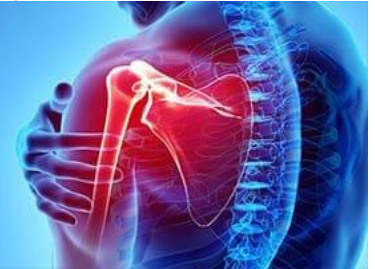


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## Results of the treatment of leg fractures due to road traffic accidents (ACR) at Owendo University Hospital

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### Abstract

Road Traffic Accidents (RCAs) have been heavily implicated in the occurrence of leg fractures, especially in low-income countries due to poor road conditions. The purpose of carrying out the treatments of leg fractures due to road traffic accidents and presenting the results of the treatment.

This was a prospective study, over a period of 11 months from January 1, to November 1, 2022 at the Owendo University Hospital Center (CHUO). Patients presenting to the trauma emergency department of the CHUO for a leg fracture after ACR were included. Patients consulting for leg fracture due to another cause were not included. Data were entered using Excel 2019 software. Statistical analysis was performed using SPSS version 24 software.

The results show that 64 patients made up of 39 men and 25 women took part in the study, with an M/F ratio: 1.56 in favor of men. The age group of 25 to 64 years was the most represented (75%) with an average age of 34 years and extremes of 6 to 63 years. The majority of patients had performed an X-ray and biological examinations (88%). Surgical treatment was the most used (64.1%) represented by ECM (34.34%). Orthopedic treatment was used in 35% of cases, represented by cruro-pedial plaster (91.3%). The suites were complicated in 29.6% of cases, most represented by osteitis (16%). The majority of patients had no complications after treatment (70%). The treatment was favorable in 91% of patients. Patients with a Cauchoix type 1 opening had a significantly unfavorable outcome.

Ultimately, leg fractures by ACR constitute a frequent reason for consultation in traumatological emergencies. This study revealed that patients with immediate and medium-term complications were most likely to have an unfavorable outcome.

**Keywords:** Road traffic accidents, leg fracture, treatments for leg fractures

### Introduction

Traumatology in Africa and in the world is dominated by fractures with a prerogative pushed for those of the extremities of the limbs <sup>[1, 2]</sup>. Leg fractures are solutions of continuity of the diaphysis of the tibia and/or the fibula. They are included between an imaginary horizontal line passing immediately below the anterior tibial tuberosity, under an imaginary line passing horizontally a few centimeters above the tibiotarsal joint <sup>[3]</sup>.

With 15 to 20% of all fractures according to Merle d'Aubigné <sup>[4]</sup>, leg fractures are the most frequent of the lower limb in France. The exact incidence of road traffic accidents responsible for leg fractures is difficult to obtain, but some details allow us to have a projection on it. About 30-86% of trauma received in hospitals in Africa is due to RTAs, with Côte d'Ivoire and Nigeria holding the records <sup>[5]</sup>.

Road traffic accidents have been reported as a cause of these fractures especially in low-income countries <sup>[6]</sup>. The damage caused is physical, social and financial, harming the victims, their families, the insurance companies and the government <sup>[7]</sup>.

These fractures predominate in young adults in full activity and constitute a traumatological emergency especially when the fracture is displaced with a cutaneous opening or a threat of opening. The prognosis is thus linked both to the lesional assessment and to the iatrogenic complications of an inappropriate treatment.

According to the WHO, throughout the world, ACRs have been heavily implicated in the occurrence of leg fractures, especially in low-income countries because of poor road conditions <sup>[6]</sup>. In Gabon, few studies concern leg fractures in relation to ACR, the incidence

is not known. Given the frequency of this pathology and given the importance of its management in the emergency room, we were motivated to study this subject.

## Material and methods

### Study framework

We carried out our study at the CHUO located in the town of Owendo south of Libreville, in the Akournam II district. The CHUO was inaugurated on July 8, 2016 by the presidential couple, with the aim of having a specialized and even hyper-specialized unit in orthopaedics-traumatology for a specialized management of all these pathologies referring to it as well as the maxillofacial.

