



Original Article

Long term evolution of caustic induced esophagitis: A descriptive 20-years cohort.

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Abstract:

Introduction:

Corrosive esophagitis following caustic agent ingestion remains a significant medical and social concern in Tunisia. Secondary stricture is the most challenging complication. The aim of this study is to determine the incidence of caustic esophageal injuries and to highlight the characteristics of the management.

Methods:

Over a 20 years period, we conducted a retrospective and descriptive study about 164 consecutive patients presented to our department following ingestion of caustic agents.

Results:

The mean age was 26 years (16-87) with a gender ratio of 0.2. The ingestion was accidental in 58% of cases and as a suicidal attempt in 42%. Bleach largely dominates ingested solutions in 78.3 % of cases. The delay of the consultation was less than 12 hours in 98.4% of cases. We noticed gravity signs in eight patients. Lesions in Esophagoscopy were recorded in 62 patients (37.8%). The esophageal injury assessed as grade I in 36 patients, grade IIa limited lesions in 10 patients, grade IIa extensive in 8 patients, grade IIb in 5 patients and grade III in 3 patients. During the follow-up, 26 patients (41.9%) had a second assessment during the secondary stage, only 4 patients (2.4%) presented esophageal strictures. Three patients underwent coloplasty for esophageal replacement.

Conclusion:

During a 20-year period, 164 cases of caustic ingestion were reported. Constituted esophagitis injuries were noted in 37.8% and strictures in 6.45% of all cases.

Key words: Incidence, caustic agents, stricture, esophagus, Tunisia

Introduction

Ingestion of corrosive caustic substances remains a public health issue. Caustic injury is more common in children due to accidental ingestion [1]. In adults, ingestion occurs mostly for a suicidal purpose that increase the gravity. These corrosive substances may cause serious injuries in the esophagus. Prognosis is essentially related either to early septic complications or late sequelae [2]. The most challenging early complication is the esophagus necrosis. The main purpose of the initial assessment is to detect features predicting the transmural necrosis [3]. The major secondary consequence is esophageal strictures. Surgery may be required at any stage of the evolution. Hereby, we report our experience in caustic esophagitis management.

Patients and methods

We conducted a 20 years retrospective cohort study of consecutive patients admitted to our Surgical Department following caustic agent ingestion (1999-2018). We recorded the age, gender, the ingested substance's nature and the circumstances of ingestion. The data of the first assessment including clinical, biological, radiological and endoscopic findings was collected for each patient. A descriptive analysis of the second and third patient's assessments details was performed. The outcome of the endoscopic and surgical procedures was noted.

Results

Systematic eso-gastroscopy was done for all the patients. esophageal injury was found in 62 patients (37.8%). Clinical features of these patients were reported in Table 1. Female predominance with sex ratio of 0.2 was noted. Accidental ingestion presented in 58% and suicidal attempt in 42%. The most common reasons were school failure and family conflicts.

Table 1: Clinical features of patients with an esophageal caustic injury.

Variable	n
Age (years)	
Mean	26
range	16-87
Gender ratio	0.2
M	12
F	50
Circumstances	
Suicide attempt (%)	26(42)
Accident (%)	36(58)

Bleach was the most common ingested solutions (78.3%). The ingested substances were liquid in all cases. The consultation delay was < 12 hours in 98.4% of cases. All the patients did not present symptoms suggesting digestive perforation (abdominal contracture or cervical subcutaneous emphysema). We noticed agitation in seven patients and haematemesis in one patient. Esophagoscopy was systematically performed with no iatrogenic complications. The endoscopy was performed within less than 12 hours in 35 patients, between 12 and 24 hours in 105 patients and more than 24 hours in 24 patients. During endoscopy, Esophageal lesions were recorded in 62 patients (table 2,3).

Table 2: Endoscopic classification of caustic injuries (modified Di Costanzo [8])

Grade	Features
Grade 0	Normal
Grade I	Superficial mucosal edema and erythema
Grade IIa limited	Superficial erosions, non-confluent, number < 5
Grade IIa extensive	Confluent circular ulcerations, extensive, number >5
Grade IIb	Circumferential confluent ulcerations, hemorrhage, punctiform necrosis
Grade III	Extensive necrosis and important haemorrhage
Grade IV	Total mucosal carbonization, perforation

Grade 0 and grade1 patients were monitored for 24 hours and discharged with proton pump inhibitor for one week. Grade IIa limited lesions were recorded in 10 patients (16.1%). They were allowed to have oral diet after 48 hours. Grade IIa extensive was found in eight patients (12.9%), grade IIb in five patients (8%) and grade III in three patients (4.8%). These patients were kept NPO with exclusive parenteral nutrition.

The intravenous intake was performed during 12 to 14 days for eight patients (grade IIa) and for 20 to 25 days for the eight patients (grade IIb or III). No patients had grade IV endoscopic lesions.

During the follow-up, 26 patients (41.9%) underwent an assessment during the second stage. Only four patients (6.45%) developed esophageal strictures. Surgical repair of these delayed associated lesions was required in three cases. These patients underwent esophageal replacement. No treatment-related death was recorded in our in our study.

