required dynamisation, which were followed up till bony union, 2 other cases required bone grafting at the fracture site.

Three cases with shortening of 1 cm each were noticed due to the excessive comminution noted at the fracture site.

	Number of Cases	Percentage
Delayed union	4	20%
Shortening	3	15%
Implant failure	0	0
Varus angulation	1	5%
Z effect	0	0

Table 11. Delayed Complications- Proximal Femoral Nailing

Delayed Complications- Dynamic Hip Screw

Three cases had delayed union, which were treated by bone grafting. Three cases had implant failure, 2 of which were treated by implant removal and repeat DHS application with bone grafting. Other case was treated by implant removal and nailing with gamma nail. The fracture subsequently united after 14 weeks of nailing.

There were no cases of nonunion seen in our series.

	Number of Cases	Percentage
Nonunion	0	0
Delayed union	3	15%
Implant failure	3	15%

Table 12. Delayed Complications - Dynamic Hip Screw

Duration from the Day of Surgery to Mobilisation

Patients were mobilised out of the bed as soon as possible. They were made to do non-weightbearing, walking with the help of crutches/walker, Q-exercises and hip and knee mobilisation exercises. The average time taken for mobilisation from the time of surgery for PFN series was 3 days and for DHS series was 4 days.

	PFN Series	DHS Series
Duration from day of surgery to mobilisation	3 days	4 days

Table 13. Duration from the Day of Surgery to Mobilisation

Postop Mobilisation

The average duration of non-weightbearing walking in PFN series was from 3rd POD to 3 weeks as compared to 4th POD to 6 weeks in DHS series. Average duration of partial weightbearing walking in PFN series was from 3 weeks to 10 weeks as compared to 6 weeks to 12 weeks in DHS series. Average duration of FWB walking was >10 weeks for PFN series and >12 weeks for DHS series.

Two patients used crutches up to 15 weeks in PFN series and four patients used crutches up to 16 weeks in DHS series.

Full Weightbearing	PFN	DHS
10-15 weeks	15	12
16-20 weeks	4	5
20 + weeks	1	3
Table 14. Cross-Tabulation for Duration of Full Weightbearing Walking Post-Surgery		

Group	N	Mean	Std. Deviation	Std. Error Mean
NWB Walk				
PFN	20	20.24	0.82	0.16
DHS	20	43.91	21.44	4.47
NWB Walk				
PFN	20	74.48	28.43	5.69
DHS	20	60.87	28.59	5.96
Table 15. Group Statistics for Non-Weightbearing and Partial Weightbearing Walking Post Surgery				

Condition at Discharge

Patients were discharged with non-weightbearing using walker or crutches depending on the pain tolerability and fracture fixation.

Duration of Hospitalisation

The average duration of hospital stay following surgery was 12 days ranging from 8-16 days in the PFN series and 15 days ranging from 8-22 days in the DHS series.

	PFN Series	DHS Series
Duration of hospital stay	12 days	15 days
Table 16. Duration of Hospitalisation		

Mortality- There was no mortality in this study.

Follow up- The average duration of follow up was 15 months ranging from 5-26 months. Two patients were lost to follow up, one in DHS series and other in PFN series. Both the patients were lost during the 2nd month of follow up. Both the patients were not included in the study.

Radiological Union- Radiological union was said to be achieved on the evidence of obliteration of the fracture lines and trabecular continuity between the two fragments on anteroposterior and lateral x-rays. In PFN series, out of the 20 cases, 8 cases showed union at 12 weeks, 4 cases showed union at 14 weeks duration and 4 cases showed union at 18 weeks duration.

Four cases of delayed union were seen. Two cases of delayed union required dynamisation, which were followed up till bony union, which took 7 months and 8 months, respectively. Two other cases required bone grafting at the fracture site, which united at 6 months and 7 months, respectively.

In DHS series, out of the 20 cases, 6 cases showed union at 12 weeks' duration, 5 cases showed union at 14 weeks' duration, 3 cases showed union at 18 weeks' duration. Three cases of delayed union were seen for which bone grafting at the fracture site was done at 8 weeks, 10 weeks and 12 weeks. Fracture subsequently united after 10 weeks, 10 weeks and 14 weeks, respectively from the time of bone grafting. Three cases of breakage of implant in site were noticed at 12 weeks, 20 weeks and 25 weeks. Two of which were treated by implant removal and repeat DHS application with bone grafting. They united after 14 weeks and 16 weeks, respectively. Other case was treated by implant removal and nailing with gamma nail and bone grafting, which united after 20 weeks from the second surgery.