### Type of study

We carried out a prospective, descriptive, analytical, single-centre study over a period of 11 months from January 1, 2022 to November 1, 2022.

### Inclusion and non-inclusion criteria

Were included in our study all patients presenting to the traumatological emergencies of the CHUO for a leg fracture after ACR. Were excluded all patients consulting for leg fracture due to another cause

### Data collection

The data was collected from patients consulting in the emergency room of our hospital who met the inclusion criteria for our study, namely a fracture of one or both bones of the leg during an ACR, the data were recorded on a pre-established sheet, the data could be supplemented by a telephone call thanks to the various contacts mentioned in the medical files. The data collected was recorded on an individual sheet previously designed and validated by our masters.

The patients hospitalized during the consultation carried out by the emergency doctors were regularly seen to obtain new information and note the elements of their evolution. Patients treated on an outpatient basis received telephone calls to note possible post-consultation and treatment events, some of them were seen again during the last consultation attesting to their recovery.

### Ethical consideration

Authorization for the study was obtained from the competent authorities of the CHUO, as well as the head of the orthopedic-traumatology department of the said hospital.

Provisions have been made for the implementation of the study to guarantee confidentiality. The consent of the patients or their families in the event of their incapacity was given. Patient anonymity was respected.

### Statistical analysis

Data were entered using Excel 2019 software. Statistical analysis was performed with SPSS version 24 software. Categorical variables were expressed as a percentage and quantitative variables as mean and standard deviation. The association between qualitative variables was assessed by the Chi2 test (Or Fisher test for small numbers). The significance threshold was set at 5%. A multivariate analysis, by descending logistic regression step by step, made it possible to determine the results of our specific objectives set after selection of the significant factors at the threshold of 20% in the bivariate analysis.

## Results

**Sociodemographic data:** We collected a total of 64 patients, namely 39 male participants and 25 female participants, with an M/F ratio: 1.56 in favor of the male sex (Table 1). Patients in the 25 to 64 age group were the most represented, at 75%. The average age was 33.58 years with extremes between 6 and 63 years.

**Tables 1:** Distribution of patients according to gender and age group.

Variable		Effective	%
Number of participants		64	
Sex	Feminine	25	39.0
	Male	39	61.0
age range	[6-17]	8	12.0
	[18-24]	8	12.0
	[25-64]	48	75.0

**Additional reports:** The majority of patients had performed an X-ray (Figure 1) and biological examinations, ie 88% of the study population (Table 2).

**Tables 2:** Breakdown according to completion of additional assessments.

Variable		Effective	%
Balance sheet additional	X-ray	1	1.6
	X-ray / biology	56	88.0
	X-ray / biology / CT	7	11.0



**Fig 1:** Fractures. A: 42-year-old patient with an open leg fracture classified as Gustilo Anderson type 3-2b; B: Control radio on arrival at the emergency room.

**Treatments and Complications**

The majority of patients, i.e. 70%, had no complications after treatment (Table 3).

**Tables 3:** Distribution of patients according to the presence of complications after treatment.

Variable		Effective	%	95% CI
Complication	No	45	70.0	57.4 - 80.8
	Yes	19	30.0	19.2 - 42.6

Patients who had complications had more long-term complications (Table 4).

**Tables 4:** Breakdown by type of complication.

Variable		Effective	%
Type of Complication	Immediate	2	3.1
	Immediate, long term	2	3.1
	Immediate, medium term	2	3.1
	Long term	11	17.0
	Middle term	2	3.1
	No complications	45	70.0

The treatment was favorable in 91% of our patients (Table 5, Figure 2).

**Tables 5:** Distribution according to the evolution of the treatment.

Variable		Effective	%
Evolution	Unfavourable	6	9.4
	Favourable	58	91.0



**Fig 2:** Treatment. A: 42-year-old patient with an open leg fracture treated with an external fixator; B: Control X-ray after the pause of an external fixator; C: Patient seen again 8 months later

**Different associations after logistic regression**

Patients with a Cauchoix type 1 opening had a significantly unfavorable outcome (Table 6).

