



Functional Outcome of Patients with Long Bone Fractures Discharged against Medical Advice before Definitive Treatment at the Yaounde Emergency Center: A Retrospective and Prospective Study

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Abstract

Background: Fractures of the long bones are becoming increasingly common in our environment, due to the upsurge in road accidents. In low- and middle-income countries such as Cameroon, where universal health coverage is still in its infancy, patients tend to orient their treatment choices according to their financial means. This study aimed to assess the functional outcome of patients with long bone fractures discharged against medical advice at the Yaounde Emergency Center. **Methods:** We conducted a retrospective and prospective descriptive and analytical study at the Yaounde Emergency Center (YEC). The study period was from June 2015 to December 2021. Any patient aged 18 or over with at least one long-bone fracture (humerus, radius, ulna, femur, tibia, fibula) discharged against medical advice from our study site and during the study period was included in the study. Sociodemographic and radio-clinical data were collected by examining the admission registers of the main care area, the trauma department, the hospitalization department, and the medical records. Patients were then contacted by telephone to invite them to return to the hospital to collect the type of treatment undertaken and we assessed the functional outcome. Statistical analyses were performed using SPSS version 26 software. **Results:** We found 206 patients in whom we were able to assess treatment and functional prognosis. The mean age was 35.4 (\pm 13.8) years, and 165 (73.4%)

were male. After discharge against medical advice, 124 (60.4%) patients opted for traditional fracture treatment, 76 (36.9%) preferred another hospital and 6 (2.7%) opted for therapeutic abstention. The average duration of traditional treatment was 91.70 (± 53.73) days, with extremes ranging from 21 to 180 days. Massage was the main method of traditional treatment in 81 (65.59%) patients. The average hospital stay for medical treatment was 12.39 (± 10.18) days, with extremes ranging from 2 to 45 days. Osteosynthesis was the medical treatment method used in 68 (87.8%) patients. The walking rate in patients opting for traditional treatment was 78.43%, with a normal walking rate of 56.86%. The walking rate in patients opting for medical treatment was 90%, with a normal walking rate of 85%. The rate of patients who regained normal walking was significantly higher in patients treated in other health facilities (85%) than in those treated by a traditional bonesetter (56.86%), ($p = 0.046$). **Conclusion:** In our environment, the majority of patients go to traditional bonesetters for the treatment of long-bone fractures, while others have left the Emergency Center in preference to another or to reunite with their families. Medical treatment has better results than traditional treatment, with the majority of patients regaining the functionality of their limbs and resuming their activities.

Subject Areas

Orthopedics

Keywords

Discharge against Medical Advice, Long Bone Fracture, Functional Outcome, Yaounde

1. Background

Fractures of the long bones are becoming increasingly frequent in our environment, due to the upsurge in traffic accidents and the invasion of our streets by two-wheeled vehicles [1]. These accident victims, initially transported to a health facility, do not continue to receive all their treatment there, and some are discharged against medical advice. Studies carried out in Africa on discharge against medical advice in emergency departments agree that patients with fractures, and particularly those with long bones, are those who are discharged the most against medical advice [2]-[5]. In Cameroon, a one-year study carried out in 2008 in the emergency department of the Yaounde University Teaching Hospital (YUTH) found that the diagnosis of fracture accounted for 87.3% of all discharges against medical advice [6].

Discharge Against Medical Advice (DAMA) is a term used in healthcare institutions when a patient leaves a hospital against the advice of his or her physician [7]. Lack of financial means to pay for medical care and the alternative to traditional treatment were two major reasons cited for SCAM [6]. Indeed, for cultural and anthropological reasons, and depending on the level of education and training, traditional treatment still retains great appeal, despite the serious complications

often reported [8]-[11].

DAMA is, therefore, a major trauma and public health problem, neither recent nor specific to Africa [2]. In Cameroon, a study by Ngongang *et al.* [12] of patients with long-bone fractures discharged against medical advice found a prevalence of DAMA of 45.07%, with lack of financial means and the assumed choice of traditional treatment being the reasons given. More than 60% of these patients went to a traditional masseur after discharge.

