

Epidemiological, Clinical, and Therapeutic Study of Limb Fractures Involving Motorcycle Taxis (Telimani) at the Orthopedics and Traumatology Department of Gabriel Toure University Hospital

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Abstract

Original Research Article

Introduction: Motorcycle accidents are unforeseen events that occur suddenly and violently, causing visible injury and involving a motorized two- or three-wheeled vehicle on a public road. This study evaluated the epidemiological, clinical, and therapeutic aspects of limb fractures involving motorcycle taxis at the Gabriel-Touré University Hospital in Bamako, Mali. **Patients and methods:** This was a prospective, descriptive study conducted over an 8-month period from November 1, 2023, to June 30, 2024. **Results:** Limb fractures resulting from motorcycle taxi accidents accounted for 8.60% of all fractures. Males were predominantly affected (71.2%; sex ratio: 1.26), with the 21–30 age group (29.8%) being the most affected. Motorcycle-to-motorcycle (29.8%) and motorcycle-to-car (25%) collisions were the most frequent. Only 26.9% of drivers were wearing helmets. The lower limb was the most frequently affected site (34.6% involving the leg), with 64.4% closed fractures and 35.6% open fractures (predominantly Gustilo-Anderson type I at 44.4%). Surgical treatment was the primary approach (76.9%), with screw-and-plate fixation being the most common method (31.8%). The outcome was favorable in 87.5% of cases, with few complications. **Conclusion:** Limb fractures involving motorcycle taxis represent a major public health issue in Bamako. This injury-related morbidity is the leading cause of admission to medical-surgical emergency departments.

Keywords: Limb fractures, Motorcycle taxis, Complications, Bamako.

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INTRODUCTION

A fracture is defined as a break in the continuity of a bone. It can range from a simple crack to a comminuted fracture [1].

A road traffic accident (RTA) is defined as an event involving at least one vehicle, occurring on a road or street open to public traffic, and resulting in property damage and/or personal injury [2].

With 1.35 million fatalities annually, road accidents are now the eighth leading cause of death overall and the leading cause of death among individuals aged 5 to 29 [3]. Motorcyclists are among the most frequent victims and are particularly vulnerable due to the design of their vehicles; they lack a protective body, seatbelts, or airbags [4].

In Mali, road accidents involving two-wheeled vehicles constitute a major public health issue, particularly due to the explosion in the number of such vehicles. The introduction of these two-wheeled vehicles as a means of urban transport is a phenomenon that has emerged in Mali over the past five years; while it has helped to partially address the problem of youth unemployment, it has also exacerbated the issue of road accidents [5].

Fracture management involves either surgical or orthopedic treatment aimed at ensuring healing as quickly as possible and without complications.

The time required for healing depends on the fracture site and type, the patient's age and general health, and the chosen method of stabilization [6].

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The aim of our study was to evaluate the epidemiological, clinical, and therapeutic characteristics of limb fractures involving motorcycle taxis, as seen in the Traumatology and Orthopedics Department of the Gabriel Touré University Hospital.

PATIENTS AND METHODS

We conducted a prospective, descriptive study over an 8-month period, from November 1, 2023, to June 30, 2024.

The study included all patients who sustained a fracture of a previously healthy limb in a motorcycle-taxi-related incident within a maximum of three weeks prior to presentation, and who were treated and followed up in the Traumatology and Orthopedics Department of CHU GT during the study period.

Sampling was exhaustive, including all motorcycle accident victims treated and followed up in the department. We analyzed patient variables regarding epidemiology (frequency, age, sex, occupation, use of protective helmets, circumstances of the accident),

clinical and anatomical features (injury characteristics and associated injuries), and treatment (surgical techniques, duration of intervention, and clinical course).

RESULTS

Our study identified 104 cases of limb fractures involving motorcycle taxis out of a total of 1,209 limb fracture cases treated in the department during the study period, representing 8.60%.

Men were the most affected group (71.2%), with a sex ratio of 2.4. The 21–30 age group was the most affected (29.80%), with an age range of 5 to 72 years.

Motorcycle-to-motorcycle collisions were the most frequent type of accident (29.8%), followed by motorcycle-to-car collisions (25.0%) and motorcycle skidding incidents (23.1%).

The left side was affected in 53 cases (51.0%). The use of safety helmets was infrequent during the study; 26.9% of drivers wore a helmet.

Table 1: Sociodemographic data

Variables	Number	Pourcentage (%)
Age	[21-30] years extreme 20 and 66 years	29,80
Sex		
M	74	71,2
F	30	28,8
Mécanismes		
Motorcycle- Motorcycle	31	39,8
Motorcycle -auto	26	25
Moto-Skidding	24	23,1
Pedestrian- Motorcycle	14	13,5
Motorcycle -tricycle	7	6,7
Other	2	1,9
Side affected		
D	51	49
G	53	51
Helmet wearing		
Yes	28	26,9
No	76	73,1

M: Male F: Female R: Right L: Left

Motorcycle taxi drivers were the most affected, accounting for 45.2% of cases.

The fracture was closed in 64.4% of cases and open in 35.6% (37 cases).

The lower limb was much more frequently affected, particularly the leg segment, with a frequency of 34.6% (36 cases).

Table II: Distribution of patients by segment

Limb Segment	Number	Pourcentage (%)
Thoracic limb	17	16,2
Pelvic limb	87	83,8

Surgery was indicated in 76.9% of cases (n = 80).

