

Craniofacial Horn Injuries: Rares Lesional Entities at the University Hospital of Bouaké (Côte d'Ivoire)

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Abstract

Aim: Describe the epidemiological, clinical and therapeutic particularities of craniofacial trauma by encornment. **Type of study:** This was a retrospective and descriptive study. **Material and methods:** It took place in the surgical emergency departments of Bouaké (Côte d'Ivoire) University Hospital from January 2013 to December 2017, for a period of 5 years. It focused on patients of 0 to 5 years old admitted for craniofacial trauma involving the horn of a bovine. **Results:** Of the 26 cases of traumatic encornment, 11 were craniofacial location (42%). There were 9 male and 2 female victims. The average age was 10.54 years with extremes of 6 months and 24 years. Patients came from rural areas of Côte d'Ivoire. Bovids were responsible for all causal encornments. The lesions involved the scalp (3 cases) and the face (8 cases). The lesions were cutaneous-musculo skeletal in 7 cases. The surgical treatment included debridement associated to a suture in all cases and associated with maxillo-mandibular blockage in 3 cases and duro-cranioplasty in one case. **Conclusion:** In the local context, facial cranio traumatism by encornment is rare and seems to be essentially infantile, masculine and rural problem.

Keywords

Cranio, Facial, Trauma, Encornement, Cow

1. Introduction

Cattle can cause serious and sometimes fatal injuries [1]. In case of human ag-

gression, cattle most often use their horns [2] and can reach all parts of the human body with some local sepsis to be considered in management [3]. Bovine horn injuries to the head and neck are less common than genital and abdominal injuries, but are more serious and more likely to cause death [3] [4]. The injuries caused by the horn may be due to cattle but also to other animals. This type of injury is common in Spain and the Ibero-American countries, where bull-fighting, heifers and bullfights are common place. Apart from attractions, these are professionals who are exposed to these traumas: veterinarians, breeders and cattle slaughterers etc. [3]. In India, the frequency of cattle accidents is directly related to the phenomenon of bulls and cows roaming the parks, feeding on grass and basking in the sun in metropolitan cities [2]. In Africa, the existence of trauma caused by cattle on farms is known, the frequency and severity of lesions are the least known [5] [6]. In Ivory Coast, Bouaké is the capital of the center and the north of the country which has been separated from the rest of the country because of the military-civil conflict for nearly 10 years [7]. This has resulted in a change in the socio-demographic configuration and a reduction of the hospital technical platform. This suggests the difficulty that could be represented by the preventive and curative management of craniofacial lesions by encornment in such a context. To compensate for the insufficiency of local epidemiological data and to optimize the management of cranio-facial lesions by horn, it seems appropriate to establish a local database using a study whose aim was to determine the epidemiological, clinical and therapeutic characteristics of craniofacial trauma by animal horns.

2. Material and Methods

This was a retrospective and descriptive study that took place in the surgical emergencies of the CHU Bouaké from January 2013 to December 2017, a period of 5 years. It concerned all patients admitted for craniofacial trauma by horn. All cranio-facial lesions resulting from an animal aggression with a causative agent other than horns were not included in the study. The studied parameters were epidemiological (frequency, age, sex, location, activity), clinical (circumstance and description of lesions) and therapeutic (medical and surgical). Cranio-facial computed tomography (CT) and/or standard radiography were systematically requested and performed. The data were collected from a survey form developed for this purpose and then processed using Epidata and SPSS software in its French version. The entries, tables and graphs were made with the software Word 2007 and Excel 2007.

The different study protocols carried out have been validated by a local ethics committee.

