

## ORIGINAL ARTICLE

# Dynamic Hip Screw Treatment for Intertrochanteric Fractures in the Elderly: A Summary of Results

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## ABSTRACT

**Objective:** The objective was to find out how well the Dynamic Hip Screw (DHS) worked after treating intertrochanteric fractures in older patients.

**Study Design:** A descriptive study

**Place of study & Duration:** Ayub Teaching Hospital Abbottabad and Abbottabad International Medical institute Abbottabad. May 2022 to April 2023

**Methods:** Total 190 patients of both genders were presented in this study. All senior patients who matched the inclusion criteria and had stable intertrochanteric fractures (Evans type IA and Type IB) were evaluated for functional outcome using the Harris Hip Score (HHS). Depending on the HHS score, the results were categorized as exceptional (90 to 100), good (80 to 90), fair (70 to 80), or bad (<70) at 6 months.

**Results:** We found excellent outcomes in 100 (52.6%) cases, good in 57 (30%) cases, 24 (12.2%) found fair and poor outcomes in 9(4.7%) cases.

**Conclusion:** The majority of our elderly patients who underwent Dynamic Hip Screw (DHS) treatment for stable intertrochanteric fractures had excellent and good functional outcomes. When treating stable intertrochanteric fractures in older patients, DHS is the implant of choice.

**Keywords:** Dynamic Hip Screw (DHS), Outcomes, Elder patients.

## INTRODUCTION

Trochanteric fractures have recently experienced a dramatic increase in occurrence, drawing much attention from experts around the world as a result of the rising average age of the global population.<sup>1</sup> The number of hip fractures is expected to 4.5 million in 2050 and more than quadruple to 2.6 million in 2025. From a 1990-level of 26%, the proportion of hip fractures in Asia may rise to 37% in 2025 and 45% in 2050.<sup>2</sup>

At age 50, men have a 5.6% lifetime risk of hip fracture while women have a 20% risk. This type of fracture is caused by osteoporosis in 90% of instances. Even minor falls can cause this to happen to elderly people. Their impact on health resources is significant because of the high cost of treatment required after injuries. Conservative treatment for these fractures—which includes extensive periods of bed rest to allow the fracture to heal—is associated with a high mortality rate because of the risks of complications such decubitus ulcers, UTIs, pneumonia, joint contractures, and thrombosis.<sup>3</sup> On the other hand, issues including coxavara, malunion, medialization of the shaft, and external rotation deformity can develop as a result of the fracture union, that might cause the limb to be shorter and cause the patient to limp. Because it reduces mortality risk, allows the patient to be mobile sooner after surgery, and alleviates discomfort, surgical repair is favored for trochanteric fractures. Acquiring and maintaining secure fixation in the pertrochanteric region of anatomy, which is made up of a varied blend of cortical and cancellous bone, can be challenging in the elderly due to low bone quality. Proximal femoral nail (PFN), gamma nail, dynamic hip screw (DHS), and proximal femoral nail anti rotation (PFNA) are some of the implants used in surgical procedures. It is currently debatable which implant is best for certain kinds of fractures. The main goal, combined with good union, is to restore the hip's characteristic abductor lever-arm mechanism. A biomechanical intramedullary device is the best option because it prevents varus collapse and provides better support to the posteromedial cortex.<sup>4</sup> In addition, these devices

can be implanted with minimal incisions, which helps to preserve hematomas and minimizes the chances of infection and wound complications.<sup>5</sup>

Additional options to dynamic hip screws for treating unstable inter-trochanteric fractures include gamma nails or proximal femoral nails; however, these alternatives do not come without their own set of problems.<sup>6,7</sup> Unfortunately, not all surgeons know how to properly place these more costly implants. In addition to reducing some of the hazards associated with more recent implants like gamma nails, trochanteric stabilizing plates extend the circumstances that can benefit from dynamic hip screws for unstable intertrochanteric fractures.<sup>8</sup>

Our objective was to investigate the functional results of using the Dynamic Hip Screw (DHS) to repair intertrochanteric fractures in elderly patients.