However, we could find no specific studies describing the outcome of these patients discharged against medical advice. The aim of our work was, therefore, to assess the functional outcome of patients with long-bone fractures discharged against medical advice from the Yaounde emergency department.

2. Methods

We conducted a retrospective and prospective descriptive and analytical study at the Yaounde Emergency Center (YEC). The study period was from June 2015 to December 2021. Any patient aged 18 or over with at least one long-bone fracture (humerus, radius, ulna, femur, tibia, fibula) discharged against medical advice from our study site and during the study period was included in the study. Excluded were patients who refused to answer our questions and to return for prognostic evaluation when contacted. Socio-demographic data were collected by examining admission registers from the main care area, the trauma department, the hospitalization department, and medical records. Patients were then contacted by telephone to invite them to return to the hospital to collect the type of treatment undertaken and we assessed the functional outcome by means described below. Statistical analyses were performed using SPSS version 26 software. To describe quantitative data, we used the mean (standard deviation) in the case of a normal distribution of data, or the median (range) in the case of an asymmetric distribution. Qualitative data in the form of numbers and frequencies. These data are presented in commented tables and figures. For comparison of quantitative variables, Student's t-test was used in the case of normal distribution. The significance level was set at 5%.

We have classified the socio-economic level according to the income of the main job performed, based on the results of the third survey on employment and informal sector in Cameroon published by the National Institute of Statistics.

To assess recovery of upper limb function, we asked patients to carry a 5 kg load with the injured limb. To assess limb support, we observed patients walking a distance of 5 meters. Normal walking was defined as walking without limping. Walking rate = normal walking plus walking with a limp.

Traditional treatment of fractures: any method used by the traditional bone-setters to restore bone continuity after a fracture: massage, traditional compression, animal fracture, spiritual spells. Bonesetters start with a firm massage of the fracture site with traditional balms and then place a traditional restraint to keep the limb straight; sometimes, very tight bandages are applied. In addition, they also use the bone of an animal (very often a chicken) on which they reproduce the

fracture and apply the treatments to that bone instead to heal yours.

Medical treatment of fractures: methods used in hospitals to restore bone continuity (plaster and surgical methods).

Limitations: At the time we contacted patients for functional outcome assessment, they were no longer all in the city of Yaounde. For patients who were out of town, we asked them to visit the referring doctor in their respective town, to whom we had previously sent our survey form for outcome assessment.

3. Results

From June 2015 to December 2021, of the 666 patients with long-bone fractures discharged against medical advice that we retrieved from the registries, only 216 records could be retrieved from the archives, from which 10 patients were excluded. In the end, we assessed the functional outcome of 206 patients (**Figure 1**).

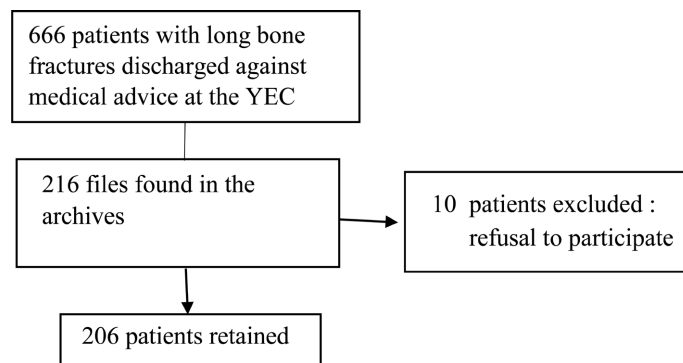


Figure 1. Flow chart.

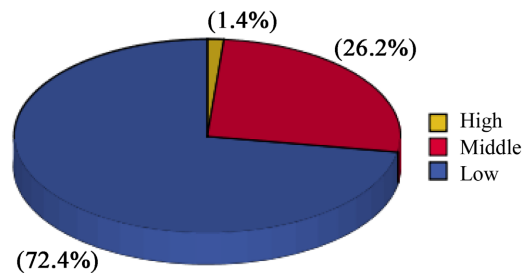
Socio-demographic and clinical data.

