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Management of Severe Caustic Lesions of the Upper Digestive Tract at the Brazzaville University Hospital

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Abstract

Caustic ingestions represent a medical-surgical emergency that requires multidisciplinary collaboration (gastroenterologists, visceral surgeons, intensive care specialists, toxicologists, and psychiatrists). **Goal:** To improve the management of severe caustic lesions of the upper digestive tract. **Patients and Methods**: This was a retrospective, descriptive study covering a five-year period from January 1, 2013 to December 31, 2018. It took place at the Brazzaville University Hospital Center in the Gastroenterology and Internal Medicine (GEMI) and Digestive Surgery departments. We included all patients 18 years of age and older admitted for ingestion of caustics with severe lesions or with upper gastrointestinal endoscopy that showed caustic lesions stages IIb to IV according to the Di-Constanzo classification. The study variables were epidemiological, clinical, morphological, evolutionary and therapeutic. The study data were entered and analyzed using Microsoft Excel version 2016, CS Pro version 7.2, and SPSS software. Quantitative variables were expressed as ± standard deviation. Qualitative variables were expressed as percentages. The range of values considered normal was ±2 standard deviations. **Results:** Severe caustic lesions were found in 60 cases, *i.e.*, a frequency of 31.6%. There were 16 women and 44 men, *i.e.*, a sex ratio of 2.8 with an average age of 35.58 years. Sulphuric acid was the most commonly used caustic in 29 cases, *i.e.*, a frequency of 48.3%. The amount of the product ingested was approximately ≥ 150 ml in 32 cases or 53.33%. The time to admission was less than 24 hours in 34 cases, *i.e.*, 56.7%, and the time to perform upper gastrointestinal endoscopy was more than 24 hours in 19 (31.7%) of the cases. The damage was diffuse,

oesophagus and stomach simultaneously. Peripheral parenteral feeding was practiced in all cases. Stenosis was the major complication in 29 (48%) patients. No emergency surgery was performed, and complication surgery was performed in 3 (5%) patients. **Conclusion:** The management of severe caustic lesions is inadequate. The time taken to admit and take the exams is late. Emergency surgery, which is the ideal treatment, is not performed in our context.

Keywords

Severe Caustic Lesions, Upper Digestive Tract, Management, University Hospital-Brazzaville

1. Introduction

Severe caustic burns of the digestive tract are a common emergency in adults [1]. Their management is immediate and multidisciplinary (gastroenterologists, visceral surgeons, emergency physicians, intensive care specialists, otolaryngologists, toxicologists and psychiatrists), depending on the degree of severity of the lesions [1] [2]. In developed countries, care is well codified. Severe caustic lesions are classified as stages II and III, and their management is special. However, in African hospitals in general and in Congo in particular, there are no recommendations, the technical platform is inadequate, and the cost of care is high. The complications of these lesions are serious [2] [3]. It is with this in mind that we carried out this study to improve the management of these lesions.

2. Patients and Methods

This was a retrospective descriptive study conducted in the gastroenterology and internal medicine department and the digestive surgery department of the Brazzaville University Hospital from January 1, 2013 to December 31, 2018. We included in the study all patients over 18 years of age admitted for ingestion of caustic with severe lesions, *i.e.*, classified as stages IIb to IV according to the Di-Costanzo classification. We did not include all patients who ingested a caustic but could not undergo an upper digestive endoscopy, all patients with lesions classified as stage I, IIa according to the Di Constanzo and/or Zargar classification and all patients whose records were incomplete. Survey data were collected from hospitalization records, death records, surgical reports and medical records from departments. The study variables were epidemiological: age, sex, origin and professional status, which was studied to assess the patient's ability to bear his or her hospitalization costs, personal psychiatric history (manic-depressive disorders, chronic hallucinatory psychoses, suicide attempts, depression, mental deficiency, puerperal psychosis); clinical variables (circumstances of voluntary or accidental ingestion, nature of caustic, quantity ingested, time of admission to hospital, procedures performed after ingestion, functional signs), signs of severity (neurologi-

