



Comparison Between Dynamic Hip Screw and Proximal Femoral Nail in Patients with Stable Pertrochanteric Fractures.

A Retrospective Comparison

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Received Date: March 13, 2023

Published Date: April 01, 2023

Abstract

Objective: To compare dynamic hip screw and proximal femoral nail in patients with stable pertrochanteric fractures in terms of functional outcome.

Study Design: It was a retrospective observational study.

Settings: This study was carried at Department of Orthopedic & Spine Surgery, Dr Ziauddin Hospital, Clifton, Karachi.

Duration: 4 years from March 2017 to March 2021.

Methodology:

The total number of patients was 86. Patients' functional status was evaluated using the Harris Hip Score (HHS), which was categorized as poor (score 70), fair (score 70 to 80), good (score 80 to 90), and excellent (90 to 100). During the third, sixth, and twelfth months, both groups' results were compared, and a P-value was determined using an independent sample t-test. $P < 0.05$ was considered significant.

Conclusion: Both DHS and PFN yielded almost similar functional outcomes with almost similar scores at 3rd, 6th and 12th months with PFN showing a slightly higher score at all 3 intervals. According to these statistics the operating surgeon can use any of the two implants according to the need of the hour and expect almost similar functional outcomes.

Keywords: Dynamic Hip Screw (DHS); Harris Hip Score; Intertrochanteric fractures; Proximal Femoral Nail (PFN).

Introduction

The fractures of the metaphysis of the proximal femur that affect the area between the diaphysis and the femoral neck are called pertrochanteric fractures. These fractures are also called intertrochanteric fractures [1]. These fractures are associated to high morbidity and mortality rates, just like other hip fractures. Almost half of the 280,000 fractures that occur each year are intertrochanteric fractures. It is estimated that by 2040 their number will increase by 500,000 people [6]. Currently, fractures of the proximal femur account for 30% of fractures referred to hospitals for treatment [7]. In 1990, intertrochanteric fractures in Asia were observed to be 26% of hip fractures, while this figure may increase to 37% in 2025 and 45% in 2050 [8]. The dynamic hip screw (DHS) is still considered the gold standard for the treatment of intertrochanteric fractures. The advantages and disadvantages of DHS are well known in many previous studies [9]. Several studies compare DHS with proximal femoral nails (PFNs), which are preferred by many [2,10]. This study was conducted to compare the functional outcomes of proximal femoral nailing (PFN) and dynamic hip screw (DHS) in the treatment of stable intertrochanteric femoral fractures (AO/OTA type 31-A1).

We aimed to evaluate clinical outcomes by comparing NFP and DHS in terms of functional outcome using the Harris hip score. We hypothesized that NFP is a better treatment for intertrochanteric fractures than DHS.

Methods

This retrospective comparative study was conducted at the Department of Orthopedic & Spine Surgery, Dr Ziauddin Hospital, Clifton, Karachi, from March 2017 to March 2021. All adult patients with stable intertrochanteric fracture of the femur (AO/OTA type 31-A1), of either gender and age, who presented acutely to the Accidents and Emergency department or the Out Patient Department of our hospital within one week of sustaining the fractures, were included in this study. Patients with pathological fractures, open fractures, segmental fractures, previous hip surgery, bilateral intertrochanteric fractures and polytrauma patients were excluded. The study protocols were approved by the hospital Ethical Committee. Patients were divided into group A (DHS) and group B (PFN) as per the treatment followed.

Surgical Techniques

All procedures were performed on an optical table under spinal or general anesthesia and under image intensification control. The surgical team performed all procedures according to standard operating procedures for DHS and PFN. The battle is near. A lateral linear incision 5-10 cm distal to a larger incision at the appropriate site was used to open the DHS entry point. The number of lateral lamellae (LCP or DCP) varies according to the availability and convenience of the surgeon. The retracted screw position was maintained behind the femoral neck and the TAD distance was less than 25 mm.

An approximately 5 cm incision is made at the apex of the larger incision as the PFN inlet. NFP with a cervical angle of 135 degrees and variable length depending on the availability and comfort of the surgeon. Distal block was used in all PFN cases.