The mean age was 35.4 (± 13.8) years, and 165 (73.4%) patients were male. One hundred and eight (52.4%) patients in elementary occupations followed by 46 (22.4%) in craftsmen and related work (**Table 1**). Only 3 (1.4%) patients had a high socio-economic level, while 149 (72.4%) patients had a low socio-economic level (**Figure 2**). Regarding co-morbidities, 187 (91.6%) patients had no relevant history; however, 3 (1.5%) patients had a history of fracture, and 1 (0.5%) patient was diabetic (**Table 2**).

Road traffic accidents (RTAs) were the cause of trauma in 171 (83%) cases, followed by work-related accidents in 15 (7.5%) cases (**Figure 3**). The tibia was the long bone most affected, with 117 (39.18%) fractures, followed by the fibula and femur with 76 (25.67%) and 71 (23.59%) fractures, respectively (**Table 3**). A skin opening was found on 116 (38.8%) fractures. Among the 116 open fractures, Gustillo-Anderson type II was the most frequent, with 40 (34.5%) fractures, followed by type I and type IIIB with 29 (25%) and 28 (24.1%), respectively (**Table 4**). The fracture involved a single long bone in 102 (49.5%) cases (**Table 5**).

Table 1. Distribution of patients by occupation.

Occupations	Number (N = 206)	Percentage (%)
Directors	0	0
Professionals	14	6.8
Technicians and associated professionals	8	4
Office workers	3	1.4
Service and sales workers	6	3
Skilled agricultural, forestry, and fishery workers	3	1.4
Craftsmen and related workers	46	22.3
Machine operators and fitters	1	0.5
Elementary occupations (bike drivers, shopkeepers)	108	52.4
Armed forces	3	1.4
Students	14	6.8

**Figure 2.** Distribution of patients by socioeconomic level.**Table 2.** Distribution of patients by co-morbidities.

Co-morbidities	Number (N = 206)	Percentage (%)
Alcoholism	7	3.3
High blood pressure	3	1.5
Past history of Fractures	3	1.5
Psychiatric	2	1
Smoking	2	1
Diabetes	1	0.5
Another surgery	1	0.5
No relevant past history	187	90.7

Table 3. Distribution of fractures by affected bone.

Fractured bones	Number (N = 298)*	Percentage (%)
Tibia	117	39.18
Fibula	76	25.67

Continued

Femur	71	23.59
Humerus	15	5.19
Radius	11	3.53
Ulna	8	2.80

*298 is the total number of fractures as one patient may have more than one fracture.

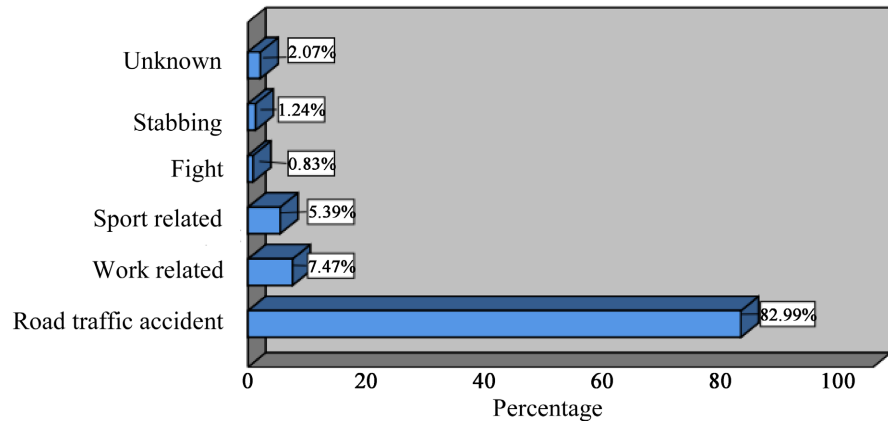


Figure 3. Distribution by trauma circumstances.

Table 4. Distribution of open fractures by Gustillo-Anderson type.

