SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://www.saspublishers.com

OPEN ACCESS

Orthopedics-Traumatology

Epidemiological and Therapeutic Aspects of Trochanteric Fractures at Kati University Hospital

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DOI: https://doi.org/10.36347/sasjs.2026.v12i05.007 | **Received:** 11.03.2026 | **Accepted:** 28.04.2026 | **Published:** 05.05.2026

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Abstract **Original Research Article**

The aim of this study was to determine the epidemiological profile and therapeutic aspects of trochanteric fractures in the Orthopedics-Traumatology department of Kati University Hospital. This was a retrospective study of 89 patient files treated between January 2019 and December 2023. Trochanteric fractures accounted for 64.28% of proximal femur fractures, mainly affecting men (sex ratio: 1.28) with a mean age of 62.15 ± 15.80 years. Good pre-fracture autonomy (Parker score >6) was present in 80% of patients. The right side was the most affected. Domestic accidents were the main etiology (68.5%). Type I and VII fractures according to Ender were the most common (30.3% and 21.4%). Surgical treatment with Dynamic Hip Screw-plate was the most performed (39.3%) followed by the 95° Blade-plate (30.3%) and the Gamma nail (15.7%). The complications included infections (5.6%), pressure ulcers (2.2%), implant failures (3.4%), cervical screw back-outs (5.6%), and femoral head necrosis (2.2%). Functional outcomes, evaluated according to the Merle d'Aubigné and Postel scoring system, were satisfactory (excellent, very good, and good) in 88.7% of cases. Rapid and multidisciplinary management seems essential to improve the prognosis and functional outcomes of trochanteric fractures.

Keywords: Trochanteric, Fractures, osteosynthesis.

INTRODUCTION

Trochanteric Fractures are breaks in continuity of the trochanteric region, bounded supriorly by a the base of the femoral neck and inferiorly by a horizontal line 2.5 cm below the inferior borber of trochanter minor [1]. This is the most common fracture of proximal femur, representing 65% of such fractures [2]. They occur particularly in two epidemiological categories of patients: elderly (female) individuals with minor trauma on osteoporotic bone, and young individuals following a high-energy trauma [2-5]. It is a major public health problem [6-10]. In Mali, trochanteric fractures represented 77.24% of proximal femur fractures in a study conducted at the University Hospital of "Luxembourg" [2].

Diagnosis of these fractures is easy, but therapeutic management is most often difficult in our conditions. In principle, management is surgical, allowing early mobilization and weight-bearing in order to promote a rapid social reintegration [11]. These fractures can compromise the vital prognosis in elderly subjects due to comorbidities and complications from bed rest, and the functional prognosis in young subjects due to late complications. They constitute one of the main causes of hospitalization in our department. It is in view of this high frequency and the importance of their often complex management that we initiated this study, the aim of which was to determine the epidemiological profile and therapeutic aspects.

MATERIAL AND METHODS

This was a single-center, descriptive study with retrospective data collection. It took place from January 2019 to December 2023. Patients treated at the Pr BSS University Hospital in Kati for trochanteric fractures and followed for at least 12 months were included. Incomplete files and patients lost to follow-up were excluded. Data were processed using SPSS software. We collected socio-epidemiological, therapeutic, and outcome data. Patients age was categorized according to the WHO classification [12]. The degree of autonomy before trauma was assessed according to the Parker score [13]. Fracture types were classified according to Ender

[14]. Functional assessment was performed using to the Postel Merle Aubigné (PMA) score [15].

Ethical considerations: This study was conducted in accordance with the good clinical practice protocol and the principles of the Declaration of Helsinki. The investigators ensured total anonymity of the information obtained during the study. All collected information was used only for scientific purposes.

