بسم الله الرحمن الرحيم

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بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

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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

Submitted for Partial Fulfilment of Master Degree in Orthopedic Surgery

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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.