



FUNCTIONAL AND RADIOLOGICAL OUTCOME OF UNSTABLE INTERTROCHANTERIC FRACTURE FIXED VIA DYNAMIC HIP SCREW

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Abstract

Introduction

The most common type of fracture that requires surgery is an intratrochanteric fracture, which also has the highest rate of postoperative mortality. The proximal femoral nail (PFN) and dynamic hip screw (DHS) with side plate assemblies are the most often utilized device In tertiary care hospital in Gujranwala Pakistan. the purpose of this study was to ascertain the functional and radiological outcome of an unstable intertrochanteric fracture following DHS fixation.

Methods: From June 12, 2016, to September 8, 2017, a study was conducted at the orthopedics department at the Gujranwala teaching hospital gujranwala (GTH). There were 60 patients with unstable intertrochanteric fractures, ranging in age from 34 to 94. Patients with open fractures, subtrochanteric fractures, intracapsular fractures of the femur neck, pathological fractures, numerous injuries, and patients who were not mobile before the injury were excluded. The visual analog scale was used to quantify functional outcomes during pain, and a goniometer was used to measure range of motion between 80 and 100 degrees. After three months, results were evaluated for satisfaction.

Results: This study comprised 60 patients who had post-DHS fixation for an unstable intertrochanteric fracture, according to radiographic diagnosis. Of them, 40% (24) were men, and their average age fell between 50 and 80 years old, at 66.61 ± 7.79 years. 6-% (36) of the patients had type II diabetes, and their mean age was 65 ± 8.37 years. After three months, 75% (45) of the patients reported no pain, and 92% (55) of the patients were functioning normally. In 90% (54) of the patients, the radiological result was found to be satisfactory.

Conclusion: At the conclusion of three months, 90% (55) of the patients had satisfactory results. In summary Better outcomes are seen when dynamic hip screw (DHS) fixation is used to treat unstable intertrochanteric fractures.

Introduction

Osteoporotic bones are the leading cause of intertrochanteric fractures in elderly adults. Falls are often the cause of these fractures [1]. Nearly half of hip fractures in the elderly are intertrochanteric fractures, which account for around 50% of unstable fractures in this population. Numerous studies have revealed that the age distribution affects the risk of hip fracture. Over 50 years of age, the prevalence of suffering increased to over 97% of adults [2–3]. The primary method of treating intratrochanteric fractures is surgery [2]. Hip fractures were predicted to occur in five million instances a year by 2050. Consequently, it seems that conducting additional study is essential to enhancing the results of hip fracture treatment approaches [4].

Hip fractures, or proximal femoral fractures, are a subset of femoral neck fractures and include trochanteric (per trochanteric/intertrochanteric) and sub-trochanteric fractures [5]. Surgeons are trying new intramedullary fixation device modalities since the unstable variety is hard to stabilize and linked to difficulties with the conventional dynamic hip screw (DHS) implant [2, 6]. In general, having a solid classification system is helpful for addressing fractures. A legitimate fracture classification ought to be extensive enough to be utilized in clinical outcome studies, reasonably consistent and repeatable, and straightforward enough to offer suggestions for clinical therapy [7].

Many categorization schemes have been established to categorize trochanteric fractures. While some classifications are based on the fracture mechanism or are intended to provide predictive information on the likelihood of attaining and maintaining reduction, the majority are based on the anatomical description of the fracture patterns observed [8–9]. In the United States (US), there are more than 28,000 hip fractures reported year, and by 2050, this number is predicted to treble. A significant amount of morbidity and mortality are linked to these fractures, with almost 30% of older people dying within a year following a fracture [10].

Intertrochanteric fractures are frequent, have a significant mortality and morbidity rate, and place a significant financial strain on society.