## MATERIALS AND METHODS

This descriptive study was conducted at Ayub Teaching Hospital Abbottabad and Abbottabad International Medical institute Abbottabad. May 2022 to April 2023. In our study, we included all patients who were 65 years old or older and had stable intertrochanteric fractures (Evans type IA and type IB) who visited our hospital's accident and emergency department or outpatient department (OPD) within one week of the fractures occurring. Patients with multiple fractures or those who needed surgery for other types of injuries (such as those to the head, chest, or abdomen) were not included. Excluded from the study were patients who had pathological fractures, open fractures, required re-surgery, or were unable to finish the follow-up. Our hospital's Institutional Review Board gave their clearance to the research. Every single person who took part in our study gave us their informed consent. All patients underwent a thorough evaluation that included a medical history, physical exam, and any necessary tests. Radiologically, fractures were categorized according to Evans's 14-point system for identifying intertrochanteric fractures. On elective operation day, the surgery was performed on a traction table with an image intensifier after the patient's general state was optimized. The surgical procedure required either spinal or general anesthesia. The same surgical team used the same standard

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operating procedure for each operation. Traction and manipulation helped decrease the fracture, and an image intensifier confirmed it. Patients who met the inclusion criteria were treated with DHS, and the functional outcome was less than 25 millimeters. The procedure involved fixing the patient with a 4-hole, 135° angle slide plate from Esmeco, with the appropriate lag screws positioned in the posterior inferior portion of the femur neck, while maintaining the tip-apex distance (TAD). The patient began supervised physical therapy on the day following surgery. Every patient was told to come back for a checkup after the second week, and then every four weeks for the next six months. Patients had clinical and radiological evaluations at each visit. Results were evaluated as excellent (HHS score 90 to 100), good (HHS score 80 to 90), fair (HHS score 70 to 80), and poor (HHS score <70) based on the assessment of functional outcome at the 6-month follow-up using the Harris Hip Score (HHS) 15.A version of SPSS, 23, was used for the data analysis. Mean and standard deviation (SD) were used to describe quantitative data, while frequency and percentage were used to indicate important qualitative factors. We used an independent sample t test to compare HHS by fracture type, gender, and side and to get the corresponding P value. An important result was defined as a P value less than 0.05.

## RESULTS

The patients age was  $62.71 \pm 8.16$  years. 120 (63.2%) cases were males and 70 (36.8%) cases were females. Fall was the most common cause followed by road traffic accident and physical assault. Right side was the most common side of fracture. Most common side of fracture was Evan 1A. (table 1)

Table-1: Demographics of the presented cases

| Variables        | Frequency (190)  | Percentage |
|------------------|------------------|------------|
| Mean age (years) | $62.71 \pm 8.16$ |            |
| Gender           |                  |            |
| Male             | 120              | 63.2       |
| Female           | 70               | 36.8       |
| Cause            |                  |            |
| Fall             | 80               | 42.1       |
| RTA              | 60               | 31.6       |
| Physical assault | 50               | 26.3       |
| Side             |                  |            |
| Right            | 125              | 65.8       |
| Left             | 65               | 34.2       |
| Fracture type    |                  |            |
| IA               | 120              | 63.2       |
| IB               | 70               | 36.8       |

Table-2: Outcomes among all cases

| Variables | Frequency/Percentage (190) | HHS Score      |
|-----------|----------------------------|----------------|
| Outcomes  |                            |                |
| excellent | 100 (52.6%)                | $92.6 \pm 1.8$ |
| good      | 57 (30%)                   | $86.2 \pm 4$   |
| fair      | 24 (12.2%)                 | $79.6 \pm 4$   |
| poor      | 9 (4.7%)                   | $35.8 \pm 7$   |

Post-operative complication were found in 19 (10%) cases. (fig 1)

