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## ***Our experiences in coloplasty for caustic oesophageal stenosis: about 11 observations.***

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### **Abstract**

**Purpose:** Describe surgical management of caustic oesophageal stenosis, in the Thoracic and Visceral Surgery Units of the University Hospital of Antananarivo Madagascar.

**Methods:** It is a prospective descriptive study, about 3 years from January the 1st 2014 till December the 31st 2016. This study includes the first year evolution of each case. Were included all patients of at least 15 years old and underwent surgery for oesophageal caustic stenosis. The mean of postoperative length of surveillances was 22.09 months. **Results:** Eleven patients were colliged. The sex ratio was 4.5. Median of ages was 37 years old. The caustic burn was voluntary in 8 patients. Acid was the most incriminated substance. Oesophagectomy with oesophageal coloplasty in retrosternal without thoracotomy was performed in 9 patients and by thoracotomy to 2 others.

Were noted in postoperative period: 2 cases of stenotic recurrence, 2 deaths and one case of cervical anastomotic fistula requiring revision. **Conclusion:** Incidences of caustic oesophageal stenosis increase in Madagascar. Surgery is heavy and invasive but it remains the main option till endoscopic dilatation is not available. The postoperative results is often precarious because of prolonged delay of the curative surgery in the nonpermissive economic local context.

**Keywords:** Adult, Oesophageal coloplasty, Oesophagoplasty, Caustic oesophageal stenosis

### **Introduction**

The ingestion of caustic substance can destroy more or less the digestive tract tissues with which they come in contact because of their pH or their oxidizing power. This incidence is currently increasing in developing countries. Complications are various and often heavy, requiring multidisciplinary care. We propose to describe and to discuss our experiments on the surgical management of caustic esophageal strictures in a low-resource country.

### **Methods**

This is a descriptive and monocentric study carried out over three years (January 1st 2014 to December 31st 2016). It was performed in the thoracic and visceral surgery department of the Joseph Ravoahangy Andrianavalona University Hospital Center (CHU-JRA) in Tananarive (Madagascar).

Were included all patients aged 15 years and older, with digestive disorders such as dysphagia or aphagia on caustic esophageal stenosis, which was confirmed by upper gastrointestinal endoscopy and surgically treated with oesophageal coloplasty. Were excluded from our study non-caustic oesophageal stenoses, unoperated esophageal stenosis or ENT lesions. The epidemiological characteristics of our study population, the diagnostic aspects of the caustic esophageal stenosis, the modalities of surgical management and their after-effects profile were described. Patients were distributed according to the type of surgical procedure. The data was recorded and processed on the Excel file.

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## Results

The circumstances of occurrence were accidental in 3 patients (27.27%) and volunteers in a suicide attempt in 8 patients (72.73%). 11 patients with caustic esophageal strictures among 1497 adult patients hospitalized in the thoracic and visceral surgery department were included (0.74%). There were 9 men (81.82% of cases) and 2 women (18.18% of cases), with a sex ratio of 4,5. The median age of the patients was 37 years, with extremes of 24 and 50 years. The frequency peak was in the 35 to 45 age group (54.55%). The circumstances surrounding the accident were accidental in 3 patients (27.27%) and volunteers in a suicide attempt in 8 patients (72.73%). The lesions were caused by acidic substances in 6 cases (54.54%) and by basic substances in 2 cases (36.36%). The nature of the product was undetermined in 3 cases (27.27%). The average consultation time was 14.16 days with extremes of 2 to 37 days. And the average time between ingestion and surgery was 3.7 months. Among the clinical signs presented at admission were deglutition disorder in all patients but with variable severity and collective weight loss with an average weight loss of 12.13 kg (Table I). All patients performed upper gastrointestinal fibroscopy and oesogastroduodenal transit (TOGD or TDM with water-soluble digestive markers) to confirm the diagnosis of the stenosis and to determine their severity. The surgical indication was based on the site and extent of the stenosis observed during endoscopy and radiology. An impassable tight stenosis was found in 8 patients (72.72%), and staged esophageal stenosis in 7 patients (63.64%). Besides, we noted 2 cases of esophageal perforations (18.18%) and the failure of the endoscopic dilatation was the motive for the surgical indication in 4 patients (36.36%). Esophagectomy with retro-sternal esophageal coloplasty without thoracotomy was then performed in 9 patients (81.82%) (Group A). In the other 2 patients, the surgical procedure consisted of esophagectomy with esophageal coloplasty by thoracotomy (18.18%) (Group B).

