

A study of dynamic HIP screw versus proximal trochanteric contoured plate in proximal end fractures of femur

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Abstract

Background: Intertrochanteric fractures are common injuries occurring predominantly as low-energy injuries in the elderly, mostly due to direct injury to hip (e.g. fall). **Aims and Objectives:** To Study Dynamic HIP screw versus Proximal trochanteric contoured Plate in proximal end fractures of femur. **Materials and Methodology:** This study carried out at the Orthopedic department of a tertiary health care center during two-year duration January 2015 to January 2017 in the patients who were diagnosed as Proximal trochanteric contoured proximal end fractures of femur were assessed for the Operative procedure were informed about two different modes of operation i.e. Dynamic HIP screw versus Proximal trochanteric contoured Plate and their 40 patients were enrolled in each group with their written consent. Harris score used for assessment and statistical analyses done by un-paired t -test. **Result:** The majority of the Patients were in the age group of 60-80 i.e. 36.25 % followed by 50-60 i.e. 27.5 % ; 40-50 were 15.00% ; in 30-40 age group were 8.75 % and in age > 80 were 7.5%. The majority of the patients were Females i.e. 58.75% and 41.25% were Males Overall Harris score significantly higher in DHS group as compared to PFLP i.e. 89.4 ± 2.1 and 83.5 ± 3.2 ($p < 0.001, t = 4.96, df = 18$) for IT fractures the score was 84.4 ± 3.4 and 78.9 ± 3.9 ($p < 0.0019, t = 3.5, df = 21$); Stable IT 93.7 ± 2.9 and 76.5 ± 1.2 ($p < 0.0001, t = 15.5, df = 14$); Unstable IT 79.2 ± 1.7 and 80.3 ± 1.89 which is not significant ($p < 0.29, t = 1.094, df = 11$); for ST 85.4 ± 1.5 and 89.5 ± 2.45 ($p < 0.001, t = 4.96, df = 18$) respectively. **Conclusion:** Except Unstable IT fracture DHS was found to be superior over PFLP with respect to Harris score.

Key Words: Dynamic HIP screw (DHS), PFLP (proximal femoral locking plate), Harris score.

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INTRODUCTION

Intertrochanteric fractures are common injuries occurring predominantly as low-energy injuries in the elderly, mostly due to direct injury to hip (e.g. fall). The financial burden to the society is tremendous.^{1,2} Cooper was the first one to classify hip fractures into extracapsular (intertrochanteric) and intracapsular (femoral neck).³

Since the 1800s, a lot has changed in the way these fractures are managed. From conservative treatment (including hip spica and pin traction) with bed rest, to the operative fixation with modern surgical techniques and implants, we have come a long way. Early attempts at surgical management were marred by poor asepsis, lack of intraoperative imaging, poor implant design and quality, and incomplete understanding of fracture mechanics. Langenbeck was the first to internally fix an intertrochanteric fracture with a nail.⁴ The modern era of hip fracture fixation began in 1925 when Smith Peterson introduced a triflanged nail.⁵ The real benefit of fixation lies not in improving union rates (intertrochanteric fractures rarely go into nonunion, even when treated conservatively), but in improving functional outcome and mortality rates, which are attributed to the early mobilization and better nursing care possible after surgery. Many implants have been used for fixation: Smith Peterson nail, Jewett nail, trochanteric buttress

plate, angled blade plate, gotfried percutaneous compression plate enders nail, dynamic hip screw (DHS), medoff plate, cephalomedullary nails, and proximal femur locking plates. Pugh and Massie first developed the DHS in 1950s by modifying the sliding hip screw systems^{6,7} and quickly became the gold standard. Even as widespread use of DHS revealed some complications, it is still considered the gold standard by many.^{8,9,10} DHS is the most commonly used implant worldwide for fixation of intertrochanteric fractures. The two important complications related to DHS are uncontrolled collapse and lag screw cut-out (with or without varus collapse).¹¹

MATERIALS AND METHODS

This study carried out at the Orthopedic department of a tertiary health care center during two-year duration January 2015 to January 2017 in the patients who were diagnosed as Proximal trochanteric contoured proximal end fractures of femur were assed for the Operative procedure were informed about two different modes of operation i.e. Dynamic HIP screw versus Proximal trochanteric contoured Plate and their accordingly advantages and disadvantages so such 40 patients were enrolled in each group with their written consent. After

operative procedure each patient was assessed by harris hip score were assessed at the end of 6 months.

