



بسم الله الرحمن الرحيم

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Proximal Femoral Nail versus Dynamic Hip Screw in Fixation of Unstable Intertrochanteric Fractures of Femur (Systematic Review & Meta-Analysis)

Systematic Review/Meta-Analysis

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in Orthopedic Surgery*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العليم

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List of Contents

Title	Page No.
List of Tables.....	i
List of Figures.....	iii
Introduction	1
Aim of the Work.....	4
Review of Literature.....	5
Materials and Methods.....	71
Results.....	77
Discussion	91
Summary and Conclusion	100
References	102
Arabic Summary	

List of Tables

Table No.	Title	Page No.
Table 1:	Characteristics of included studies (n=15).....	77
Table 2:	Extraction sheet for Parker mobility score when comparing PFN against DHS in unstable intertrochanteric fracture:	79
Table 3:	Extraction sheet for modified Harris Hip score when comparing PFN against DHS in unstable intertrochanteric fracture:	80
Table 4:	Extraction sheet for Quality of reduction when comparing PFN against DHS in unstable intertrochanteric fracture:	81
Table 5:	Extraction sheet for time needed for full union (Days) when comparing PFN against DHS in unstable intertrochanteric fracture:	82
Table 6:	Extraction sheet for operation time when comparing PFN against DHS in unstable intertrochanteric fracture:	83
Table 7:	Extraction sheet for post operative blood loss when comparing PFN against DHS in unstable intertrochanteric fracture:	84
Table 8:	Extraction sheet for length of hospital stay (Days) when comparing PFN against DHS in unstable intertrochanteric fracture:	85
Table 9:	Extraction sheet for Non-Union prevalence when comparing PFN against DHS in unstable intertrochanteric fracture:	86
Table 10:	Extraction sheet for Varus malunion prevalence when comparing PFN against DHS in unstable intertrochanteric fracture:	87

List of Tables *cont...*

Table No.	Title	Page No.
Table 11:	Extraction sheet for Collapse and shortening prevalence when comparing PFN against DHS in unstable intertrochanteric fracture:.....	88
Table 12:	Extraction sheet for backing out of hip screw prevalence when comparing PFN against DHS in unstable intertrochanteric fracture:.....	89
Table 13:	Extraction sheet for post operative infection when comparing PFN against DHS in unstable intertrochanteric fracture:	90

List of Figures

Fig. No.	Title	Page No.
Figure 1:	The hip joint.	5
Figure 2:	Proximal end of the right femur. A. Anterior. B. Medial.	6
Figure 3:	Proximal end of the right femur. C. Posterior, D. Lateral.	6
Figure 4:	The neck shaft angle.	7
Figure 5:	Proximal end of femur.....	8
Figure 6:	The calcar femorale.....	10
Figure 7:	Ward's triangle (W) and the five- trabecular groups.	11
Figure 8:	Hip muscles, anterior view.	13
Figure 9:	Hip muscles, lateral view.....	13
Figure 10:	Under normal anatomic conditions, the correlation between body weight.	19
Figure 11:	Biomechanics of Dynamic compression hip screw.	22
Figure 12:	Schematic for calculating the tip-to-apex distance (TAD), with ideal position of the compression screw.....	24
Figure 13:	Position of compression screw in femoral head and compression screw cut out incidence.....	24
Figure 14:	Measurement of the cortical thickness index on AP view	28
Figure 15:	The Trochanteric Stabilizing Plate (TSP)	30
Figure 16:	Difference between biomechanics of intramedullary and extra medullary fixation devices.....	31

List of Figures cont...

Fig. No.	Title	Page No.
Figure 17:	A) TAN, B) PFN, C) PFNA	33
Figure 18:	Evans Classification	35
Figure 19:	AO classification of trochanteric femur Fractures.	38
Figure 20:	AP and lateral views of trochanteric fracture.....	43
Figure 21:	CT scan of trochanteric fracture.....	43
Figure 22:	Non displaced intertrochanteric fracture, not visible on AP radiograph, but can be identified on T1-weighted MRI.....	44
Figure 23:	Skeletal traction in hip fractures.	47
Figure 24:	Dynamic hip screw	51
Figure 25:	X-ray of a right intertrochanteric fracture stabilized with a sliding hip screw and a lateral buttress plate.....	52
Figure 26:	The Trochanteric Stabilizing Plate (TSP).	53
Figure 27:	Proximal femur locking compression plate.	54
Figure 28:	External fixator in trochanteric fractures.....	55
Figure 29:	El-Shafie plate.....	56
Figure 30:	Proximal femoral nail.	58
Figure 31:	Proximal femoral nail antirotation	58
Figure 32:	Lag screw cut out.	60
Figure 33:	Valgus reduction with lag screw placement in the inferior zone on AP & posterior zone on lateral view.....	61
Figure 34:	Schematic for calculating the tip-to-apex distance (TAD).....	62

List of Figures cont...