Gustillo-Anderson type	Number (N = 116)*	Percentage (%)
I	29	25
II	40	34.5
IIIA	17	14.6
IIIB	28	24.1
IIIC	2	1.7

*The number of open fractures.

Table 5. Distribution of patients according to the context.

Context	Number (N = 206)	Percentage (%)
One fracture	102	49.5
Multi fracture	82	39.8
Polytraumatized	22	10.6

Treatment undertaken

After discharge against medical advice, 124 (60.4%) patients opted for traditional fracture treatment, 76 (36.9%) preferred another hospital and 6 (2.7%) opted for therapeutic abstention.

Traditional treatment

The average duration of traditional treatment was 91.70 (± 53.73) days, with extremes ranging from 21 to 180 days. Massage was the main method of treatment

in 81 (65.59%) patients, sometimes combined or not with traditional restraint in 37 (30.1%) patients. Scarification and animal fracture were used very sparingly, in 1 (1.07%) cases each.

Medical treatment

The mean length of hospital stay for medical treatment was 12.39 (± 10.18) days, with extremes ranging from 2 to 45 days. Osteosynthesis was the most commonly used method of treatment in 66 (87%) patients who preferred another hospital, followed by 9 (12.2%) patients in whom plaster cast restraint was performed.

Functional outcome

Upper limb

In the case of the 12 patients with upper-limb fractures, all had opted for traditional treatment. Of these, 10 (83.3%) were able to carry a 5 kg load with the injured limb, while 2 (16.7%) were unable to do so.

Lower limb

The walking rate in patients opting for traditional treatment was 79%, with a normal walking rate of 56.45%. The walking rate for patients opting for medical treatment was 91%, with a normal walking rate of 85.5% (Table 6).

Table 6. Distribution of patients' limb support according to treatment undertaken.

	Traditional bonesetter	Another hospital	Therapeutic abstention
Does not walk	2	0	0
Walk without bearing on the injured limb	24	7	3
Walk with limping	28	4	3
Normal walk	70	65	0
Total (N = 206)	124	76	6

Analytical results

In our series, there is a correlation between the socioeconomic level and the chosen treatment ($p = 0.004$). There is also a link between the age and the recovery of the march ($p = 0.015$). There is no correlation between age ($p = 0.548$), sex ($p = 0.386$), and the type of treatment chosen, nor between sex ($p = 0.142$), the skin opening ($p = 0.766$), and the recovery walking. We have not found a link between the comorbidities ($p = 0.726$) and the functional prognosis, even about the history of fractures ($p = 0.546$).

Comparison of the rate of patients who regained normal walking after traditional treatment and after hospital treatment

The rate of patients who regained normal walking was significantly higher in patients treated in other health facilities (85.5%) than in those treated by a traditional masseur (56.45%), ($p = 0.046$).

4. Discussion

In our series, the average age was 35.47 (± 13.86) years, which is close to the results

obtained by Abdulrasheed *et al.* [2] and Pison *et al.* [6], who reported in their series an average age of 30 and 45.5 years. The 20 to 40 age group is the most involved, as it represents the active, productive population and the nation's greatest human resource.

Workers in elementary and artisanal occupations are the most affected by long bone fractures due to several socio-economic and environmental factors. In sub-Saharan Africa, particularly in Cameroon, these jobs often involve intense physical labor performed in unsafe conditions with limited access to protective equipment. Additionally, restricted access to healthcare and poor transportation infrastructure increase the risk of accidents. These workers, often with little awareness of preventive measures, represent a large portion of the workforce, which explains their overrepresentation among patients with fractures.

The fact that men account for the majority (73.4%) could be explained by the fact that they take more risks than women, natural risk-taking they have endowed, and as providers for their families, are therefore more active and more willing to do tasks that require a robust musculature than women, and therefore more prone to orthopedic trauma. They are also the decision-makers in the event of illness, whether for themselves or their families. This perceived idea is certainly linked to the religious origins making men the head of the family which may explain why they go out against medical advice more than women, as other authors have noted [2] [3] [6].