Traumatic wounds were the most frequent associated injury (14.4%, n = 15), followed by polytrauma (9.6%, n = 10).

The most commonly used implant was the screw-fixed plate (31.8%, or 33 out of 104 patients).

Table III: Distribution by complications

Complication	Effectifs	Pourcentage (%)
No complication	73	70,2
Cutaneous-muscular injury	22	21,2
Infections/osteosynthesis matériels	6	5,7
Vascular-nerve injury	1	1,0
Delayed union	2	1,9
Total	104	100,0

L'évolution était favorable dans 87,5% des cas.

Table IV: Répartition selon l'évolution

Outcome	Number	Pourcentage (%)
Favorable	91	87,5
Unfavorable	13	12,5
Total	104	100,0

DISCUSSION

During the study period, we included 104 patients out of a total of 339 admitted to the department following a road traffic accident involving a motorcycle taxi, representing 30.67% of cases.

Road traffic accidents involving motorcycle taxis are therefore a frequent reason for admission to our department. This alarming proportion stems from a combination of several factors.

The last decade has seen a massive influx of motorized two-wheelers used for transport, and they now constitute the primary mode of travel. These vehicles are affordable, making them accessible to a significant segment of the population.

Although most riders hold a driver's license, accidents are caused by a lack of technical mastery of the vehicles, ignorance of and failure to observe traffic laws, and the poor condition of public roads. Other authors have also reported the increasing involvement of motorcycle taxis in road traffic accidents.

In Mali, Elmoctar [7] reported a frequency of 65.3%; in Cameroon, Hogna *et al.*, found a frequency of 56% [8]; and in Benin, Dedewanou L. and Yanogo P.K. found a frequency of 61.27% [9].

Males predominated in our series, accounting for 71.2% of cases, representing a sex ratio of 2.4. Several authors have reported this predominance; it is attributed to the disparity in numbers between male and female drivers and to men's bolder driving behavior. The high accident rate among men may also be explained by the fact that the motorcycle taxi profession in Mali is generally practiced by men.

This male predominance is consistently observed in studies conducted by Coulibaly K. [7] (87.62%), Aurélie Moskal [10] (74%), and Diango D. [11] (81%).

Our study reveals that the most affected age group was the 21–30 range (31.58%), with extremes of 10 and 72 years. This predominance may be attributed to the high mobility of this age group. Currently in our country—and particularly in Bamako—motorcycle taxis are the primary mode of transport. Consequently, this is a very young population that often fails to appreciate the risks associated with speeding and the failure to observe—or even ignorance of—traffic regulations. Age groups reported in the literature vary by author: Gnamkey K.M.W. [5] reported 31.70% in the 20–30 range, while Sangaré K. [12] reported 44.90% in the 15–29 range.

The fractures were closed in 64.4% of cases and open in 35.6%; the leg was the most frequently affected body segment, accounting for 43.3% of cases.

This could be explained by the fact that this part of the body is highly exposed to trauma.

The lower limb was the most frequently fractured site (80.8%), compared to the upper limb (19.4%). This predominance of lower-limb injuries was also reported by Ibrahima F *et al.*, (56.7% vs. 39.9%) [13].

This finding may be explained by the fact that these areas of the body are relatively exposed to impacts, even minor ones.

The fractures were closed in 64.4% of cases. This figure is lower than that reported by Da SC *et al.*, who found a 77% rate of closed fractures [10]. Fractures of the tibia and fibula were the most common, accounting for 20.2% of the study population. This result aligns with the findings of Camara M, who reported a rate of 45.95% [14].

This can be attributed to the fact that the lower leg lacks protection and is therefore exposed to trauma.

Surgical treatment was performed in 76.9% of cases. This result differs from that of Da SC *et al.*, who found that orthopedic treatment was the most common approach, accounting for 83.5% of cases [15].

This discrepancy could be attributed to the fact that most of these fractures met the criteria for surgical intervention (e.g., open fractures, intra-articular fractures, or fractures that could not be reduced orthopedically), as well as the difficulty patients faced in covering the cost of surgical kits—a factor also noted in the study by Da SC *et al.*

The complications recorded were as follows:

Skin perforation accounted for 21.2% of immediate complications. This result differs from that of Camara M [14], who reported a figure of 18.92%. This may be explained by the severity of the trauma resulting from speeding and the motorcycle taxi drivers' lack of control over their vehicles.

Infections associated with osteosynthesis hardware accounted for 5.7% of secondary complications. This could be attributed to:

- ✓ poor aseptic conditions in operating rooms and post-operative wards,
- ✓ delayed management in certain cases.

Delayed union accounted for 1.9% of late complications. This may be attributed to the open reduction of surgically treated fractures—resulting in the loss of the fracture hematoma—and the comminuted nature of some of the fractures encountered.

Rehabilitation was documented in 75.0% of cases.

All patients underwent functional rehabilitation, thanks to collaboration between the trauma unit and the physiotherapy department.

Outcomes for treated patients were good in 87.3% of cases. This is attributable to effective patient management, resulting from appropriate treatment indications and close monitoring throughout the course of treatment.

CONCLUSION

Limb fractures involving motorcycle taxis are a common reason for medical consultation. Motorcycle accidents pose a major public health challenge in Mali, resulting in extremely severe injuries. Prompt management of accident victims is essential to minimize complications that could compromise functional outcomes or even threaten survival. Continued efforts are needed to encourage the population to comply with traffic regulations.

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