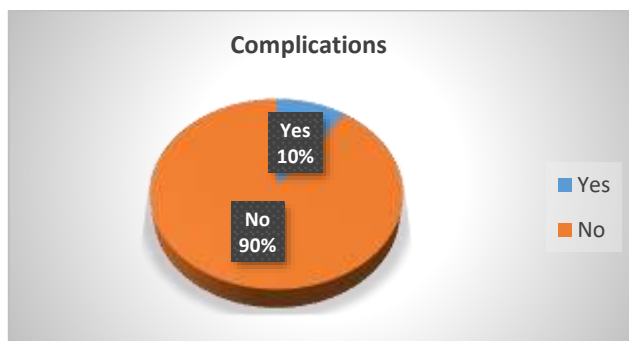


Figure-1: Frequency of complications

We found excellent outcomes in 100 (52.6%) cases with HHS score  $92.6 \pm 1.8$ , good in 57 (30%) cases with HHS score  $86.2 \pm 4$ , 24 (12.2%) found fair with HHS score  $79.6 \pm 4$  and poor outcomes in 9 (4.7%) cases with HHS score  $35.8 \pm 7$ . (table 2)

## DISCUSSION

The locations of inter-trochanter (IT) cracks are the lesser and larger trochanter regions. The two most common causes of impairment in the elderly are this disease and femoral neck fractures.<sup>9</sup> and internal fixation has taken the place of the cautious method of immobilization. Unlike intra-capsular fractures, which might occur, avascular necrosis does not occur when these fractures merge with the femoral head. Falling while walking or standing is the leading cause of inter-trochanteric fractures, accounting for approximately 75% of all cases. The final outcome is a major impairment in one's ability to stand and walk normally. Evaluation of such an injury utilizing IT is recommended for the purpose of confirming the fracture.<sup>10</sup>

Many different types of forces, both direct and indirect, can cause intertrochanteric fractures.<sup>11</sup> The iliopsoas muscle is pulled between the proximal and distal cortical regions, which can create an indirect force, even with a small fall. Abduction of the femur involves a sudden pulling on the lesser trochanter by the abductors muscles that are connected to the larger trochanter. This process is made worse by<sup>12</sup>, in addition to low bone quality and associated systemic problems. 10 Because this is a systemic problem, the way we treat these injuries has changed. If a patient is in good health prior to a fracture, that will determine the treatment and rehabilitation status that is most important. Physical inactivity may occur as a result of complications, the length of time it takes to repair a broken bone, or both. Stable fixation and anatomical reduction are necessary for an IT fracture treatment to result in early rehabilitation and fracture union.<sup>13</sup> distinct methods have been tested and found to be beneficial, including the use of trochanteric plates, absorbable ceramic based on calcium, osteotomies, and intramedullary implants.<sup>14</sup>

It is vital to match the implant type with the kind of fracture in order to facilitate early weight-bearing and union while protecting the fracture. When selecting a device, it can be helpful to classify fractures as either stable or unstable. It is recommended to use the Dynamic Hip Screw (DHS) as an implant for stable intertrochanteric fractures.<sup>15</sup>

We found excellent outcomes in 100 (52.6%) cases with HHS score  $92.6 \pm 1.8$ , good in 57 (30%) cases with HHS score  $86.2 \pm 4$ , 24 (12.2%) found fair with HHS score  $79.6 \pm 4$  and poor outcomes in 9 (4.7%) cases with HHS score  $35.8 \pm 7$ . When treating intertrochanteric fractures in the elderly with DHS, several local trials likewise found excellent to good functional outcomes. Citations.<sup>16,17</sup>

We employed a descriptive approach in our study. In a study conducted by Saarenpaa et al. (2011), 134 patients were evaluated for their effectiveness of DHS in preventing gamma nailing using the Standardized Audit of Hip Fractures in Europe (SAHFE) Hip Fracture Follow-up Forms. The DHS group showed less mortality and improved postoperative walking abilities compared to the gamma nailing group.<sup>18,19</sup>

Using the time-tested technique of DHS fixing, we exposed the fracture site after creating a big enough incision. In their analysis of 22,122 individuals, Lee and Huang discovered no statistically significant difference in the functional outcomes between conventional and minimally invasive procedures. A DHS 4-hole side plate was used in each of our cases. Because Wang<sup>20</sup> shown that a shorter (2-hole) side plate would impact the femur, plate pullout, and cortical screws, our results are consistent with his findings.

## CONCLUSION

Dynamic Hip Screw (DHS) implants are the gold standard for treating stable intertrochanteric fractures in older patients, and we

have seen great and good functional outcomes in the majority of our patients who have undergone this procedure.

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