RESULTS

Anatomical Results- Anatomical results were assessed by presence or absence of shortening, range of movements and deformities. 70% of the cases had good results in PFN series as compared to 65% in DHS series.

PFN Series

	Number of Cases	Percentage
Good	14	70%
Poor	6	30%
Table 17 (a). Anatomical Results		

DHS Series

	Number of Cases	Percentage
Good	13	65%
Poor	7	35%
Table 17 (b). Anatomical Results		

			PFN	DHS	Total
ANATRES Group	G	Count	14	13	27
	P	% within	70%	65%	67.5%
Group	G	Count	6	7	13
	P	% within	30%	35%	32.5%
Total		**Count**	**20**	**20**	**40**
		% within	**100%**	**100%**	**100%**
Table 18 (a). Cross Table and p Value for Anatomical Results					

	Value	Approx. Sig.
Nominal by nominal contingency coefficient	0.115	0.424
No. of valid cases	40	
Table 18 (b). Symmetric Measures		

Functional Results

Functional results were assessed in the 40 cases. These constituted of 20 cases in PFN series and 20 cases in DHS series. In PFN series, results were excellent results in 7 cases, good in 6 cases, fair in 2 cases and poor in 5 cases. In DHS series, results were excellent in 5 cases, good in 9 cases, fair in 2 cases and poor in 4 cases.

PFN Series

	Number of Cases	Percentage
Excellent	8	40%
Good	6	30%
Fair	3	15%
Poor	3	15%
Table 19 (a) Functional Results		

DHS Series

	Number of Cases	Percentage
Excellent	5	25%
Good	9	45%
Fair	2	10%
Poor	4	20%

Table 19 (b) Functional results

		PFN	DHS	Total
Excellent	Count	8	5	13
	% within group	40%	25%	32.5%
Good	Count	6	9	15
	% within group	30%	45%	37.5%
Fair	Count	3	2	5
	% within group	15%	10%	12.5%
Poor	Count	3	4	7
	% within group	15%	20%	17.5%
Total	**Count**	**20**	**20**	**40**
	% within group	**100%**	**100%**	**100%**

Table 20 (a). Cross Tabulation for Functional Results

	Value	Approx. Sig.
Nominal by nominal contingency coefficient	0.221	0.481
No. of valid cases	40	

Table 20 (b). Symmetric Measures

DISCUSSION

Early operative treatment of trochanteric fracture reduces both the mortality and morbidity (Laskin, Gruber and Zimmerman, 1979) giving best chance of early independency and reducing the risks of prolonged bed rest. In the management of peritrochanteric fractures of femur, it is of at most importance to re-establish bone to bone contact of the posteromedial cortex.

Comparative studies[1,3,4] show that failure of fixation occurs at approximately the same frequency for intramedullary and extramedullary devices and that intramedullary nails have the added disadvantages of being associated with femoral shaft fractures. Because of these factors, some authors recommend using intramedullary devices only for the treatment of unstable trochanteric fractures.[2,5,6,] The question arises whether the PFN with its new design is associated with fewer major implant specific problem with the PFN, which has a narrower distal diameter and added distal flexibility.[6,7,8]

The Proximal Femoral Nail (PFN), AO-ASIF devices introduced in early 1997 was designed to reduce the risk of implant-related complications. Studies have shown that the screw cutout occurred by varus collapse and concomitant rotation of the femoral head around the neck axis (Seral B, et al, 2004; Sommers M B et al, 2004). Therefore, in addition to the 8 mm load bearing femoral neck screw, the PFN has a 6.5 mm anti-rotation screw to increase the rotational stability of the neck fragment. An anatomic 6-degree neck valgus bend in the coronal plane, a narrower distal diameter and distal flexibility of the nail eliminates the need for routine reaming of the femoral shaft and also minimises the stress concentration and tension in the femoral shaft. This should reduce the risk of intraoperative and postoperative femoral shaft fractures.

The rate of failure of fixation in our patients lies in the range reported by other authors using other intramedullary nails. Failure of fixation is related to the quality of fracture reduction and positioning of the screws.[2,9,10,11] Open reduction is recommended if closed reduction is not satisfactory. Some authors have reported that rotational instability of the femoral head-neck fragment (a component of the cutout mechanism) may occur when the screw is not placed centrally in the femoral head.[12,13] The superomedial quadrant of the femoral head has been identified as a high-risk zone for cutouts.[2,14,11] Precise placement of the screw is not always achieved and as much as 21.4% of unsatisfactory positioning of screws has been reported.[2,9,15,14] This problem can be reduced if attention is paid to certain operative techniques. Poor positioning of screws can occur because of problems with the jig. The jig can loosen during maneuvering of the nail in the intramedullary canal. The jig should be tightened again before beginning the screw positioning procedure.

