

MANAGEMENT OF INTERTROCHANTERIC FRACTURES WITH PROXIMAL FEMORAL NAIL AND DYNAMIC HIP SCREWS – COMPARISON THEREOF

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Abstract:

The prospective study conducted to manage the intertrochanteric fracture of femur with PFN and DHS. We have interpreted the results and compare the advantages and disadvantages of both the implants. By taking into consideration the operation time blood transfusion hospital stay blood loss and functional outcome. 45 patients in the age group of 50 to 80 years, 30 male and 15 female were included in our study. Group A and Group B were formed to treat the patient with DHS and PFN. Group A for dynamic hip screw fixation and for Group B for proximal femoral nailing. There was no significant difference between two groups with respect to prospective mobilization, blood transfusion and hemoglobin loss. In functional outcome between the two groups was almost equal however PFN had an edge over DHS in terms of blood loss, neck shaft angle, shortening and operative time.

Key words: Intertrochanteric fractures unstable fractures dynamic hip screw and proximal femoral nail

INTRODUCTION:

Several implants are used for fixation of intertrochanteric fractures. Presently extramedullary compression device, dynamic hip screw and intramedullary device proximal femoral nail are mostly used for these fractures. Dynamic hip screw gives collapsible fixation in order to allow proximal fragments to collapse on the distal one. Proximal femoral nail is intramedullary device and has various advantages like the load transfer in more efficient manner, shorter lever arm results in late transfer of the stress and implant failure, advantage of controlled rotation bending stability is maintained. There is limitation in sliding by intramedullary location so less shortening and deformity, less soft tissue dissection and less operative time. In view of all these conditions we have planned to study the results of PFN and DHS and the management of

intertrochanteric fractures.

Previously the implants which were used for the management of intertrochanteric fractures like like wood screws, quadriflanged nail, smith peterson triflanged nail^{1,2}, are not in use today.

Richard's nail with side plate was further modified to solid cannulated sliding nail with barrel, as dynamic hip screw. It is still being used today. Similarly various condylocephalic devices like, Ender's nail, Kuncher's nail, Zickel nail, Gama nail were utilized but finally biomechanically stable device PFN was introduced in 2001.

Controlled concentric collapse is the principle for achieving the union of intertrochanteric fractures. DHS & PFN allowed controlled concentric collapse of the fracture fragments^{3,4} due to sliding property of the screw in the barrel as well as

in the medullary nail.

MATERIAL AND METHODS

All fractures classified by Boyd & Griffin & Muller – AO classification of inter trochanteric fractures, between the age group of 50 to 80 years, fractures less than 02 weeks duration in both male & Female were included in this study.

Intertrochanteric fracture in patients of less than 50 years of age & more than 80 years of age were excluded. Fracture of more than two week’s duration & pathological fracture were also excluded.

It is multicentric study & 45 patients were included in study divided in group A. consist of 22 patients treated with DHS & Group B. consist of 23 patients fracture treated with PFN.

Analysis of the results were made on the basis of mobility score⁵, that considered there specific features, which included the patient’s ability to ambulate outside, ambulate within the place of residence, and the ability to go shopping (parker & palmer mobility score). Outcome of the results were assessed by the Harris hip score. In our study patients managed by PFN & DHS for trochanteric fractures were followed after 4.6.8& 12 months. Pain over the operated site, the haemoglobin, radiological assessment for the position of screw and neck shaft angle , range of motion, Harris hip score, parker & Palmar mobility score’s, were used.

RESULT

The youngest patient was 50 years and oldest patient was 76 years. There were 29 patients of right sided intertrochanteric fractures and 16 patients were having left sided fractures. There are 30 males in 15 females included in the study. In stable intertrochanteric fractures fixation was made with dynamic hip screw in 17 cases and proximal nail in 13 cases. Unstable fractures were fixed with proximal femoral nail in 10 cases and DHS in 5 cases. Assessment of stable and unstable fractures is made by Parker and Palmar mobility score. There are four classic intertrochanteric fracture patterns that signify instability. The unstable fracture pattern includes reverse obliquity fractures, transtrochanteric fractures, fractures with a large

posteromedial fragment implying loss of calcar buttress and fractures with subtrochanteric extension. These fractures in general should be treated with an intramedullary nail because of more favourable biomechanical properties of intramedullary nail compared with a sliding hip screw.

The incision size and blood loss in DHS group it was 7.0 cm and 250 ml respectively, & in PFN group is very less, an average of 4.0 cm and 130 ml respectively. There were no immediate and late complications in DHS group but in PFN group one patient had late Z effect. The varus angle in DHS group is 120 degree and PFN group it is 130 degrees 48% of patient treated with DHS resumed the same job and in PFN 56% patients resumed their original job.

