

Treatment of Trochanteric Mass Fractures by Dynamic Screw-Plate (DHS) in the Orthopedic-Traumatology Department of the Donka National Hospital: 25 Cases

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Abstract

Objective: To evaluate the radiological and functional results of patients treated with dynamic screw plates (DHS) for trochanteric fractures in the Orthopedics-Traumatology Department of the Donka National Hospital. **Methodology:** This was a five (05)-year continuous retrospective study from January 1, 2019, to December 31, 2023. We used the Watson-Jones pathway without an image intensifier. Patients were evaluated according to the Postel-Merle D'Aubigné evaluation criteria. **Results:** A total of 25 trochanteric fractures were recorded. The patients were 16 men and 9 women, with a sex ratio of 1.77 and an average age of 63.5 years, with extremes of 31 and 96 years. The average fracture management time was 4.04 days. Etiologies were dominated by road traffic accidents (52.00%), followed by domestic accidents (falls) (44.00%). Merchants and housewives were the most affected (32.00%). According to the Ender classification, type III fractures (n = 15; 60.00%) were the most common, followed by type VII (n = 4; 16.00%). The procedure was performed 23 times (92.00%) under spinal anesthesia, 2 times (8.00%) under general anesthesia. The average hospital stay was 9.6 days. The mean operative time was 105.6 min, with extremes ranging from 90 to 120 min. The mean time to consolidation was 14.88 weeks, with extremes of twelve and twenty weeks. Comorbidities included hypertension and diabetes. The majority of patients (76.00%) had good anterior autonomy according to the Parker index. The mean index was 8.2 [standard deviation ± 1.8]. We noted three cases of post-operative death (12.00%). We evaluated nineteen patients with a mean follow-up of 24 months, and the functional results according to Postel and

Merle d'Aubigné scores were excellent in 42.10% (n = 8), good in 52.63% (n = 10), and fair in 5.2% (n = 1). **Conclusion:** The DHS dynamic screw-plate has enabled us to achieve good radiological and functional results, enabling us to resume daily activities as quickly as possible. It appears to be a reliable solution for trochanteric fractures. It can be performed without an image intensifier, provided we are aware of its limitations.

Keywords

Massive Trochanteric Fractures, Dynamic Plate Screw, Donka National Hospital

1. Introduction

Pertrochanteric fractures are proximal fractures of the femur, bounded at the top by the base of the neck and at the bottom by a horizontal line 2.5 cm from the lower edge of the lesser trochanter. They are very common in the elderly, due to osteoporosis and muscular atrophy, but can also occur in young people following violent trauma [1].

Trochanteric fractures represent a delayed surgical emergency, ideally requiring surgery within 48 hours. The frequency of these fractures will continue to increase as the population ages [1]. Osteosynthesis enables early management and social reintegration, with rapid resumption of activities of daily living. The indications for osteosynthesis depend on the type of fracture, the technical resources available and the surgeon's experience [2]. In sub-Saharan Africa, various implants are used to treat trochanteric fractures trochanteric fractures [3] [4]. The Dynamic Hip Screw (DHS) is one of the implants designed to treat these fractures. It is an open-focus, extra-medullary synthesis device. The aim of this study was to evaluate the radiological and functional results of dynamic screw-plate osteosynthesis of trochanteric fractures in the Orthopedic-Traumatology Department of the Donka National Hospital.

2. Methodology

This was a five (05) year continuous retrospective study from January 1, 2019 to December 31, 2023. All patients treated surgically and followed in the department during the study period were included. Patients treated orthopedically (fractures with little or no displacement) and/or with incomplete records were excluded from the study. Patient data were collected retrospectively from hospitalization registers, clinical files, operative and anesthesia report registers, telephone interviews, home visits with clinical examination, and follow-up consultations. Patients were informed of the objectives of the study. They were given the freedom to participate or not. Dignity, privacy and anonymity were respected according to the Helsinki recommendations.

All patients benefited from a preoperative assessment with X-rays of the pelvis and the diseased hip (front and profile). The real-size (100%) frontal X-ray of the pelvis allowed us to measure the length of the cephalic screw, the cervico-diaphyseal angle and choose the most appropriate implant.

3. Surgical Technique and Postoperative Follow-Up Protocol

The patient is positioned supine, on an ordinary table, under spinal anesthesia or general anesthesia, with a cushion under the buttock. We used the Watson-Jones approach. Reductions are performed using two pins (one for cervical anteversion, the other for the guide pin). All the DHS used in our series had an angulation of 135° with a diameter of 11 mm. The quality of the osteosynthesis was judged on the position of the cervical screw in the head, on front and side views, considering that the best position was inferior from the front and medial from the side, supporting the primary compression trabeculae. Systematic aspirated drainage was performed for 48 to 72 hours. Antibiotic prophylaxis was systematic. Post-operative thromboembolic prophylaxis was applied for six weeks. Dressings were applied twice weekly. Sutures were removed between the 18th and 21st postoperative days. At the end of the procedure, knee flexion and hip flexion are used to test the strength of the assembly.