From the first day after surgery, the postoperative recovery protocol begins under the supervision of a qualified physiotherapist. All patients were taught to perform isometric exercises and abduction exercises. Patients in both groups were allowed to walk without weight with a walker or cane on the first postoperative day. Postoperative follow-up visits were scheduled at 2 weeks, 3 months, 6 months, and 12 months. Functional outcome was evaluated using the Harris Hepp score (HHS). HHS is rated as poor (score <70), moderate (70 to 80), good (80 to 90) and excellent (90 to 100). We analyzed our data using SPSS version 24. Probabilities and percentages were calculated for qualitative variables, mean and standard deviation for quantitative variables. p-value was calculated using independent sample t-test. $P < 0.05$ was considered significant.

Results

The study's inclusion and exclusion criteria were applied to a total of 110 patients who were evaluated for eligibility, and 86 of them were enrolled. In the final analysis, 43 patients from group A (PFN) and 43 patients from group B (DHS) were included. The patients were on average 74 years old. As there were 51 (59.3%) female patients and 35 (40.6%) male patients, the patient gender ratio was 1.4:1. At the 3-month follow-up, group A had Harris Hip Score (HHS) of 47.49 ± 8.91 (poor), while group B had HHS of 34.30 ± 2.28 (poor) ($P=0.002$). At six months, the HHS scores for groups A and B were 81.26 ± 1.95 (good) and 78.28 ± 4.10 ($P=0.001$), respectively. At one year, HHS was 92.05 ± 1.67 (excellent) and 91.72 ± 1.29 (excellent) in group A and B, respectively ($p=0.30$). No mortality was noted in our series.

Table 1: Comparison of different Variables			
Outcome variable	Group A (PFN) (n=43)	Group B (DHS) (n=43)	P value
Mean Age (years) \pm SD	71.77 \pm 11.11	77.14 \pm 9.07	
Gender			
Male	16 (37.2%)	19 (44.2%)	P 0.52
Female	27 (62.8)	24 (55.8 %)	P 0.40
Surgery Side			
Right	11 (25.6%)	23 (53.5 %)	P 0.32
Left	32 (74.4 %)	20 (46.5%)	P 0.75
Harris Hip Score (HHS)			
Mean at 3 months \pm SD	47.49 \pm 8.91	34.30 \pm 2.28	P 0.002
Mean at 6 months \pm SD	81.26 \pm 1.95	78.28 \pm 4.10	P 0.001
Mean at 12 months \pm SD	92.05 \pm 1.67	91.72 \pm 1.29	P 0.30

Discussion

A hip fracture is the most common fracture experienced by orthopedic surgeons worldwide. As shown by Gallagher [1,11], fracture incidence is estimated to increase to 2.6 million and 4.5 million in 2025 and 2050, respectively.

Intertrochanteric fracture management has undergone a significant development in recent years. Many methods of connecting gadgets have come and gone. However, the type of fracture and the bone's quality affect the course of treatment. DHS has long been considered the gold standard for intertrochanteric fracture fixation [10]. A recently published study showed that PFN fixation and DHS fixation have similar efficacy in the treatment of trochanter fractures. [4]

To compare the two (DHS and PFN), we performed a retrospective study based on functional outcomes based on the calculation of the Harris Hip Score (HHS) at 3, 6 and 12 months.

This study was conducted on 86 patients from a total of 110 populations divided into two groups of 43 individuals, Group A (PFN) and Group B (DHS). At one year, HHS was 92.05 ± 1.67 (excellent) and 91.72 ± 1.29 (excellent) in groups A and B, respectively ($P = 0.30$).

Jones et al. [5] reported similar results to our study, as shown in the table below. They concluded, inter alia, that PFN is a better fixation device than DHS in stable intertrochanteric fractures.

This study has fewer limitations regarding the included variables. More studies are needed to better compare functional outcomes.

Conclusion

Both DHS and PFN yielded almost similar functional outcomes with almost similar scores at 3rd, 6th and 12th months with PFN showing a slightly higher score at all 3 intervals. According to these statistics the operating surgeon can use any of the two implants according to the need of the hour and expect almost similar functional outcomes.

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