Table 1 Pre-operative finding of 45 patients

	DHS	PFN
Mean age (years)		
Male	66.2	71.6
female	72.3	75.8
Mean timing of operation following injury (facture)		
Days after the fracture	9.2	5.6
Fracture type		
Stable	17	13
Unstable	5	10

Table 2 operative and post operative 45 patients fixed with DHS/PFN

	DHS	PFN
Mean length of incision (cms)	7.0	4.0
Mean operating time (mins)	75	60
Mean intra operative blood loss (ml)	250	130
Wound drainage (ml)	65	25

Table 3 Clinical and radiological results

Parameters	DHS	PFN
Shortening (cms)	1.6	.7
Varus angulation degrees	120	130
Screw cut-out/Z effect	0	1
Mean time to full weight bearing (week)	5 week	4 week
Harris hip score	80	86
Hip rom (degrees)	105	120
Flexion	105	110
Extension	8	12
Abduction	35	40
Adduction	15	20
Internal rotation	15	20

External rotation	25	30
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Results of two groups reveals that there were no noticeable difference between the two groups in the rate of post operative mobilization. Despite the difference in per-operative blood loss, the haemoglobin levels and the requirements for blood transfusion were similar in two groups. There was no significant difference in hospital stay between the two groups. Although the mobility score was identical, in both the groups but ability to walk outside was much better at those time periods for the patients who had proximal femoral nailing. The use of assistive device was not found to differ between the two treatment groups.

As per Harris hip score which is based on assessment of pain, hip function, gait, limb length discrepancy and union at the fracture site, we have obtained the following results:

Implant	No of cases	Excellent	Good	Fair	Poor
DHS	22	15	3	2	2
PFN	23	17	4	1	1

DISCUSSION

There was no significant difference between the two groups with regard to functional recovery. Baumgartner⁶ conducted a prospective study of 135 patients who were treated with a sliding hip screw or proximal femoral nail in which it was revealed that PFN device was associated with 23% less surgical time and 44% less blood loss and our results are consistent with Baumgartner because we had more surgical time in the plate than with the nail. However Baumgartner did not recommend PFN in stable fracture, our study also shows that the time taken to mobilize with a frame is shorter with PFN than with that of DHS. The reason for this may be various post operative factors like pain, muscle dysfunction and medical co morbidities. The preoperative blood loss was significantly less with the proximal femoral nail, probably because of closed operative technique which requires only 03cm incision and a small split in the abductor musculature, whereas in contrast, the DHS needs a much longer incision and elevation of the vastus lateralis. Despite these advantages we were unable to so any benefit for the patients, since the post operative haemoglobin levels and transfusion requirements of the two groups were all most similar.

The mean operative time was less in case of PFN in comparison to dynamic hip screw. There was a Z effect in

one case and PFN was removed in that case. The better mobility after treatment with proximal femoral may be explained by the fact that these patients had less limb shortening, this was specifically true in cases of unstable fracture. The mean intra operative blood loss was 250 ml in DHS group and in the PFN group it was 130ml. The difference was significant. The shortening of the DHS group was 1.6 cm and in the PFN group it was .7cm. This difference was significant

The neck shaft angle in DHS group was 120⁰ while in PFN group it was 130⁰. The mean time to full weight bearing was 5 weeks in DHS and 4 weeks in PFN. This difference was not significant. In the DHS group excellent result was 68% , good was 14% , fair was 9% and poor in 9% patients and in PFN group excellent was 74% good was 18% fair was 4% & poor was in 4% of patients

CONCLUSION

It is apparent from the functional outcome that both the divices have the similar results in stable fractures but PFN is the choice of the implants in stable fractures and gives better results than the DHS. More over there is a shorter operative time in PFN hence the PFN has more advantage over DHS even in stable intertrochanteric fractures. Our study indicates that PFN is a better fixation device than DHS in unstable fractures.

REFERENCES

1. Cambell’s operative orthopedics 12th edition, page-2737-55
2. Chapman’s orthopedic surgery 3rd edition, page 635-651
3. Comparative study of intertrochanteric fracture femur treated with dynamic hip screw and proximal femoral nailing by Jaswinder pal singh Walia, Himanshu tailor et al. Pb journal of clinical orthopedics vol- xiv, No 1 -2013
4. Comparative prospective study of proximal femoral nail and dynamic hip screw in the treatment of intertronchantric fracture femur by Ranjeet kumar,

R.N. Singh et al, journal of clinical orthopedics and trauma 2012;3: 28-36

5. Al-yasari G- Langastaff R.J. Jones J.W, Al Lami M. The A.O. ASIF proximal femoral nail (PFN) for the treatment of unstable trochanteric fracture, Injury 2002;16:386-93
6. Baumgaertner MR. Curtin SL. Lindskog DM. Intramedullary versus extramedullary versus extramedullary fixation for the treatment of intertrochanteric hip fractures. Clin Orthop. 1998;348:87-94