cal disorders, respiratory distress, state of shock, signs of peritonitis); morphological variables (time taken to perform endoscopy and results; chest X-ray; abdominal ultrasound; the time taken to carry out the oesophageal gastroduodenal transit; naso-fibroscopy; tracheobronchial endoscopy; CT scan). Di Costanzo's classification classifies patients into four stages: Stage I: Petechiae or erythema; Stage IIa: linear or round ulcerations; Stage IIb: circular or confluent ulcerations; Stage IIIa: localized necrosis; Stage IIIb: extensive necrosis; Stage IV: Perforation. Therapeutic data, which consisted of resting the digestive tract, parenteral nutrition, antibiotic therapy, antisecretory drugs, analgesics, corticosteroids, and the administration of blood components, was medical. The therapeutic surgical was surgical procedures performed: a feeding jejunostomy, a gastrectomy, a partial gastrotomy, a laparotomy, duodenal resection. The study data were entered and analyzed using Microsoft Excel version 2016, CS Pro version 7.2, and SPSS software. Quantitative variables were studied on average ± standard deviation. Qualitative variables were expressed as percentages. The range of values considered normal is ±2 standard deviations.

3. Results

During the study period, 190 adults were admitted to the Gastroenterology and Internal Medicine departments as well as to the Digestive Surgery departments for caustic ingestion, and benefited from upper gastrointestinal endoscopy. The annual average was 37 cases/year. Our study involved a group of 60 patients whose caustic lesions were classified from IIb to grade IV according to the Di-Constanzo classification, *i.e.*, a frequency of 31.6%. The age of the patients ranged from 16 to 66 years, with a mean of 35.58 years and the standard deviation of 11.6. The most represented age group was between 35 and 44 years old. Table 1 shows the distribution of patients by age and sex (as shown in Figure 1). These were 44 men (73.3%) and 16 women (26.7%), *i.e.*, a sex ratio of 2.7. Ingestion was suicidal in 45 cases or 75%. Table 2 shows the circumstances of ingestion by gender. The nature of the caustic was sulphuric acid in 29 cases (48.3%), bleach in 9 cases (15%), soda in 7 cases (11.7%), herbal teas from traditional preparations in 5 cases (8.3%),

Table 1. Distribution of patients by age and sex.

Age Range	Sex			
	Masculine		Female	
	n	%	n	%
16 - 24	7	15.9	5	31.3
25 - 34	14	31.8	4	25
35 - 44	15	34.1	3	18.8
45 - 66	8	18.2	4	25
Total	44	100	16	100

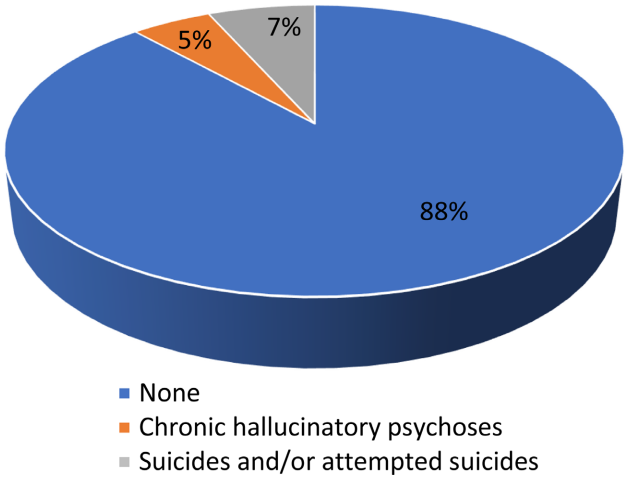

Figure 1. Distribution of patients according to psychological profile.

Table 2. Circumstances of ingestion by sex.