The aim of our study is to assess the epidemiology and functional outcomes of peritrochanteric fractures with this newer method of intramedullary fixation with proximal femoral nail as compared to the proven method of DHS. We assessed the results with respect to intraoperative details, postoperative results and functional outcome.

Menzes et al[16] (2005) in a clinical study of 155 consecutive patients treated with proximal femoral nail reported failure of fixation in 2% femoral shaft fractures in 0.7%. Fixation failures included one cutout, one delayed fracture healing and one lateral displacement of the anti-rotation screw. In our study, there was no case of failure of fixation, one case of varus angulation and one case of lateral cortex fracture.

Simmermacher et al (1999) in a clinical multicentre study reported technical failures of the PFN after poor reduction, malrotation or wrong choice of screws in 5% of cases.

Christian Bold et al in his study of 55 patients of proximal femoral fractures with PFN noted 3 cases with Z effect and two patients with reverse Z effect. Two patients had screw cutout without any relation to the fracture pattern. In our study, there were no cases with Z effect due to good selection of screw lengths and shorter derotation screw. No case of screw cutout was noted in our study.

Pavelka et al also in his study of 147 patients with proximal femoral fractures treated with PFN noted fracture healing in 95% patients in 6 months with intraoperative complications like incomplete reduction in 4 cases, fixation in distraction in 2 cases and fracture at the site of distal locking in 2 cases. We had bony union in 90% cases in an average of 4 months with no iatrogenic femoral fractures in our PFN series.

	Boldin et al (PFN)	Pavelka et al	Menzes et al	Simmermacher et al	Our Study - DHS	Our Study - PFN
Bony union	100%	95%	-	-	85%	100%
Delayed union	-	5%	2%	-	15%	20%
Implant failure	3.60%	4%	0.8%	0.6%	15%	0%
Failure of fixation	0%	-	2%	5%	5%	0%
Anatomic reduction	61.80%	95%	80%	86%	78%	92%
Z effect	-	-	-	-	-	Nil
Nonunion	-	-	0.8%	-	Nil	Nil

Table 21. Comparison with Other Studies

CONCLUSION

An intertrochanteric fracture of the femur is common in the elderly due to osteoporosis and in young due to high velocity trauma. As the fracture is more common in the elderly, early reduction and internal fixation increases patient comfort, facilitates nursing care, helps in early mobilisation of the patient and decreases the duration of hospitalisation. Anatomical reduction can be achieved by closed manipulation or open methods. As the incidence of comminution is high, these fractures may require a stable reduction and internal fixation. Bone grafting is required if there is a deficiency.

Osteosynthesis with PFN offers the advantages of high rotational stability of the head-neck fragment, an unreamed implantation technique and the possibility of static or dynamic distal locking. Proximal femoral nail has the advantage of collapse at fracture site and is biomechanically sound.

Most of the complications are surgeons and instruments related, which can be cut down by proper patient selection and good preoperative planning. Because of the increasing occurrence in younger age groups, higher demand is placed on the treating surgeon to restore near normal function of leg. Postoperatively, early mobilisation can begin as the fixation is rigid and the implant designs are good.

In the light of these results, one can conclude that the proximal femoral nail despite few unfavourable results and complications. It is a satisfactory method of treatment in intertrochanteric fractures with comminution and instability. The anatomical and functional rates are comparable with that of DHS.

Proximal femoral nailing creates a shorter level arm, which translates to a lower bending moment and a decreased rate of mechanical failure. In our study, we have concluded that all reverse oblique fractures are to be managed by PFN only as the chances of failure of fixation are very high with extramedullary devices.

The nails are load sharing implants, whereas extramedullary devices are load bearing.

In our series, we found that PFN was superior to DHS in many ways such as reduced intraoperative blood loss, lesser operative time, reduced radiation exposure, less amount of shortening, reduced hospital stay, lesser infection rates and early mobilisation.

Nailing has the advantage of providing rotational as well as axial stability in cases of these fractures of allowing a faster postoperative restoration of walking ability when compared with the dynamic hip screw.

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