Figure 1: Left Femur Fracture Ender -Type VIII

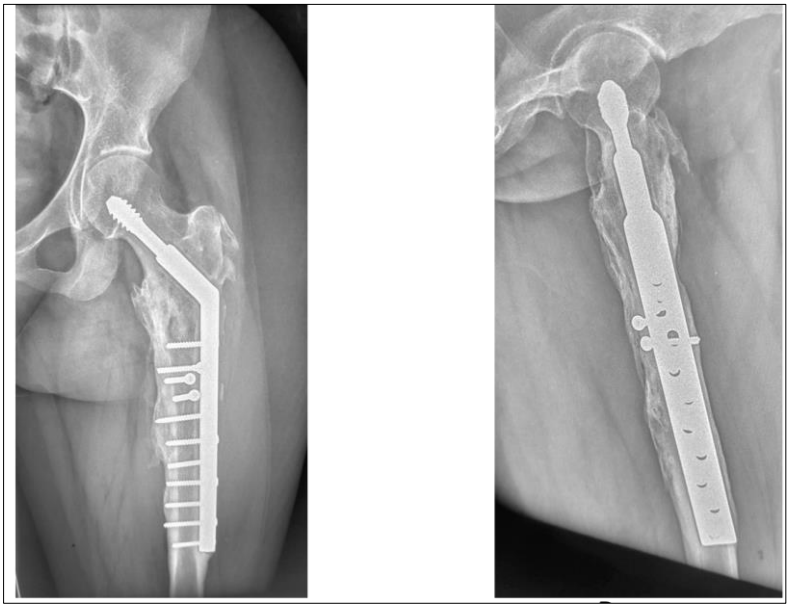

Figure 2: Bone union after Dynamic Hip Screw Plate fixation

RESULTS

During the study period, 168 fractures of the proximal femur were recorded, among which 108 involved the trochanteric region, representing a frequency of 64.3%. Fifty men (56.18%) and thirty-nine women (43.82%) were included, with a mean age of 62.15±15.8 years (ranging from 13 to 92 years). The age group 60 to 74 years was the most affected, with 42.7%. Fractures affected patients under 75 years of age in 76.4% of cases and the eldery (age age ≥ 75 years) in 23.6% of cases. Personal medical history was present in 44.9% of patients. These included hypertension (22.5%), diabetes (9%), diabetes associated with hypertension (7.9%), asthma (2.2%), visual disorders (2.2%), and HIV (1.1%). Eighty percent (80%) of patients were independent before the trauma (Parker score > 6). The circumstance of the injury was a domestic accident (falls) in 68.5%, and the fracture was located on the right side in 53.9%. Simple pertrochanteric fractures (type I) and subtrochanteric fractures with metaphyseal or diaphyseal extension (type VII and VIII) were predominant (Table I). In our study, 22.5% of patients had undertaken traditional treatment before admission to our department.

Table I: Fracture Characteristics

Characteristics	Number	Percentage
Side affected		
Right	48	53.9
Left	41	46.1
Etiology		
Domestic accident	61	68.5
Road traffic accident	23	25.8
Workplace accident	04	4.5
Pathological fracture	01	1.1
Fracture type (ENDER)		
I	27	30.3
II	10	11.2
III	07	7.9
IV	01	1.1
V	03	3.4
VI	13	14.6
VII	19	21.4
VIII	09	10.1
Associated Injuries		
None	80	89.9
Other fracture	08	09.0
Traumatic brain injury	01	01.1

The average time to admission was 7.62±28.4 hours, with 78.6% of our patients being admitted on the same day of trauma and 21.3% after 24 hours. The waiting treatment included adhesive traction 40.8%, transosseous traction 16.9%, and the anti-rotational foot plaster 29.2%. The anterolateral (Watson-Jones) approach was the most used at 78.7% (n=70) followed by the minimally invasive lateral approach (18%). Moore and Hardinge approaches were used in 2.2% and 1.1% of cases, respectively. In our series, osteosynthesis with Dynamic Hip Screw-plate was the most performed with 36 cases (40.4%); followed by the 95° blade-plate with 27 cases (30.3%), and the Gamma nail with 14 cases (15.7%) (Table II). The average hospital stay was 6.25±3.1 days, with extremes of 3 and 11 days. Secondary complications included skin infection (5cases, 5.6%) ; pressure ulcers (2cases, 2.2%) ; cervical screw back-out (5cases, 5.6%) ; implant failure (3cases, 3.4%) and implant removal (1case, 1.1%). Nonunion (2.2%) and femoral head necrosis (2.2%) were the late complications noted. Bone-union was achieved in 85 cases (95.5%) in less than 4 months. In our study, the PMA score was excellent in 15.7%, good in 73.0%, fair in 10.1%, and poor in 1.1% of cases.

Table II: Distribution by type of implant used:

Implant	Number	Percentage
Dynamic Hip Screw plate	36	40.4
95° Plate blade	27	30.3
Gamma nail	14	15.7
135° Plate blade	5	5.6
Total Hip Arthroplasty	2	2.2
Plaque en crochet	2	2.2
Proximal Femoral Nail antirotation	1	1.1
Partial Hip Arthroplasty	1	1.1
Dynamic Condylar Screw Plate	1	1.1
Total	89	100.0

