



An Injury Profile of Maxillofacial Trauma in Yaoundé: An Observational Study in Cameroon

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Abstract

Introduction: Maxillofacial Trauma (MFT) is an important condition because of its frequency, facial involvement and severity of injury. The aim of the study was to determine the lesion profile of patients suffering from maxillofacial trauma in three hospitals in Yaoundé.

Methodology: This was a descriptive study that took place over a period of 7 months during 2022; it included all maxillofacial trauma patients received in three hospitals in the city of Yaoundé. The sampling was consecutive and exhaustive. The data collected from the files of the patients recruited over five years from January 1, 2015 to December 31, 2020 were recorded in a pre-designed data processing form which was divided into socio-demographic data, clinical aspects and circumstances of occurrence of MFT. The information collected was entered and analyzed using SPSS version 25.0 software.

Results: Out of 491 patient records collected, 293 patients were included, i.e., a prevalence of 59.67% of exploitable documents. The male gender predominated with 75.1% of cases, with a gender ratio of 3.01. The age group 30 to 40 years was the most represented with a mean age of 34.4 years and extreme values of 5 and 83 years. Secondary education was found in 60% of cases and 73.7% of patients were workers. Maxillofacial trauma was caused by Road Traffic Accidents (RTA) in 71% of cases. Osteoarticular tissues were affected in 79.5% of cases with unifocal fractures (50.9%) and mandibular fractures (54.4%). The dental-alveolar injuries (25.3%) were of the type of dental expulsion (51.3%) and partial dislocation (40.5%). Mucosal trauma was associated in 56.3% of cases, with wounds in 47.9%.

Conclusion: Maxillofacial trauma primarily affects male workers in their third decade. They mainly result from RTA with polymorphous clinical incidences. The lesions may be osteoarticular or not associated with alveolar-dental or mucosal trauma.

Keywords

Maxillofacial Trauma; Osteoarticular Injury; Road Traffic Accidents; Yaoundé

Introduction

Maxillofacial trauma is the direct or indirect shock or concussion of the face that results in injury to the structures of the face [1]. Maxillofacial trauma in general has increased in frequency today with the growth of car fleets and the advent of motorbikes, despite preventive measures [2]. These injuries result in lesions which in the long term can evolve either into a complete recovery or into persistent sequelae [3]. The latter are defined as the state in which the lesions have become fixed and have taken on a permanent character such that treatment is no longer necessary, except to avoid aggravation, and it becomes possible to assess a certain degree of functional incapacity resulting in a loss [3,4]. Preferential bone damage may be due to exposure of the face, which itself is made up of many weak areas, the severity of which depends on the intensity of the impact; this impact is generally intense in the case of MVAs, the main cause of maxillofacial trauma [3,6]. The anatomical structures affected are mainly osteoarticular structures, alveolar-dental lesions which are mainly represented by dental expulsion, partial dental dislocations associated or not with dental fractures, and soft tissue lesions which can be caught between the bony contours and the vulnating agent [5,6,8].

A study in 2016 showed that the prevalence of maxillofacial trauma in the world could vary from 17 to 69%. This wide variation is thought to be due to variations in environmental factors, socio-economic conditions, cultural conditions and traffic regulations [5]. Injuries to the face comprise nearly 50% of the 12 million trauma cases presenting to Emergency Departments

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(ED) in the United States each year [6]. The resulting injuries can range from injury to disability and affect twenty to fifty million people [2]. Several studies agree that road traffic accidents are the main cause [5,7-10]. In Africa, the prevalence of maxillofacial trauma remains high, particularly in low-income communities; one study in Morocco puts it at 22.43% [10]. In Cameroon, the prevalence of maxillofacial trauma in 2020 was 23.2% [10]. In Cameroon, maxillofacial injuries are damaging and are the subject of complaints. The aim of the study was to determine the circumstances of occurrence of MFTs and the lesion profile of the victims.

Material and Methods

This was a descriptive cross-sectional study conducted from November 1, 2021 to June 1, 2022, in the stomatology and ENT departments of three hospitals in the city of Yaoundé: Yaoundé Central Hospital, Yaoundé University Hospital and the Cité-Verte District Hospital. The study population was subjects with maxillofacial trauma received between January 1, 2015 and December 31, 2020 registered in one of the aforementioned departments and whose files were well kept and archived.

In the retrospective phase, we included the records of maxillofacial trauma patients who were registered in one of the study hospital departments and had a telephone number on file, and those who had given written informed consent to participate in the study in the prospective phase. Records of unreachable patients and patients who refused to give informed consent were excluded. Our sampling was consecutive and not exhaustive.