RESULT

Table 1: Distribution of the Patients as per the Age

Age group	No.	Percentage
20-30	4	5
30-40	7	8.75
40-50	12	15
50-60	22	27.5
60-80	29	36.25
>80	6	7.5
Total	80	100

The majority of the Patients were in the age group of 60-80 i.e. 36.25 % followed by 50-60 i.e. 27.5 % ; 40-50 were 15.00% ; in 30-40 age group were 8.75 % and in age > 80 were 7.5%.

Table 2: Distribution of the Patients as per the Sex

Sex	No.	Percentage (%)
Male	33	41.25
Female	47	58.75
Total	80	100

The majority of the patients were Females i.e. 58.75% and 41.25% were Males.

Table 3: Distribution of the patients as per Average Harris Score for the patients treated by DHS and PFLP

Type of Fracture	DHS		PFLP		P-Value (Un-paired t-test)
	Average Score ± SD	No. of Cases	Average Score ± SD	No. of Cases	
Overall	89.4 ± 2.1	11	83.5 ± 3.2	9	p<0.001,t=4.96,df=18.
IT	84.4 ± 3.4	10	78.9 ± 3.9	13	p<0.0019,t=3.5,df=21.
Stable IT	93.7± 2.9	8	76.5 ± 1.2	8	p<0.0001,t=15.5,df=14.
Unstable IT	79.2± 1.7	6	80.3± 1.89	7	p> 0.05,t=1.094,df=11.
ST	85.4 ± 1.5	5	89.5 ± 2.45	3	p<0.001,t=4.96,df=18.
Total		40		40	

Overall Harris score significantly higher in DHS group as compared to PFLP i.e. 89.4 ± 2.1 and 83.5 ± 3.2 (p<0.001,t=4.96,df=18) for IT fractures the score was 84.4 ± 3.4 and 78.9 ± 3.9 (p<0.0019,t=3.5,df=21); Stable IT 93.7± 2.9 and 76.5 ± 1.2 (p<0.0001,t=15.5,df=14); Unstable IT 79.2± 1.7 and 80.3± 1.89 which is not significant (p<0.29,t=1.094,df=11) ; for ST 85.4 ± 1.5 and 89.5 ± 2.45 (p<0.001,t=4.96,df=18) respectively.

DISCUSSION

Mechanisms of DHS and PFLCP are quite different in the sense that DHS allows controlled collapse of fracture while locking plate is an angular stable construct preventing any shortening or collapse. Hence, there is less propensity of limb shortening in PFLCP. Owing to the

locking construct, theoretically, PFLCP also has a lower risk of varus collapse and screw cut-out. However, clinically, this has shown not to be the case. 12 Although earlier biomechanical studies showed PFLCP to be equivalent or stronger than other fixation constructs in pertrochanteric and neck fractures,^{13, 14} more recent studies have shown intramedullary nails to be superior¹⁵. In our study we have found that The majority of the Patients were in the age group of 60-80 i.e. 36.25 % followed by 50-60 i.e. 27.5 % ; 40-50 were 15.00% ; in 30-40 age group were 8.75 % and in age > 80 were 7.5%. The majority of the patients were Females i.e. 58.75% and 41.25% were Males. Overall Harris score significantly higher in DHS group as compared to PFLP i.e. 89.4 ± 2.1 and 83.5 ± 3.2 (p<0.001,t=4.96,df=18) for

IT fractures the score was 84.4 ± 3.4 and 78.9 ± 3.9 ($p < 0.0019, t = 3.5, df = 21$); Stable IT 93.7 ± 2.9 and 76.5 ± 1.2 ($p < 0.0001, t = 15.5, df = 14$); Unstable IT 79.2 ± 1.7 and 80.3 ± 1.89 which is not significant ($p < 0.29, t = 1.094, df = 11$); for ST 85.4 ± 1.5 and 89.5 ± 2.45 ($p < 0.001, t = 4.96, df = 18$) respectively. From this it clear that except Unstable IT DHS was superior to PFLP in terms of Harris score. These findings are similar to Prabhat Agrawal *et al*¹⁶ they found Both DHS and PFLCP are good choices for stable intertrochanteric fractures, and both lead to excellent functional outcomes, but non-union might be more common with PFLCP so DHS can be considered superior to PFLP as it is having less complications.

CONCLUSION

Except Unstable IT fracture DHS was found to be superior over PFLP with respect to Harris score

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