Circumstances of ingestion	Sex			
	Male		Female	
	n	%	n	%
Voluntary	34	77.3	11	68.8
Accidental	7	15.9	2	12.5
Unspecified	3	6.8	3	18.8
Total	44	100	16	100

unknown in 10 cases (16.6%). Eleven patients, or 18.3% of the cases, had attempted forced vomiting after ingestion of caustics. No procedure was performed in 49 patients. The time to hospital admission ranged from 1 - 24 hours in 34 patients (56%), 48 - 72 hours in 7 patients (11.7%), and more than 72 hours in 19 (31.7%). The time between the ingestion of caustic acid and the consultation varied from one hour to more than seven days. Clinical symptomatology at admission of patients was variable. Table 3 shows the clinical signs on admission. Therapeutically, resting of the digestive tract was performed in all patients. Parenteral feeding was performed in 57 patients or 95%. Caloric intake was provided by the infusion of serum glucose at 5% or 10% in all patients. Vitamin intake through ready-to-use nutrient preparations was made in four patients (6.7%). The surgical treatment concerned the after-effects and repairs. Cold surgical treatment was performed in three patients, *i.e.*, 5%. Among these patients, one patient had stage IIIb esophageal lesions complicated by stepped esophageal stenosis, and one patient had stage IIb esogastroduodenal lesions complicated by esophageal stenosis and one stage IV patient (gastric perforation). The first had undergone a laparotomy followed by a peptic bypass with jejunostomy, the second had received a feeding jejunostomy and the last had received a partial gastrectomy. Feeding jejunostomy was performed in 5 patients (8.3%) for two indications: esophageal and pyloric stenosis and

Table 3. Clinical and physical signs on admission.

Clinical Signs	**Effective**	**(%)**
Vomiting	51	85
Abdominal tenderness	45	75
Epigastralgia	33	55
Hématémèse/méléna	30	75
Dysphagia	11	18.5
Odynophagia	11	18.5
Mental confusion	8	13.3
Anémia	5	8.3
Low blood pressure	5	8.3
Tachycardia	5	8.3
Fever	5	8.3
Cough	2	3.3
Hypersialorrhea	2	3.3
Respiratory distress	1	1.7

preparation for cold surgery. In total, after medical treatment, 19 patients (31.7%) had a favorable outcome with regression of endoscopic lesions, and total recovery. While 29 patients had developed esogastric stenosis (48.3%) and 12 patients (20%) had presented complications (superinfection of lesions, inhalation pneumonitis, severe anaemia, malnutrition, hydro-electrolyte disorders). After surgery, the post-operative follow-up was simple in one patient, while the other two patients died. In total, there were 15 deaths (25%). Five patients were discharged against medical advice (8.3%) and were lost to follow-up.

4. Discussion

The frequency of caustic ingestion is variously reported around the world. We found a frequency 31.6% lower than those reported by other African authors [4]. However, our results are higher than those reported in Europe and Asia [5] [6]. This discrepancy could be explained by the sampling used in these studies. The average age is comparable to that of Ertekin *et al.* [7]. However, Rodriguez *et al.* report an average age of 28 years [8]. In general, this phenomenon concerns all age groups, with a slight predominance among young adults and adolescents. This could be explained by the disturbed socio-emotional context associated with an impulsive, thoughtless personality, all of which leads to the act. The predominance of these accidents in humans has also been noted by Zargar *et al.* [9]. However, several studies show a strong female predominance [7] [8] [10]. This could be explained by the fact that the context of ingestion of caustics is often voluntary, with suicidal intent. The personality of women, often more sensitive and fragile

than men, seems to expose them more to suicide attempts for various reasons. The ingestion of caustic is sometimes integrated into adults as part of a known or unknown psychiatric condition, which is not available for treatment or medical follow-up. In our series, few patients had a known psychiatric past. Our results are weaker than those reported in the literature [5].

Indeed, the particular psychiatric context may be voluntarily hidden by some patients who feel a kind of "shame" about it. On the other hand, some psychiatric conditions can go unnoticed until they are completely decompensated. These reasons may be the origin of an underestimation of psychiatric disorders.