After the administrative phase, we identified the files of victims of maxillofacial trauma that occurred at least 02 years previously; between January 2015 and December 2020. For each file found and meeting the inclusion criteria, we recorded the information in data collection forms, we contacted these victims and we proceeded to an interrogation coupled with a clinical examination. The results were recorded in the same data collection form.

The data collected were entered, recorded and analyzed using SPSS version 25.0 software; Microsoft Excel 2016 was used to analyze the results.

Results

Out of a total of 491 patients records collected, 293 cases of maxillofacial trauma were included. This represents a frequency of 59.67% of well-kept and archived records.

The average age was 34.8 ± 13.3 years, with extreme values of 5 and 83 years. The most common age group was between 30 and 40 years, representing 33.4% of cases. A male

predominance was found in 75.1% of cases, i.e., 220 patients, with a gender ratio of 3.01. Most of our participants (73.7%) were professionally active. The majority of the participants had secondary education (60.0%) followed by tertiary education (27.3%) as shown in Table 1.

The majority of maxillofacial injuries occurred at night, 60.4%. Road accidents were the main circumstance for the occurrence of maxillofacial trauma, accounting for 71% of cases (Table 2). The osteoarticular structure was found in 233 patients or 79.5% of cases. (Table 3). The most common osteoarticular lesions were fractures of the bone bases in 97.8% of cases.

The most frequent alveolar-dental lesions were dental expulsion and partial dislocation in 38 and 30 patients respectively, i.e., 51.3 and 40.5% of cases (Table 4). The most common mucosal or soft tissue injuries were wounds (47.9%) and oedema (33.9%).

Most of the fractures were uni-focal, found in 116 patients or 50.9% of the fractures. The preferred fracture site was the mandibular site in 124 patients, or 54.4% of fractures (Table 5).

Variables	Effectif (N=293)	Fréquence (%)
Age groups (in years)		
< 10	11	3,8
[10-20[	21	7,2
[20-30[	70	23,9
[30-40[	98	33,4
[40-50[	52	17,7
[50-60[	28	9,6
≥ 60	13	4,4
Gender		
Male	220	75,1
Female	73	24,9
Occupation		
Student	34	11,6
Student	27	9,2
Worker	216	73,7
Unemployed	16	5,5
Level of education		
Primary	36	12,3
Secondary	177	60,0
Higher	80	27,3

Table 1: Distribution of the population according to socio-demographic characteristics.

Variables	Effectif (N=293)	Fréquence (%)
Period of Onset		
Diurnal	116	39,6
Night	177	60,4
Circumstance of Occurrence		
Road accident	208	71,0
Stroke and injury	46	15,7
Domestic accident	19	6,5
Sports accident	17	5,8
Accidents at work	3	1,0

Table 2: Circumstances of occurrence of maxillofacial trauma.

Anatomical structure	Effectif (N=293)	Fréquence (%)
Osteoarticular	233	79,5
Soft tissue	165	56,3
Alveolar-dental	74	25,3

Table 3: Description of the frequency of damage to anatomical structures.

Variables	Effectif (n)		Fréquence (%)
Types of alveolar lesions(N=74)			
Tooth expulsion	38		51,3
Partial dental dislocation	30		40,5
Dental fracture	25		33,8
Alveolar fracture	16		21,6
Dental contusion	2		2,7
Soft tissue injuries (N=165)			
Wound	79		47,9
Swelling	56		33,9
Contusion	41		24,9
Dermabrasion	30		18,2
Laceration	5		3,0
Osteoarticular injuries (N=233)			
Fractures	228		97,8
Dislocations	5		2,2

Table 4: Description of dental, mucosal and osteoarticular lesions.

Types of Fracture	Effectif (N=228)	Fréquence (%)
Unifocal	116	50,9
Bifocal	53	23,2
Multifocal	49	21,5
Comminutive	10	4,4

Table 5: Characteristics of fractures.

Discussion

The age range most represented in our study population was between 30 and 40 years. This result is different from that of Lida, et al., in Korea in 2002 who reported a predominance of maxillofacial trauma in the age group between 10 and 20 years [11]. This difference could be explained by the early involvement of young people in sports activities in Korea [11]. Whereas in our context this predominance would be justified by the fact that males in their third decade are more active and energetic; they have intense social interaction making them more susceptible to various traumas [12].

In our study, the gender ratio was 3.01 in favour of the male gender. These results corroborate those of Randriamanampisoa, et al., who found in 2016 in Madagascar a gender ratio of 3.03 [12]. However, this result is higher than the one found by Lebeau, et al., in France in 2006 who reported a gender ratio of 2. This difference can be explained by the fact that in the West, women are much more active and involved in economic, cultural and social activities; thus, they are equally exposed to RTAs, sports accidents and assaults [13].