According to the research done by Farikou *et al.* [1] and Lamane *et al.* [13], Public Road Accidents were the main cause of trauma in 83% of cases. Failure to comply with the road code by users, and the Poor State of the Roads, road vandalism are some of the reasons in our context, despite the inestimable efforts of the Cameroonian government in road prevention. In our series, the lower limb was the most fractured, with a total of 264 fractures, compared with 34 for the upper limb. Leg fractures alone accounted for 64.85% of fractures. This corroborates the findings of Hodonou *et al.* [2], who found 64 fractures in the lower limb versus 10 in the upper limb, with leg fractures predominating at 61.54%.

The bad experience of a relative in a hospital, long emergency consultation times, lack of understanding of the medical procedure, refusal of a second operation to remove the osteosynthesis material, low perception of the seriousness of the disease, the geographical and financial accessibility of traditional treatment, and the widespread idea that the latter would have good results are all factors that lead the population to deliberately choose traditional treatment, and explain the preponderance (60.4%) of this destination among patients discharged against medical advice at YEC. This destination is all the more popular in our context because traditional bonesetters sometimes have positive results. In addition, the methods used (massage, bandage) in the traditional treatment that does not require surgery comforts these patients thus removing them from perioperative stress. Our study was carried out in a referral hospital, which implies high tariffs compared with lower-category hospitals for the same surgical treatment, hence

the high percentage (21.8%) of patients who preferred another hospital. The embryonic nature of universal health coverage and the non-popularization of insurance in our context require people to pay the costs related to the care in their pocket. The low socio-economic level of our population [14] pushes them therefore to treatment alternatives at the height of their financial means.

The massage was the most commonly used traditional treatment method in 65.59% of cases, followed by traditional restraint in 30.10% of cases, which corroborates the findings of Diakite *et al.* [15], who found the use of massage in 90.67% of cases and traditional restraint in 66.67% of cases. This would appear to be due to the fact that these are the methods that are readily available to bonesetters and they have been using for a very long time, and which, in their opinion, have demonstrated their efficacy.

Naturally, it is clear that independent of the type of treatment and gender, the young adult population consolidates more quickly usually by the absence of comorbidities in this age group. The Rate of Normal Walking and the ability to wear 5kg was significantly higher in those who had undergone medical fracture treatment than in those who had undergone traditional treatment. This corroborates the literature [13] [16] [17], which shows that in-hospital treatment of fractures, whether surgical or orthopedic, has a success rate, with timely healing of each bone studied, effective resumption of walking, and patient satisfaction, with very few complications reported (infection, fracture of osteosynthesis material).

The low rate of normal walking observed in patients who have opted for traditional treatment is thought to be due to regular massage, which continually mobilizes the fracture site and causes it to consolidate in a vicious attitude, resulting in multiple deformations and shortenings, sources of lameness and pain, not to mention the many other sometimes serious complications reported in the literature, such as limb gangrene, infection, nonunion and delayed union [8]-[11]. These traditional healers with undocumented results and experiences in our context, have nevertheless achieved results, although not all of them are satisfactory, as not all the patients who turn to them inevitably return to the health facilities with complications. This underscores the need, indeed the urgency, of bringing together traditional and medical practitioners, with a view to supervising the practice and raising the level of knowledge of bonesetters, so that they know how to distinguish between the type of fracture they can treat at their level and that which needs to be referred to hospital [18] [19]; synergy of action for the patient's well-being in the end, as traditional medicine is recognized even by the World Health Organization [20] [21]. This will not only improve the results obtained by traditional practitioners but also reduce the rate of complications they experience.

5. Conclusion

In our setting, the majority of patients with long bone fractures discharged against medical advice are young people with average to low incomes. Public road accidents are the major source of these injuries, with the lower limb being the most

affected. More than half of patients go to traditional masseurs for treatment of long-bone fractures, while others have preferred a hospital other than the Emergency Center, either for family reunification or for more affordable costs than YEC. Medical treatment has had better results than traditional treatment, with the majority of patients regaining limb functionality and resuming their activities.

Conflicts of Interest

The authors declare no conflicts of interest.

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