The ingestion of caustic was suicidal in the majority of our patients. Our results are similar to those of other authors [5]. Indeed, it can be a real psychiatric condition, either by an impulsive act in patients who do not really want to die and are unaware of the seriousness of their act, in the context of psycho-affective immaturity or in crisis situations (family or marital conflicts, professional problems, etc.). Sometimes, for some people, this gesture marks the beginning of a serious psychiatric illness.

The ingestion of sulphuric acid was more frequent in our study. This result can be explained by the easy accessibility of this caustic, and its daily use in households. Our study stands out from the other European series that follow the "French habit" described by M. Celerier, namely, in descending order of frequency: bleach, hydrochloric acid, ammonia and then hydrochloric acid [11] [12]. The time taken to admit admission is longer than that reported by other authors, by a few hours [8] [13]. This delay is explained by the weakness of our health system in the referral of patients, the lack of financial means, the absence of health insurance and the non-existence, if not the dilapidation of the urban and peri-urban road network because the remoteness and or isolation of certain geographical areas are at the origin of this delay. The initial symptoms and signs are extremely variable depending on the type and quantity of product ingested, as well as the time taken to manage compared to ingestion [12]. In general, there is no parallelism between the severity of caustic lesions and the existence of these signs unless they persist or worsen [14]. These clinical manifestations are progressive, and the clinical picture may be different depending on the time of the examination. The symptoms in our series are similar to those found by Chitinad Havanond *et al.* [15]. Upper gastrointestinal endoscopy should preferably be performed between the third and sixth hour [16]. Contrary to the recommendations, in our series, upper gastrointestinal endoscopy (EDH) was performed most often after a delay of more than 24 hours. This long delay is explained by the fact that the examinations are carried out at the expense of the patients, most of whom are destitute. Depending on the time of the incident, HRE may not be able to be carried out urgently in our context. Medical treatment was prescribed to all patients in our study. Resting the digestive tract was the rule in all patients. All authors are unanimous in prohibiting certain gestures, such as the consumption of water or milk [17]-[19]. Stopping oral feeding makes it necessary to resort to artificial nutrition, especially if the

fasting period is prolonged. It was performed in the majority of patients and initiated immediately after admission to the emergency department. No emergency surgical treatment was carried out due to a lack of financial means and the appropriate technical platform. Some of our patients have had surgery. The surgical treatment concerned the after-effects and repairs. The low frequency of jejunostomy in our study is justified by the lack of technical facilities in the hospital and the poverty of the patients. Evolutionarily, nearly half of our patients have experienced stenosis. Our results could be explained by the fact that stage IIb was the dominant stage in our study, and the literature states that patients with stage IIb digestive lesions secondarily develop stenosis in 40% to 70% of cases in the absence of excision [20]. This could also be explained by the lack of an adequate technical platform in our context. Indeed, the majority of healthcare facilities in Congo are under-equipped, and there is no healthcare facility capable of performing quality plastic surgery. However, Paris and Poncet reported lower frequencies than ours, 32% and 9% respectively [19] [21]. Caustic ingestions are grafted with immediate mortality and morbidity and are sometimes delayed. In the literature, the mortality rate varies depending on whether the cases are seen early [19] [21], or severe forms [22] [23]. Our results are twice as high as those reported by Ertékin [7]. However, they are close to those reported by Chirica *et al.* [5]. This is explained by the lack of an adequate technical platform for the management of caustic ingestions.

5. Conclusions

Caustic lesions are relatively common in our context. The caustic most incriminated is sulphuric acid. The lesions resulting from the ingestion of caustic products are serious and concern young subjects. The time taken to be admitted to the hospital is long, which explains the late performance of the upper gastrointestinal endoscopy. Lesions of grade greater than or equal to IIa progress to stenosis. Emergency surgical treatment of severe caustic lesions is not available in our country. A therapeutic approach based on resting the digestive tract with parenteral nutrition and close monitoring seems to be a good alternative.

The provision of adequate equipment for the management of caustic ingestions is necessary to improve the prognosis of patients.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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