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Table 3: Distribution of caustic substances according to their nature and esophageal injury

Caustic agent	n (%)	Esophageal injury	Endoscopic findings					
			G _I	G _{IIa L}	G _{IIa E}	G _{IIb}	G _{III}	
Oxidant	Bleach	127 (78.3)	42 (33%)	28	6	4	3	1
	H ₂ O ₂	1	1	1				
Alkaline	Sodium bicarbonate	14 (8.6)	13 (92.8%)	5	3	2	1	2
Acidic	Hydrocholeretic acid	6	4 (66%)	2	1	1		
Others		14 (8.6)	2 (14.2%)	1	1			

Table 4: evolution and management

Case	Stricture diagnosis (months)	Endoscopy findings	mucosa	Gswallow findings	Endoscopic treatment	Procedure	Post-operative
1 st	9	Stricture of the upper esophageal sphincter	Adhesions of the hypopharynx	Interrupted examination due to inhalation	Four endoscopic release	Coloplasty was performed after 20 months	Hypersalivation and total dysphasia evoking anastomotic stricture managed with endoscopic dilatation
2 nd	6	Punctiform impenetrable stricture at 26 cm from dental arches	Inflammatory	Stricture of the esophageal lower third of 15 cm length		Peristaltic coloplasty	transverse Uneventful
3 ^d	8	Stricture of the upper esophageal sphincter	Normal	Multiple stricture of the esophagus	Multiple endoscopic dilatation	Patient has refused surgery	
4 th	5	Tight stricture at 27 cm from dental arches	Inflammatory	Stricture of the esophageal middle third at 27 cm from dental arches		Eso-coloplasty with antral resection	Systemic candidiasis 7 months after surgery

Discussion

Caustic ingestion is a life-threatening incident. It may lead to esophageal perforation [4]. Survivors to initial fatal complications may have esophageal stricture. This is more frequent in children than adults. In our study, the mean age was 26 years. The majority of adult caustic esophagitis studies showed female predominance. However, pediatric studies showed male predominance [5,6]. This ingestion is mostly accidental for children and voluntary for suicidal intent for adults [7]. One hundred sixteen out of our patients presented a favorable outcome with no sequelae (97%). Di Constanzo [8] and Andreoni [9] respectively reported that the healing rates without sequelae were 80% and 84% of patients. This can be explained by the large predominance of diluted bleach over other ingested agents.

This was concordant with the previous report with domestic caustic substances which cause severe problems [10]. Few studies had focused on predictive factors for esophageal stricture after caustic ingestion. High BMI, suicidal intent, initial severe clinical presentation, hemostasis troubles, endoscopic grade and some agents' characteristics (extreme pH values, alkaline agents, volume and concentration) were the most reported factors correlated with a high risk of esophageal stricture. Major esophageal injury series in adults demonstrated that alkaline substances are more harmful than acids. Acids cause coagulation necrosis while the alkaline agents combine with tissue proteins and lead to vessels thrombosis that decrease the blood supply of already

damaged organs. This may be also explained also by the higher viscosity and a longer contact time with the esophagus mucosa [11,12]. In our study, ingestion of alkaline agents was almost constantly associated with esophageal injuries and led to 3 of the four diagnosed stricture cases. Clinical features depend on the type of the substance, amount, physical form and delay of consultation [13]. The laboratory studies are more useful in monitoring and guiding patient management than in predicting esophageal injury. Esophagoscopy is the most fundamental examination of the initial assessment and the cornerstone of management of caustic injuries. It provides an appraisal of topography, extension and significance of lesions [14]. The best time for endoscopy is between the 3rd and 24th hours after ingestion. It must be performed whenever caustic ingestion is certain or strongly suspected as soon as hemodynamic and psychiatric stabilization have been achieved. Endoscopic classification is important for the management and prognosis assessment. The endoscopic degree of esophageal injury is an accurate predictive factor of systemic complications and mortality [15,16]. Currently, Computed tomography (CT) has become widely indicated in caustic injuries specially in severe clinical presentation [17]. CT scan is effective in the early evaluation of caustic damage. It offers more detailed evaluation than endoscopy about the esophageal transmural lesions and the extent of necrosis [18]. Regarding secondary complications, the incidence of esophageal stricture varies widely. A rate of 5% to 75% was reported. This can be due to an unclear definition of stricture in many reports, heterogeneity of corrosive substances and variable delay to stricture diagnosis. In our study, the stricture rate was 2.4%. This low incidence can be explained by the large predominance of diluted bleach ingestion (78.3%). Tight esophageal stricture, multifocal or extensive and irregular lesions, requires esophagoplasty [19]. This was the case in three patients in our study after the failure of the endoscopic option. Reconstructive surgery is indicated firsthand in patients of multifocal stricture, in children, in case of the tracheoesophageal fistula with recurrent respiratory infection [20]. Our limitations in this work were the retrospective description and some missing follow up data.

Conclusions

Caustic ingestions remain a life-threatening accident. Fortunately, most ingestions are benign, especially in case of accidental ingestion. The main purpose of clinical and biological assessments is to detect gravity features predicting transmural necrosis. A digestive stricture is the most challenging secondary complication. Currently, there is no preventive treatment for esophageal stricture following corrosive ingestion in the adult. The predictive factors remain a subject of research and debate.

Conflict of interest: none

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