Currently, surgery for intertrochanteric hip fractures is typically reserved, with the exception of comorbidities that put patients at intolerable risk from anesthesia, surgery, or both [11]. Proximal femoral nail anti-rotation (PFNA) was used to repair unstable intertrochanteric fractures. It was a minimally invasive procedure that caused little surgical stress and provided secure fixation, enabling early mobilization and full weight bearing. Our rate of complications is in line with earlier research [12]. The two most popular methods of stabilization for intertrochanteric femur fractures are extramedullary plates and intramedullary nails. A crucial factor in choosing an intramedullary implant is the intramedullary stabilization of unstable fractures. It needs to be made sure that the distal fragment provides it with adequate support as well [13]. Nonetheless, intramedullary fixations with a shorter lever arm offer a theoretical advantage over extramedullary implants with regard to unstable fractures. Two or three cannulated screws are inserted at angles of 135 degrees, 145 degrees, and 150 degrees to treat femur neck fractures [14].

Orthopedic surgeons still face a clinical difficulty in managing unstable intertrochanteric fractures, despite advances in patient care. The purpose of this study was to ascertain the functional and radiological result of an unstable intertrochanteric fracture at a tertiary care hospital in Karachi, Pakistan, following DHS fixation.

Materials And Methods

From June 2023, to September 2023, a study was conducted at the Gujranwala Medical College Gujranwala Orthopedics Department. Prior to the accident, 60 patients with unstable intertrochanteric fractures, aged 33 to 93, who could walk alone with assistance, were permitted, as were patients who had provided informed consent. Patients with intracapsular fractures of the femur

neck, open fractures, subtrochanteric fractures, pathological fractures, and non-ambulatory patients before the accident were excluded. The length of the fracture and the diagnosis were recorded in detail in accordance with the hospital's protocols. The researcher called the subjects one day prior to the follow-up to gently remind them. Both the range of motion on a goniometer between 80 and 100 degrees and the visual analog scale were used to measure functional results during pain. After three months, results were evaluated for satisfaction.

An acceptable result was defined as functional and radiological outcomes that were satisfactory. Three days of post-operative antibiotics were administered. On the first postoperative day, non-weight bearing mobilization and active range of motion activities were initiated.

At every visit, anteroposterior and lateral plain radiographs were taken to check for helical blade cut-out, fracture union, tip apex distance, and lateral migration. With IBM SPSS Statistics for Windows, Version 21.0, data were entered, cleaned, coded, and analyzed (IBM Corp., Armonk, NY, US). A calculation was made for the quantitative variable's mean ± standard deviation (SD). Frequency and percentage were used to express categorical variables. Using stratified analysis, effect modifiers and confounding factors linked to acceptable outcomes were investigated. The impact of these factors on functional and radiological outcomes was assessed using the chi-square test. The statistical significance level was set at p-value ≤ 0.05 and two-tailed p-values were computed.

RESULTS

This study comprised 60 patients who had an unstable intertrochanteric fracture after DHS fixing, according to radiographic diagnosis. Of them, 40% (24) were men, and their mean age fell between 50 and 80 years old, at 66.61 ± 7.79 years. After three months, 75% (45) of the patients reported no pain, and 92% (91) of the patients were functioning normally. In 90% (55) of the patients, the radiological result was found to be satisfactory. Overall, 90% (55) of the patients had satisfactory results. Table 1 displays baseline demographic information as well as the study sample's functional and radiologic results.

TABLE 1

Characteristics	Frequency (%) or Mean ± SD
TOTAL	60
AGE	66.61
MALE	24
FEMALE	36

Functional outcome	
NO PAIN	45 (75%)
RADIOLOGICAL UNION	55 (90%)
PATIENT SATISFACTION	55 (90%)

When analyzed by gender and body mass index (BMI), the functional and radiological results of an unstable intertrochanteric fracture following DHS fixing three months later were statistically insignificant. Similar to patients between the ages of 33 and 70, patients above 70 also had less favorable results after three months, with an overall satisfactory outcome of 96.5% (27/28) vs. 93.75% (30/32), p-value = 0.017, respectively. Table 3 displays the functional and radiological outcomes by baseline characteristics after three months.