3. Results

Of the 26 patients admitted for the period, 11 were traumatized craniofacial (42%). There were 9 boys and 2 girls. Ten of the patients (90.9%) had an age

whose extremes were 6 months and 14 years. One patient was 24 years old and the mean age of the entire study population was 10.54 years. The animals causing the trauma were all oxen. Patients came from a rural area in the central region of Côte d'Ivoire in 4 cases and in the northern region in 7 cases. Horning occurred in the context of domestic accidents (4 cases), field work (4 cases) and pastoral activities (3 cases). During trauma, the patients were standing (7 cases) or in supine position (4 cases). Examination of consciousness was normal in 9 patients and impaired in 2 patients. The locations of the cranio-facial lesions are presented in **Table 1**. The wounds had a linear form in 3 cases, punctiform in 2 cases and arciform in 6 cases. The banks were regular in 8 cases, irregular in 1 case and contused in 2 cases. Outside the skin, muscle, mucous and bone planes could also be damaged (**Table 2** and **Figure 1**). Brain tissue was reached in 2 cases. The bone lesions were mandibular (2 cases), occipital (2 cases), frontal (1 case), maxillary (1 case) and naso-maxillary (1 case) (**Figure 2(a)** and **Figure 3**). Computed tomography was performed in 3 patients and standard radiographs in 8 cases. Management was performed in odontostomatology and maxillofacial surgery (7 cases), pediatric surgery (2 cases) and neurosurgery (2 cases). Two of the patients stayed in intensive care. In all cases, antitetanus serum and probabilistic bi antibiotic therapy based on 3rd generation cephalosporin and imidazole was administered. Vaccines against meningitis were performed in 2 cases. Surgical treatment was necessary in all cases (**Table 3**) (**Figure 2(b)**). The average duration of admission was 4 days. The evolution was favorable in 9 cases. Postoperative complications were marked by suppuration in one case. One of the patients was lost to follow-up after the surgical treatment.

Table 1. Distribution by location of facial wounds.

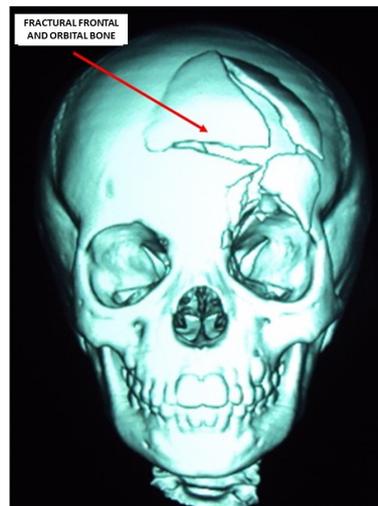
Location of wounds		Effective	Percentage (%)
Face	Scalp (occipital region)	3	27.27
	Cheekregion	3	27.27
	Mental	2	18.19
	Nasojugal region	1	9.09
	Labio-jugal region	1	9.09
	Frontal	1	9.09
Total		11	100

Table 2. Distribution according to the lesional plans.

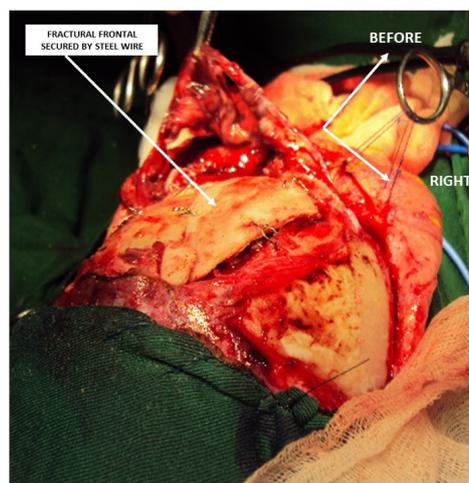
Injury plans	Effective	Percentage %
Skin and muscle and bone	7	63.64
Skin and muscle and mucosa (transfixiant)	2	18.18
Skin and muscle	2	18.18
Total	11	100%



Figure 1. Transfixing arciform wound of the left cheek.



(a)



(b)

Figure 2. (a) Frontal cranioccephalic wound; (b) Frontal cranioplasty.



Figure 3. Occipital cranioccephalic wound.