Physiotherapy began the day after the operation. The session began with exercises in bed: activating circulation with gentle knee movements to counter flexion, isometric contractions of the quadriceps and ankle flexor and extensor muscles. The next day, the first thing to do is learn to walk without a load. Walking distance gradually increases over the following days (**Figure 1**).

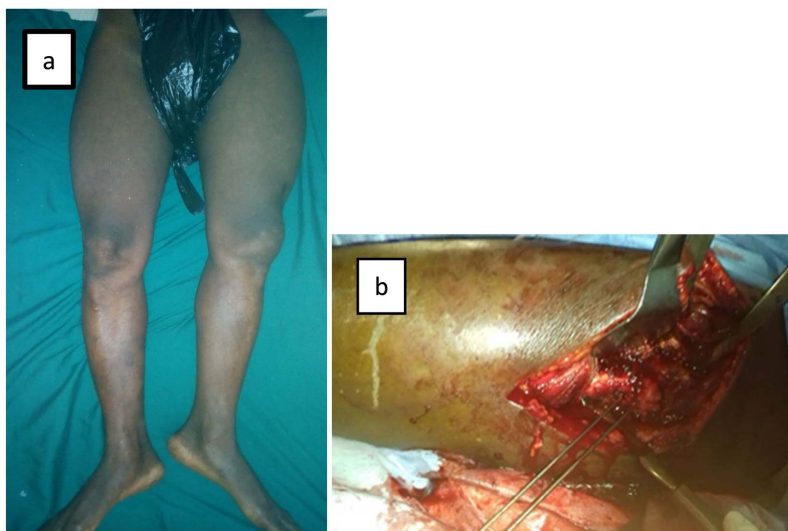


Figure 1. (a) Clinical image showing a 47-year-old merchant patient victim of a road traffic accident (motorcycle); (b) The Watson-Jones approach.

Analysis method: Each patient benefited from a protocolized follow-up with a systematic consultation at D45 and D120, including a radiographic assessment

(face and profile) of the hip, to assess the consolidation of the fracture, the functional result and any complications. The data were entered into Excel software. We evaluated our patients according to the Postel-Merle D'Aubigné numerical rating of hip function [5]. The parameters evaluated (pain, mobility and walking) are rated from 0 to 6 then added and the results are quantified as continuation:

Excellent: (17 - 18 points); Good: (13 - 16 points); Means: (8 - 12 points); Bad: (0 - 7 points).

Limits and difficulties: During the study period, the Orthopedics-Traumatology department of the Donka National Hospital was relocated to Camp Camayenne (a military camp located opposite the hospital) for reasons of renovation and extension of the hospital. This reduced the attendance rate. The quality of certain medical documents was degraded, which forced us to eliminate these files from the study.

4. Results

Our patients ranged in age from 31 to 96 years, with a mean age of 63.5 years. There were 16 men (64%) and 9 women (36%), with a sex ratio of 1.77. Comorbidities were represented by hypertension and diabetes. Aetiologies were dominated by road traffic accidents (52.00%), followed by domestic accidents (falls) (44.00%). By socio-professional category: merchants and housewives were the most affected (32.00%), followed by blue-collar workers (12.00%), (32.00%), civil servants (8.00%), farmers (8.00%) and motorcycle-taxi drivers (8.00%).

According to Ender's classification, type III fractures (n = 15; 60.00%) were the most common, followed by type VII (n = 4; 16.00%), type VIII (n = 3; 12.00%), type VI (n = 2; 8.00%), and type IV (n = 1; 4.00%).

Of our 25 patients, 19 (76%) had an isolated hip injury and six (24%) had an associated injury (**Table 1**).

Table 1. Associated lesions.

Lesions	Workforce	%
Fracture of the femur	3	12.00
Fracture of the humerus	3	12.00
Fracture tibial Plateau	1	4.00
Open fracture of both leg bones	1	4.00
Bimalleolar Fracture	1	4.00

The average fracture management time was 4.04 days. The procedure was performed 23 times (92.00%) under spinal anaesthesia and 2 times (8.00%) under general anaesthesia. The mean operative time was 105.6 min, with extremes ranging from 90 to 120 min. Reduction was satisfactory in 80% of cases, with the DHS screw in the correct position in 60% of cases. The mean time to consolidation was 14.88 weeks, with extremes of twelve and twenty weeks (**Figure 2**).