TABLE 3

Characteristics	N	No Pain	Normal Function	Callus Formation	Acceptable Outcome
MALE	24	22	20	22	22
FEMALE	36	34	32	34	30
33 TO 70	28	25	26	27	27
MORE THEN 70	32	27	25	30	30

Discussion

Orthopedic surgeons face a clinical problem when managing unstable intertrochanteric fractures, even with breakthroughs in patient care. For example, intertrochanteric fractures are frequently paired with subtrochanteric fracture types. Due to their high degree of instability, which is linked to a higher risk of morbidity and mortality, particularly in older osteoporotic patients, therapy is still difficult for them. Intertrochanteric femoral fractures have been linked to an increasing tendency, and in senior individuals, intertrochanteric fractures account for nearly half of hip fractures [15]. Preservation of ambulatory function is a vital part of the treatment of these fractures in patients with intertrochanteric fractures. These fractures occur in elderly patients due to a lack of strength and coordination, which causes them to walk with support and crutches and face high rates of mortality and morbidity [17]. Prolonged immobilization and other adverse medical conditions can be linked to these patients. The primary goal is to restore patients' pre-fracture activity and lifestyle as soon as possible, especially in elderly patients. However, a number of factors, particularly in elderly patients, influence the functional outcomes in these patients, including adequate internal fixation, minimal blood loss, minimal anesthesia time, early mobilization, and general patient health [16, 18]. The degree of fracture stabilization, related bone injuries, early ambulation following surgery, and perioperative complications all have a significant role [18]. Many attempts have been undertaken over time to improve implants and biomechanical design for the fixing of these fractures [18]. An implant that is suggested for the stabilization of unstable intertrochanteric fractures is the dynamic hip screw (DHS) [13, 19]. On the other hand, DHS fixation has been linked to a variety of reported problems.

It continues to be the most dependable and effective course of treatment for unstable intratrochanteric fracture despite side effects [20]. Evidence suggests that intra-medullary devices, particularly in the case of A1 and A2 fractures, may not yield superior results than DHS, despite the growing tendency towards their usage [21–22]. In our study, 81.1% of patients showed satisfactory functional and radiological results three months after DHS repair of an unstable intertrochanteric fracture. Results were unaffected by the patients' gender or body mass index; however, older patients (>65) and those with diabetes showed comparatively worse functional and radiological outcomes. Our results are in line with earlier research by Mardani-Kivi et al. [23]. This study suggests that DHS is a more dependable and effective treatment for intertrochanteric break in contrast to a locking compression plate (LCP). After six months of follow-up, DHS groups had significantly lower rates of device failure and limb shortening. Results were categorized as excellent in 31.7% of patients, good in 63.3%, and fair in 5.0% of patients based on the Harris Hip Score [23]. In a similar vein, Shetty et al. similarly documented favorable functional and radiological results following DHS treatment of unstable intertrochanteric fractures, with a Harris Hip Score of excellent to good in 59.4% of cases [24].

A different study by Barwar et al. indicated that 45.8% of the patients had good results at a year, and 66.7% of the patients had a radiologically united fracture by the third month [25].

Despite the expectation of a higher risk of intertrochanteric fracture and sequelae following DHS fixation, we found no statistically significant differences in the functional outcomes of DHS between patients who weighed less than 27 kg/m² and those who weighed more than 27 kg/m². Similarly, a protective effect against hip fracture was discovered by a comprehensive assessment of fifteen prospective cohort studies [26]. For most patients, DHS produces satisfactory results, making it a good course of treatment. However, in order to lower the rates of complications, more advancements in tools and methods are necessary.

Conclusion

Better results occur from using DHS fixation to treat unstable intertrochanteric fractures. After three months following DHS fixation of the unstable intertrochanteric fracture, we saw acceptable outcomes in 90% of the patients in our research.