For reasons pecuniary, a feeding jejunostomy was previously prepared in 7 severely undernourished patients (63,64%) looking forward to the curative surgical operation. After the operation were noted 2 cases of mediastinitis (18.18%) and one case of tracheoesophageal fistula (9.09%). The short-term complications of retrosternal esophagoplasty (Group A) was 2 cases of cervical fistula (22.22%), and thoracic empyema in another (11, 11%) ; while one of the two patients with thoracotomy mediastinal esophagoplasty (Group B) observed necrosis of his transplant. Other than, one patient from each group died following septic shock. In the medium term, in patients who did not undergo thoracotomy (Group A) were observed : 5 cases of gastroesophageal reflux (55.56%) and 2 cases of anastomotic stenosis (22.22%); while one of the patients with posterior mediastinal esophagoplasty (Group B) noted esophageal reflux (Table II).

## Discussion

Esophageal stricture is the main long-term complication of caustic ingestion and it is observed in 20 to 40% of cases and the occurrence depend on the severity of the initial esophageal lesion [1]. Young adults aged 25 to 45 are the most concerned [2,3]. Our study found a median age of 37 explained by the young age of the Malagasy people. The male predominance is noted by the authors and justified by the frequency of attempted suicide in men [2,4]. In fact, Hao-Tsai Cheng et al reported 71.06% voluntary ingestions of caustic (n = 194) [3]. A Macedonian study also found 95% of suicide cases [5]. In developed countries, accidental ingestion of caustic is less common, estimated between 23 and 29%, and favored by acute ethyl intoxication, painkillers and drugs [6]. Our study corroborated data in the literature by reporting 81.82% of males and 72,73 % of voluntary biting ingestions in a suicidal purpose. The biting products in cause are mainly acids and strong mineral bases [7]. In 8 in 17 % of the cases, acids pull an esophageal stenosis; whereas bases, even in small quantity, can pull serious injuries and quickly mortal [8,9]. Our series recorded the predominance of esophageal strictures of acid origin at 63.64%.

Esophageal stenosis becomes symptomatic 2 to 3 weeks after caustic substance ingestion with quasi constant weight loss and dysphagia of variable severity [9]. In case of oesophageal perforating, mediastinitis is the main complication and is often revealed by continuous and intense retrosternal pain radiating to the back, rarely by the Mackler triad associating vomiting, chest pain and subcutaneous emphysema [10].

Furthermore, vast hurts can be complicated by septic shock [11]. All of our patients observed weight loss, 81,82% had severe dysphagia and 18.18% had esophageal perforation.

Confirmation and appreciation of the characteristics of oesophageal stenosis and associated lesions are primarily related to upper gastrointestinal endoscopy and opaque transit. According to the literature, esophageal caustic stenosis is long, tortuous and multiple, and tight stenosis is the most common [12]. In our work, we found 72.73% tight stenosis and 63.64% multiple and staged esophageal stenosis. The radiography of the chest is relevant in search of associated complications such as mediastinitis secondary to oesophageal perforation, which is raised in front of mediastinal enlargement and images of gaseous and / or fluid mediastinal collections [13]. As for the chest scanner, its interest is limited to the early diagnosis of mediastinitis, the decision of emergency esophagectomy for the grade 3b esophageal stenosis, the choice of surgical approach and to the postoperative monitoring [14]. Endoscopic dilatation with a candle bougie or balloon, repeated every 2 to 3 months, is the first-line treatment, possibly accompanied by a paretoscopic incision for short and tight stenosis [12,14]. At the severely undernourished patients, retrograde endoscopic dilatation through feeding gastrostomy is an option [12]. Early dilatation gives better results with a risk of recurrence of 30% and 3.2% of deaths, and late dilatation is associated