Most of our participants, 73.7%, had a known professional activity; these results are in agreement with those of Traoré MS and Dramé BM who obtained 58.6% and 64.3% respectively in Mali in 2020 [3,14]. This result can be explained by the fact that in Cameroon, the working population is mostly young, and therefore exposed to maxillofacial trauma [12,15,16].

The main etiology of maxillofacial trauma was RTA (71.0%) followed by assault (15.7%); this result is corroborated by that of Bali R, et al., who in India in 2013 found 71.9% for RTA [17]. Traoré MS, et al., in 2020, in the same sense, found a greater representation of RTAs in Mali. (79.6%) followed by 9.4% for assaults [3]. However, in Guinea Conakry in 2017, Diallo AO et al found that the main cause of facial trauma was intentional assault and battery (81.3%), followed by RTA (11.50%). This difference can be explained, on the one hand, by the fact that in Guinea Conakry, extreme poverty and promiscuity lead to an increasingly violent population [9]. On the other hand, in our context, the popularisation of means of transport, the poor state

of the roads, and the social situation are becoming factors that favour maxillofacial trauma [12].

The anatomical structures affected were mainly osteoarticular structures (79.5%), followed by soft tissue (56.3%) and dental structures (25.3%). This result is almost similar to that found by Traoré MS, et al., in Mali in 2020, who found a predominantly osteoarticular involvement (98.1%) followed by soft tissue involvement at 54.11% [3]. This preferential bone damage could be due to the exposure of the face, which is itself made up of numerous weak areas, the severity of which depends on the intensity of the impact. This impact is generally intense in the case of RTA, the main cause of maxillofacial trauma [3,18].

Dental-alveolar injuries were mainly represented by avulsion (51.3%), followed by partial dislocation (40.5%). These results are similar to those of Ngaba, et al., who found in a study conducted in Cameroon in 2020 respectively 54.7% and 40.4% [2]. This could be explained by the fact that the anterior teeth are the most involved and are implanted in a low-density alveolar bone, which is not very resistant to violent shocks and facilitates the extrusion of these teeth. The majority of soft tissue lesions were wounds (47.9%); this result is similar to that of Dramé BM, et al., in 2020 in Mali, who found such wounds in 36.97% of cases [19]. These findings can be explained by an indirect mechanism where the soft tissue can be caught between the bone contours and the vulnating agent [12].

Of the osteoarticular injuries, fractures and dislocations were present in 97.8% and 2.2% respectively. In the same order, Randriamanampisoa, et al., found fractures (99%) and Bagayoko, et al., found them at 98.5% [12,18]. This could be explained by the fact that the face is more made up of bones that are fused together than of joints.

In our study, the fractures were mainly unifocal (50.9%); this result is corroborated by that of Ougandere, et al., who found them in 52% of cases.

The fracture sites were mainly mandibular (54.4%). These results are in agreement with those of Rocton, et al., (51%) and Mossus, et al., (53.7%) in Cameroon in 2020 [10,19]. Mobility, anatomical position and the presence of weak areas (lower face bumper) explain the high frequency of mandibular fractures [20]. However, Rabenandrasana, et al., found in 2019 in Madagascar a predominance of middle-stage structures (61.5%) ahead of lower-stage structures present at 30.80% [21]. This would be due to the presence of facial shock absorbers such as the nasal bone and the zygomatic bone; similarly, the prevalence of accidents involving civil liability is not negligible (26.08%), making the middle floor a preferred area for attacks [5].

Conclusion

The majority of patients with maxillofacial trauma were male, adults in their early thirties, and in professional occupations. Nocturnal RTAs were the main causes of TMF. Mandibular osteoarticular injuries, whether or not associated with soft tissue injuries, were the most common.

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Conflict of Interest

There are no conflicts of interest.