Table 3. Distribution according to surgical treatment.

Surgical treatment	Effective	Percentage %
Suture	7	63.64
Suture with maxillo-mandibular locking	3	27.27
Suture with duroplasty and cranioplasty	1	9.09
Total	11	100%

4. Discussion

Among cranio-facial injuries, cranio-facial lesions were relatively common. But overall, the frequency of said lesions was low. The number of cases could potentially be higher if one could count the victims in care outside the medical community or deceased before their admission to a reference health center. Nevertheless, despite this bias as described, the frequency of cranio-facial lesions by horn is less important in some countries culturally attached to attractions related to horned animals. Martinez-Ramos found 3.1% facial lesions and 16% Chambers [8] [9]. The largest series of recorded cases of coronary injury showed an average age of between 20 and 30 years [3]. In our context, the patients were children in 90% of the cases, with an average age of 10 years. They all came from rural areas and the majority practiced agropastoral activities. It is clear that the poverty inherent in the countries of sub-Saharan Africa leads to the deterioration of the living conditions of households who are forced to favor their daily survival rather than to prepare their future well-being. In other words, they immediately use the productive capacity of children in the labor market [10] [11]. The central and northern regions of Côte d'Ivoire also seem to be affected by these phenomena, and oxen are ideal animals for pulling agricultural carts [12]. In Burkina Faso, 80% of the inhabitants live from agriculture and livestock

farming. Livestock is the essential cultural and professional activity of Fulani who make up 10% of the population of Burkina Faso [13]. Other children are apprentice cowherd at a very young age, as is the case in other parts of Africa such as Chad [14]. This proximity to these animals with unpredictable mood constantly exposes them to this type of incident. This also raises a problem of parental responsibility. Among the craniofacial lesions, the face was most often affected and the victims were most often standing. Indeed the small size of the children was at the origin of a quasi equivalence of height between their head and that of the cattle. Adults tend to have the abdomen and genitals at the level of bovine horns [2]. The wounds in the study were most often arciform and deep with bone penetration sometimes in the brain [15] [16]. However, if we consider the work of Rani *et al.*, lesions of the bull's horn are bruises, lacerations, penetrating wounds but rarely fractures [2]. It is possible to find the reason for the frequency of fractures in our study in the texture of the bones of children and adolescents in the mineralization phase. To this must be added malnutrition, common among children in rural areas and likely to slow bone mineralization [17]. Other authors justify bone fractures by the proximity of skull bones and the protected side by more or less fine layers of soft tissue [13]. The practice of de-horning which is widespread in Western countries such as France and which would be beneficial for the protection of children living near livestock in Côte d'Ivoire [18] should be considered. Bi antibiotic therapy and tetanus prevention have been systematically performed. Prevention against meningitis has been carried out in cases of suspicion of osteo-dural breach. All these precautions were in response to the high potential of septic sores caused by horns. In addition, Chambers *et al* described bovine horn lesions as single lesions associated with lacerations, bruises and infections [9]. This presumed sepsis of the lesions also explains the latency of the surgical management which allows debridement of the wound and avoids an outbreak of germs in a vacuum. This is probably the reason why Lloyd *et al* have historically indicated that suture wounds were left open or partially open, with broad-spectrum antibiotic therapy [19]. The evolution has been favorable most often. This is because vital and noble organs were rarely affected. Suppuration observed postoperatively was due to either a lack of antibiotic coverage or a debridement defect of the initial wound. It must be assumed that the rising curve of the trajectory of the bull's horns limits the deep penetration of vital craniofacial organs such as the brain [3].

5. Conclusion

At the end of this study, it should be noted that the low sampling rate does not allow us to be formal about socio-demographic and clinical trends. Nevertheless, in our context, it is possible to point out certain evidences as to the essentially infantile, masculine and rural character of craniofacial traumatism by horns.

Conflict of Interest

The authors declare no conflict of interest.

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