Fig. No.	Title	Page No.
Figure 35:	Varus collapse and medialization.....	63
Figure 36:	X-ray showing non-union of intertrochanteric fracture and implant breakage after stabilization by (DHS).....	64
Figure 37:	AP x-ray showing nail breakage.....	67
Figure 38:	Parker Mobility Score	73
Figure 39:	PRISMA flow chart of the literature search process	76
Figure 40:	Forest plot for Parker mobility score when comparing PFN against DHS in unstable intertrochanteric fracture.	79
Figure 41:	Forest plot for modified Harris Hip score when comparing PFN against DHS in unstable intertrochanteric fracture.....	80
Figure 42:	Forest plot for quality of reduction when comparing PFN against DHS in unstable intertrochanteric fracture	81
Figure 43:	Forest plot for time needed for full union when comparing PFN against DHS in unstable intertrochanteric fracture.....	82
Figure 44:	Forest plot for operation time when comparing PFN against DHS in unstable intertrochanteric fracture	83
Figure 45:	Forest plot for post operative blood loss when comparing PFN against DHS in unstable intertrochanteric fracture.	84
Figure 46:	Forest plot for length of hospital stay when comparing PFN against DHS in unstable intertrochanteric fracture	85

List of Figures cont...

Fig. No.	Title	Page No.
Figure 47:	Forest plot for Non-Union prevalence when comparing PFN against DHS in unstable intertrochanteric fracture	86
Figure 48:	Forest plot for varus malunion prevalence when comparing PFN against DHS in unstable intertrochanteric fracture.....	87
Figure 49:	Forest plot for collapse and shortening prevalence when comparing PFN against DHS in unstable intertrochanteric fracture.	88
Figure 50:	Forest plot for backing out of hip screw prevalence when comparing PFN against DHS in unstable intertrochanteric fracture.	89
Figure 51:	Forest plot for post operative infection when comparing PFN against DHS in unstable intertrochanteric fracture.	90

INTRODUCTION

Intertrochanteric femoral fractures are common in the elderly. They account for more than 50% of all hip fractures and are a common orthopedic problem in this age group. They are extra capsular fractures of the proximal femur between the greater and lesser trochanters. Due to the mortality and significant morbidity associated with these fractures, they constitute a major challenge to all orthopedic surgeons ⁽¹⁾.

The incidence of hip fractures increases upon aging, so that 90% occur after the age of 70. The lifetime risk of hip fracture is 23.3 % for a woman and 11.2% for a man respectively. The estimated rate for elderly people sustaining a hip fracture by the age 90 is 30% ⁽²⁾.

The risk for falls is increased by advanced age, problems in motor control and various chronic and acute disease. It was reported that low body mass index, institutional residence, previous stroke with hemiparesis, Parkinson's disease and use of neuroleptics were significantly more common among hip fracture patients than among fallers who did not sustain a hip fracture ⁽³⁾.

Studies show that 40 % of trochanteric femoral fractures are unstable which have higher failure rate with conventional treatment options than stable ones. The inherent instability of these fractures is due to many factors which are lateral femoral wall insufficiency, fracture of the posteromedial calcar and extension to sub-trochanteric area. Intact lateral wall plays a key role in stabilization

of unstable intertrochanteric Fractures by providing a lateral buttress for proximal fragment, and its deficiency leads to excessive collapse and Varus malpositioning ⁽⁴⁾.

Dynamic hip screw (DHS) with buttress plate stabilizes the unstable intertrochanteric fracture but at the cost of open procedure with significant blood loss. The locking plate technology coupled with built-in metaphyseal contour enables fixation using the minimally invasive plate osteosynthesis (MIPO) technique, but the literature describes a high complication rate ⁽⁵⁾.

In the early 1990s, a new fixation device was introduced for the treatment of unstable intertrochanteric fractures. This device consisted of a short intramedullary nail that was placed through the greater trochanter, with a large-diameter proximal interlocking screw that was inserted in a retrograde fashion up the femoral neck. The earliest version of this device was the Gamma nail (introduced by Howmedica, now Stryker, Kalamazoo, Michigan). Since the introduction of the Gamma nail, several similar intramedullary fixation devices of different design have been introduced by other companies ⁽⁶⁾.

The shorter lever arm (to decrease tensile strain on the implant), the lack of a requirement of an intact lateral cortex, the improved load transfer (as a result of medial location), the potential for closed fracture reduction, percutaneous insertion, shorter operative time, minimize soft-tissue dissection, thereby

reducing surgical trauma, blood loss, and wound complications are advantages of intramedullary devices ⁽⁷⁾.

Intramedullary nailing has become a popular method of stabilization of unstable intertrochanteric fractures in adults. Biomechanically it is a better choice of implant for fixation of unstable fractures as nail itself gives support to posteromedial wall and resists excessive collapse ⁽⁸⁾.

Near-anatomical reduction and optimal positioning of implants are of paramount importance for good outcome and reducing the risk of complications. Still there are some pitfalls as implant failure does occur in proximal femoral nail (PFN) due to specific unbalanced biomechanical forces acting on implant around hip joint. A common complication of the PFN surgery is implant failure, which can be due to back out of screws, cut through of implant through bone, “Z” effect, and ‘reverse Z’ effect or breakage of implant ⁽⁹⁾.

Unstable intertrochanteric femur fractures continue to be a challenge for orthopedic Surgeons. Despite high union rates, the functional outcomes still tend to be disappointing. Use of sliding hip screw in unstable intertrochanteric fractures is associated with significant medial displacement of the shaft resulting from excessive sliding of screw within the barrel and a higher incidence of screw cut-out ⁽¹⁾.

AIM OF THE WORK

The aim of the study is to compare between the use of DHS and proximal femoral nail in treatment of unstable intertrochanteric fractures of the Femur through systematic review and met analysis.

***Primary objective:**

The primary objective of our study is to assess the functional outcome after using each of the two devices in treatment of unstable intertrochanteric fractures.

***Secondary objectives:**

The study also compares the difference between DHS and proximal femoral nail in other aspects like operative time, intra-operative bleeding, length of incision, complication rates and union.