References

1. Douamba J. Les traumatismes maxillo-faciaux chez l'adulte. Ouagadougou. 1998.
2. Ngaba O, Yousse D, Zing S, Bengondo C. Fractures maxillo-faciales dues aux accidents de la circulation routière: aspects épidémiologiques et cliniques dans trois hôpitaux de la ville de Yaoundé. IJISR. 2021;3(7):1529-33.
3. Traoré MS. Evaluation du dommage corporel chez les traumatisés de la face dans le service d'Odontostomatologie et chirurgie maxillo-faciale: à propos de 181 cas à l'hnf de Ségou [PhD Thesis]. [Mali]: Université des sciences des techniques et des technologies de Bamako. 2020.
4. Hervé V. Les traumatismes maxillo-faciaux et leurs implications en pratique odontologique : Intérêts d'une approche pluri-disciplinaire - Recherche Google. Université de Lorraine. 2011.
5. Singaram M, G SV, Udhayakumar R. Prevalence, pattern, etiology, and management of maxillofacial trauma in a developing country: a retrospective study. J Korean Assoc OralMaxillofacSurg. 2016;42(4):174-81.
6. Borle RM. Textbook of oral and maxillofacial surgery. JP Medical Ltd. 2014:830.
7. Bardaa S, Dhoubi H, Ennouri H, Hammami Z, Maatoug S. Maxillo-facial trauma: epidemiological study and legal implications. IJCOMS. 2020;6(1):6.
8. Millogo M, Konsem T, Assouan C, Garé J, Ouedraogo D. Prise en charge des traumatismes maxillo-faciaux par arme blanche. Rev Col Odonto-Stomatol Afr Chir Maxillo-fac. 2013;20(2):4.
9. Diallo A, Itiere Odzili F, Keita A, Bah M, Alloh H, Kouroum A, et al. Traumatismes Isolés de la Face à Conakry : Considérations Épidémiologiques et Prise en Charge. Health Sci Dis. 2017;18(4):4.
10. Mossus Y, Mindja DE, Bohimbo JE, Atangana EB, Biouele RM, Bambebong D, et al. Traumatismes Maxillo-Faciaux: Profils Cliniques et Thérapeutiques dans Deux Hôpitaux de la Ville de Yaoundé. Health Sci Dis. 2021;22(6).
11. Lida S, Matsuya T. Pediatric maxillofacial fractures: their etiological characters and fracture patterns. J Cranio-Maxillofacial Surg. 2002;237-41.
12. Randriamanampisoa J. Profil épidémiologique, anatomo-pathologique et aspects thérapeutiques des traumatismes maxillo-faciaux. [Madagascar]: Université d'Antananarivo faculté de Médecine. 2016.

13. El Shehaby D, Farahat A, Shahine M, Mohammed H. Medico-legal evaluation and trend of the different patterns of maxillofacial fractures concomitant with closed head injury in upper Egypt: retrospective study. *Egyptian J Forensic Sci.* 2020;10:9.
14. Dramé B, Bagayoko T, Traoré M, Sanogo A, Traoré S, Doumbia A, et al. Le profil épidémiologique des traumatismes maxillo-faciaux à l'hôpital Nianankoro Fomba de Ségou. *Revue Malienne de science et technologie-ISSN 1987-1031 série B: Médecine humaine, pharmacie, production animale.* 2020;01(24):26-34.
15. Lebeau J, Kanku V, Rabenandrasana F, Morand B, Sadek H, Raphael B. Traumatismes faciaux au CHU de Grenoble : étude épidémiologique de 961 dossiers sur une période de 365 jours. *Revue de Stomatologie et de Chirurgie Maxillo-faciale.* 2006;107(1):23-9.
16. Bali R, Sharma P, Garg A, Dhillon G. A comprehensive study on maxillo-facial trauma conducted in Yamunanagar, India. *Inj Violence Res.* 2013;5(2):108-16.
17. Borle RM. Textbook of oral and maxillofacial surgery. JP Medical Ltd. 2014:830.
18. Bagayoko T, Dramé B, Bah A, Kassogué A, Koné S, Keita M, et al. Le préjudice corporel chez les traumatisés de la face admis à l'hôpital Nianankoro Fomba de Ségou. *Mali Santé Publique.* 2021;11(02):67-75.
19. Rocton S, Chaine A, Ernenwein D, Bertolus C, Rigolet A, Bertrand J, et al. Fractures de la mandibule: épidémiologie, prise en charge thérapeutique et complications d'une série de 563 cas. *Revue de Stomatologie et de Chirurgie Maxillo-faciale.* 2007;108(1):3-10.
20. Coulibaly A, Boubacar B, Keita K, Thioukany D, Tiémoko D, Diombana M. Epidémiologie des traumatismes mandibulaires traités au CHU-CNOS de Bamako: 57 cas. *African J Dentistry and Implantology.* 2021:30-6.
21. Rabenandrasana F, Ndrianarivony S, Ratovoarisoa D, Razafindrabe J, Rakotoarivony A, Rakotoarison R. Etude épidémiologique des traumatismes maxillo-faciaux au CENHOSOA. *Revue d'odontostomatologie malgache.* 2019;16:29-34.