With recurrence in 72% of cases and death in 4% of cases [15]. In case of failure, the placement of expandable prosthesis is an alternative [12]. None of our patients had endoscopic dilatation or prosthesis placement. These techniques are not yet available in our Center. Surgery based on esophageal replacement is the rule for complete stenosis, esophageal perforation or fistula, and refractory stenosis [14]. Several techniques are proposed, such as esophagectomy by stripping, right thoracotomy esophagectomy with pulmonary or muscle flap making, or anterior or retrosternal oesophagoplasty with gastric tubulation or colonic transplantation [16]. Esophagectomy is a heavy surgery with severe and fatal complications. Anastomotic fistula is the most feared, especially after trans-hiatal esophagectomy [17]. Chylothorax could also occur with an incidence varying from 1 to 5% [17]. Besides, the complications of esophageal coloplasty are dominated by anastomotic stenosis, gastro-colic reflux, late postoperative occlusion, and ischemia with transplant necrosis, which were found in our series. The mortality of coloplasty is estimated at 20.5% for the anterosternal way, 25% for the retrosternal way and 50% in the posterior mediastinum, and related to the occurrence of mediastinitis and pneumothorax, secondary to an intra-thoracic anastomotic fistula. [18,19]. In our study, both immediate postoperative deaths were secondary to septic shock. For non-surgically treated caustic lesions, long-term endoscopic monitoring, every one to three years for 15 to 20 years, is recommended by ASGE and SFED because of the risk of developing 1000-fold higher estimated squamous cell carcinoma. to that found in the general population, with an incidence ranging from 2.3 to 6.2% [4,20]. The small number of our study population and the monocentricity of the study do not allow to determine in an exhaustive surgical reality of caustic esophageal stenosis in our country. However, this study made it possible to emit preliminary results of our therapeutic strategy of caustic oesophageal stenoses.



### **Conclusion**

The caustic stenosis of the esophagus in adults is frequent and serious, and it is mainly due to a voluntary act. The recommended treatment is endoscopic dilatation which is still not available in our context, requiring the use of heavy and invasive surgery based on esophagoplasty. As a result, the ingestion of caustic expose to a considerable morbimortality and the sensitization of the population on the dangers of these substances seem essential. Furthermore, the multidisciplinary care, especially the collaboration of endoscopists, would be desirable to reduce the morbidity and mortality of this pathology.

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### **DECLARATION OF INTEREST**

The authors declare that they have no conflicts of interest in relation to this article.

**Table I :** Distribution of the signs presented by patients at admission

Clinical signs at admission	Effective (N = 11)	Percentage
Thinning	11	100,00
Hypersialorrhea	9	81,82
Aphagia	7	63,64
Dysphagia	4	36,36

**Table II:** Distribution of morbidity-mortalities of patients after surgery

Complications	Group A (N = 9)		Group B (N = 2)	
	Effective	Percentage	Effective	Percentage
<b>Short terme</b>				
Cervical fistula	2	22,22	0	0
Transplant necrosis	0	0	1	50,00
Chest empyema	1	11,11	0	0
Death	1	11,11	1	50,00
<b>Medium term</b>				
Gastroesophageal reflux	5	55,56	1	50,00
Crops	3	33,33	0	0
Anastomotic stenosis	2	22,22	0	0
Nutritional autonomy	9	100,00	2	100,00

**Group A :** Esophagectomy with retrosternal coloplasty without thoracotomy.

**Group B :** Esophagectomy with posterior mediastinal coloplasty using thoracotomy.

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