**Tables 6:** Distribution according to the type of opening in patients who had a change in treatment.

Variable		Unfavorable	Favorable	p-value
Type of opening	Cauchoix 1	2 (33%)	3 (5%)	0.015
	Cauchoix 2	1 (17%)	11 (19%)	
	Cauchoix 3	2 (33%)	7 (12%)	
	Not open	1 (17%)	37 (64%)	

There was no significance between admission time and treatment progress (Table 7).

**Tables 7:** Distribution according to the time of admission to a hospital structure and the progress of the treatment.

Variable		Effective (%)	p-value
Hospital admission time	>6h	2 (40%)	0.110
	1h-6h	3 (60%)	
	<1 hour		

There was no significance between the duration of hospitalization and the evolution of treatment in patients who were hospitalized (Table 8).

**Tables 8:** Distribution according to length of hospitalization and course of treatment

Variable		Unfavorable	Favourable	p-value
Duration of hospitalization	1 week - 1 month	3 (50%)	30 (52%)	0.236
	1 month	2 (33%)	5 (9%)	
	1 week	1 (17%)	11 (19%)	
	Not hospitalized		12 (21%)	

Patients with immediate and medium-term complications had the greatest chance of having an unfavorable evolution, this with significance (Table 9).

**Tables 9:** Breakdown by type of complication and course of treatment

Variable		Unfavorable	Favourable	p-value
Complication	immediate, medium term	2 (33%)		0.002
	Long term	2 (33%)	9 (16%)	
	Average term	1 (17%)	1 (2%)	
	No complications	1 (17%)	44 (76%)	
	Immediate		2 (3%)	
	Immediate, long term		2 (3%)	

There was no significance between the various complications in the patients and the progress of the treatment (Table 10).

**Tables 10:** Distribution according to the different complications in patients and the course of treatment.

Variable		Unfavorable	Favourable	p-value
Immediate Complication	Dermal	1 (50%)	3 (75%)	0.600
	Death	1 (50%)		
	Nervous		1 (25%)	
Medium Complication	Necrosis / gangrene	3 (100%)		0.250
	Embolism pulmonary		1 (100%)	
Long Complication	Osteitis	2 (67%)	2 (18%)	0.242
	Pseudarthrosis	1 (33%)		
	Bad callus		3 (27%)	
	Malfunction, psychosocial		1 (9%)	
	Psychosocial		4 (36%)	
	Consolidation delay		1 (9%)	

## Discussion

### Sociodemographic characteristics

We collected a total of 64 patients over a period of 10 months, these patients were mainly men, namely 61%, with a sex ratio M/F: 1.5:1, and an average age of 33.56 years. These results corroborate with those found by Palle John Ngunde and collaborators in a prospective study over 03 months concerning 411 patients carried out in the northwest of Cameroon which found a ratio of 1.4:1 in favor of men and an average age of 33.30 (+/- 16.04)<sup>[8]</sup>.

### Treatment and complications

The majority of patients in our study, ie 91%, had a favorable outcome after treatment, results which corroborate those of Nouhoum A. Diallo and collaborators who found almost 96% recovery in their study<sup>[9]</sup>.

Orthopedic treatment was the most used as a method of treatment in our study, surgical management when it was performed was more represented by an ECM at 29.68%, and post-treatment complications were more marked by osteitis (30% when a complication was present). These results are similar to those found by Tekpa BJD and collaborators in Bangui, with surgical management by ECM at 33.07%, but slightly higher complications represented by osteitis and soft tissue infections at 51.6%.<sup>[10]</sup>

After logistic regression and lesion association carried out, we obtained results that could allow some comments.