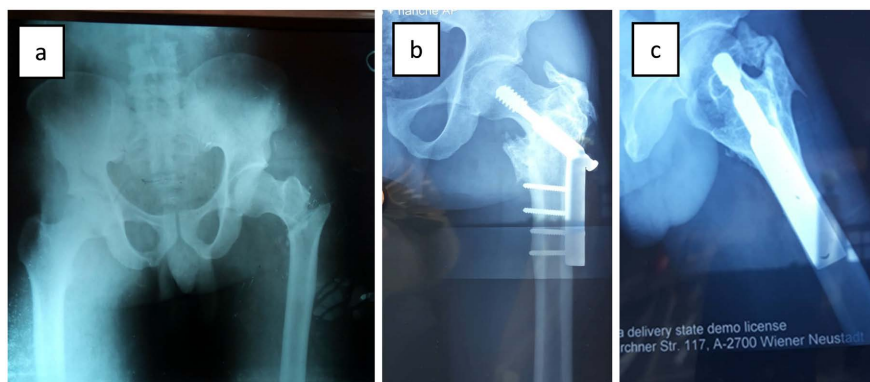


Figure 2. (a) Pertrochanteric fracture, ender type III; (b) and (c) Consolidation after DHS osteosynthesis.

The average hospital stay was 9.6 days. The majority of patients (76.00%) had good prior autonomy according to the Parker index. The mean index was 8.2 [standard deviation ± 1.8]. No in-hospital deaths were recorded.

During the course of the operation, we noted three cases of death (12.00%): Two 72-year-old patients with hypertension died at nine months and three years post-operatively; A 75-year-old patient with hypertension and diabetes died nine months postoperatively.

We evaluated nineteen patients with a mean follow-up of 24 months, and the functional results according to Postel and Merle d'Aubigné scores were excellent in 42.10% ($n = 8$), good in 52.63% ($n = 10$), and fair in 5.2% ($n = 1$) (**Table 2**).

Table 2. Distribution of patients according to outcome assessment (Postel Merle d'Aubigné score).

Score	Workforce	Percentage (%)
Excellent	8	42.10
Good	10	52.63
Fair	1	5.20
Total	19	100.00

5. Discussion

Trochanteric fractures are the most common, accounting for 65% of proximal femur fractures [6], and the mean age in our series is a relatively young 63 years. The predominance of males in our series (64%), with a sex ratio of 1.77, is not the most common finding in the literature, where females are often dominant. The patient is often elderly, female and osteoporotic [7]. This may be explained by the low life expectancy of our population and the young working population. Fractures of the upper extremity of the femur occur most frequently in subjects with tares. In our series, associated tares are present at a rate comparable to that of foreign series [8]. The mean operating time in our study was 4.04 days [standard

deviation ± 8.5], with extremes of 1 and 15 days. This result is comparable to that of several African series [9] [10]. These operating times contrast with the European series, where the tendency is to perform surgery for fractures of the upper end of the femur within 48 hours of patient admission [11]-[13]. The mean operating time in our series was 105.6 min [90 - 120]. The majority of patients (73.9%) were transfused with one or two units of iso-group iso-rhesus blood during the procedure. These results may be explained by the “open” approach and the absence of an orthopedic table. Similar issues have been raised by Rabemazava AA *et al.* [9] which had an average surgical intervention time of 90 min. Regarding the quality of reduction, a 2016 study in Burundi on the treatment of trochanteric mass fractures by DHS reported that the quality of reduction was satisfactory in 90% of cases, with DHS screws in a good position in 78% of cases [14]. This is in line with our study, in which 80.00% of trochanteric fractures were anatomically reduced. These good results could be explained by the type of stable fracture and the prior reduction of the fracture. In our series, the mean time to consolidation was 14.88 weeks, with extremes of twelve and twenty weeks. This is similar to that reported by Ndayizeye J.C *et al.* [15] which found a mean time to consolidation of 15 weeks and a recoil of at least six months. The fracture was consolidated in 81.2% (26 cases). In our series, the average hospital stay was 9.6 days. With the gamma nail, however, the average hospital stay was reduced thanks to early patient management [8].

Regarding complications, according to the literature, more than half of patients undergoing hip fracture surgery will experience postoperative complications, mainly of a medical nature [16]. The complication rate is influenced by the time between trauma and surgery, but to a variable extent [6]. Another study conducted by Saul D. *et al.* in 2019 [17] concluded that the delay in treatment had no direct impact on post-operative complications. In our series, during the course of the operation, we noted three cases of death (12.00%), essentially related to associated defects (hypertension + diabetes); three patients aged 72 and 75 at nine months and one patient aged 75 at three years postoperatively. This could be explained by the various precautions taken pre- and postoperatively: systematic antibiotic prophylaxis, anticoagulant, blood transfusion, initial management of associated pathologies before surgery and early lifting with walkers. Functional recovery is significant, and depends on a number of factors. Only 20 - 60% of survivors regain their initial level of autonomy within a year. After one year, in an initially autonomous population, 40% were walking without assistance, 25% with a cane, 25% with a walker and 10% were no longer walking [6].

6. Conclusion

The DHS dynamic screw-plate has enabled us to achieve good radiological and functional results, enabling us to resume daily activities as quickly as possible. It appears to be a reliable solution for trochanteric fractures. It can be performed without an image intensifier, provided we are aware of its limitations.

Authors Contribution

All authors have contributed to the clinical study and preparation of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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