Figure III: Left Femur Fracture Ender -Type III

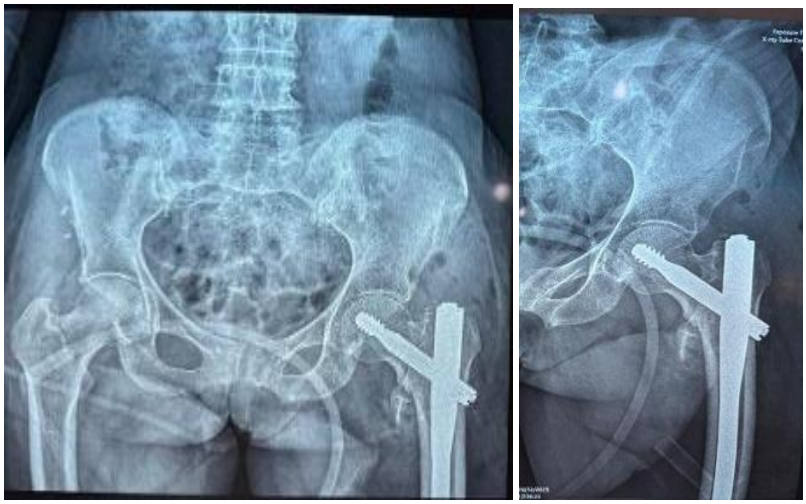

Figure IV: Gamma Nail Fixation

COMMENTS AND DISCUSSION

Trochanteric fractures are common traumatic injuries [3,5]. In our study, they represented 64.3% of proximal femur fractures. This same observation has been reported by several authors [2,9,16]. We found a male predominance with a mean age of 62.1±15.8 years. Subjects under 75 years of age were the majority (76.4%). J Boukris *et al.,*[5] and Traoré T *et al.,*[17] made the same observation. Nevertheless, several authors have reported a female predominance with patients over 75 years of age [3,9,18]. This observation clearly illustrates the role of the socioeconomic and demographic context in the observed trauma profile. Domestic accidents (falls) were the main circumstances of occurrence, accounting for 68.5% of cases. This type of accident has been mentioned in several studies [5,7,17-21]. However, this study found a significant proportion of road traffic accidents (25.8%). Simple pertrochanteric fractures (Type I) were predominant (30.3%). They represented 55.4% and 67.3% respectively in the series by Traoré T [17] and Siniki F [4]. Our series, composed of relatively young patients who were most often victims of violent trauma, could explain the frequency of unstable fractures (Type VI, VII, and VIII).

The Dynamic Hip Screw - plate and the 95° plate-blade were the most commonly used types of implants. Intramedullary Nailing was performed in only 15.7% of cases. Sylla D [22] and Touré L [2] used the Gamma nail in 34.16% and 52.2% of cases, respectively. Intramedullary nailing is currently the treatment of choice [2-5,18,20]. However, its low rate of implementation in our series could be explained by its unavailability for most of the study period. Hip arthroplasty is often indicated because it allows for rapid restoration of autonomy and prevention of bed rest complications. It was performed in 3 cases. The average length of hospital stay was 6.2±3.1 days, ranging from 3 to 11 days. This duration is shorter than that reported by Elis [23] in Israel and Wast D [24] in France, who respectively reported duration of 10.8 and 8.8 days, respectively. In our context, the length of hospital stay depends on the patient's general condition, the evolution of the surgical wound, and the occurrence of complications. The main postoperative complication noted was infection in 5.6% of cases. Targeted antibiotic

therapy was required. This infection rate remains high. However, it is lower than that reported by Touré L *et al.,*[2], who found 17.69%. This study did not find any cases of thromboembolic disease or perioperative death. Some authors have reported high mortality rates [2,18,21-23]. This necessitates multidisciplinary management of the perioperative period. Despite the spongy structure and rich vascularization of the trochanteric region, its fractures can be subject to mechanical complications. In our study, nonunion (2.2%), cephalic necrosis (2.2%) cervical screw back-out (5.6%), implant failure (3.4%) and implant removal (1.1%) were noted. In the literature, all these complications have been reported in varying proportions depending on the study [2,3,25]. M. Barla et al [3] observed a significant link between poor reduction and the occurrence of mechanical complications. The mean bone-union time in our series was 117.9 days. This is longer than that of Touré L [2] and Sylla D [22], who found mean bone-union times of 99.3 days and 97.7 days, respectively. The frequency of unstable fractures most often involving the subtrochanteric region, the predominance of the open reduction and internal fixation by extramedullary implants, and the practice of traditional treatment as first-line are all factors that could influence bone-union and functional outcome. Indeed, functional scores seem higher in cases of closed reduction and internal fixation using intramedullary implants [2-5]. In our series, the PMA score was excellent and good in 88.7% of cases. However, our result is higher than those of Bouarda [9] and Vallean RD [25] who observed the same assessment in 77.2% and 54.84% of patients, respectively. These differences in results could be related to management methods.

Conclusion

Trochanteric fractures remain a common traumatic injury. They affect a relatively young population in our context, with a predominance of males. Management is multidisciplinary due to the prevalence of comorbidities and the frequent occurrence of complications. The main objective is to restore previous function and autonomy to the patients and to prevent complications. Nowadays, the treatment of these fractures is exclusively surgical. Osteosynthesis appears to give good results with a significant proportion of mechanical complications.

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