### Cutaneous opening and evolution of the treatment

Patients who had trauma with an open skin lesion of the Cauchoix type 1 type had an unfavorable evolution of the current treatment with a significance of  $p=0.015$ . The minimization by the treating staff of the damage to the soft tissues underlying the opening, thus adapting a less appropriate treatment to it, may in our opinion be responsible for this finding.

### Admission time and treatment progress

Patients received with an admission delay of more than 6 hours were mostly patients from rural areas where care had already been started, so there was no significant association between the hospital admission delay of more than 6 hours and the progress of treatment (p-value: 0.1110).

### Complications and course of treatment

The patients in our study presenting at the same time an immediate complication and a medium-term complication had the greatest chance of having an unfavorable outcome (p-value: 0.002).

### Conclusion

Leg fractures by ACR are a frequent reason for consultation in traumatological emergencies. Our prospective study aimed to study the clinical and therapeutic aspects, to determine the different complications of leg fractures due to ACR. Our study led to the following conclusions; Surgical treatment was the most used (64.1%) represented by ECM (34.34%). Orthopedic treatment was used in 35% of cases, represented by cruro-pedal plaster (91.3%). The suites were complicated in 29.6% of cases, most represented by osteitis (16%).

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### Conflict of interest



The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Abbreviations

ACR: American College Rheumatologic; CHUL: Libreville Hospital Center; CRP: C Reactive protein; eGFR: estimated glomerular filtration spleen; Hb: hemoglobin; SLE: Lupus Erythematosus scattered; LES: Lupus Erythematosus Systemic; MCHC: Corpuscular hemoglobin concentration; MCV: Mean Corpuscular Volume

### References

1. Akpoto YM, Abalo A, Gnandi-pio F, Sonhaye L, Tchaou M, Sama HD, *et al.* Epidemiological aspects of limb fractures related to the exercise of military function in Togo. *The Pan African Medical Journal.* 2015, 20.
2. Peden M, Oyebite K, Ozanne -Smith J. World report on child injury prevention. World Health Organization; c2009.
3. Roussignol X. Arthroscopic arthrodesis tibiotalar and subtalar joints. In: Teaching Conferences 2015 [Internet]; c2015. Available at: <http://www.sciencedirect.com/science/article/pii/B978-2-294-74982-7.00020-X>
4. Merle D' Aubigne R. Trauma of the leg. In: New summary of surgical pathology. 2nd. Paris: Masson & Cie; c1947. p. 639-50.
5. Ousmane A, Alhousseyni MD, Laouali HAM, Yahaya I, Ousseini A, Amadou O, *et al.* Risk factors and prevalence of HBs antigen in pregnant women and their newborns in Niamey, Niger. *Health Sciences and Diseases.* 2018, 19(3S).
6. World Health Organization. Road accidents [Internet]; c2022 [cited 2023 May 29]. Available at: <https://www.who.int/en/news-room/fact-sheets/detail/road-traffic-injuries>
7. Vilain JP, Lemieux C. The mobilization of victims of collective accidents. Towards the notion of circumstantial groups. *Politix Journal of the social sciences of politics.* 1998;11(44):135-60.
8. Ngunde PJ, Akongnwi ACN, Mefire CA, Then F, Gounou E, Nkfusai NC, *et al.* Prevalence and pattern of lower extremity injuries due to road traffic crashes in Fako Division, Cameroon. *Pan- African medical journal.* 2019, 32(1).
9. Nouhoum A Diallo. Management of leg fractures at Sikasso hospital from January 1 to December 31, 2007 [Internet]. [Faculty of Medicine, Pharmacy and Odontostomatology]: University of Bamako; c2008 [cited 2023 May 29]. Available at: [https://www.keneya.net/fmpos/theses/2008/med/pdf/08\\_M353.pdf](https://www.keneya.net/fmpos/theses/2008/med/pdf/08_M353.pdf)
10. Tékpá B, Diemer H, Mapouka I, Gassima B, Nali M. Mortality during road traffic accidents in Bangui, Central African Republic. *Tropical medicine and health.* 2017;27(4):426-30.

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