GASTRIC OUTLET OBSTRUCTION BY CAUSTIC INGESTION: CASE REPORT OF AN EARLY DEFINITIVE SURGICAL APPROACH

OBSTRUÇÃO À DRENAGEM GÁSTRICA POR INGESTÃO DE CÁUSTICO: UM CASO DE TRATAMENTO CIRÚRGICO DEFINITIVO PRECOCE

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ABSTRACT

Introduction: Ingestion of caustic products present a challenge to many physicians, as it remains a rare occurrence in the emergency room. **Presentation of Case:** A 58-year-old male was brought to the emergency department after ingesting hydrochloric acid. A pre-pyloric stenosis developed and endoscopic dilation was attempted with no success. The patient underwent an open subtotal gastrectomy after 4 weeks, with no complications and significant clinical improvement. **Discussion:** Gastric outlet obstruction mainly occurs in the prepyloric area. A surgical approach is reported as a safe alternative after the acute inflammatory phase subsided, and can be safely executed 4 weeks after the caustic ingestion if needed. The type of resection should be tailored to the extent of the lesions. **Conclusion:** Surgical resection poses a safe alternative, after the acute inflammatory phase has subsided and allows for adequate symptomatic control. Liquid agents affect mostly areas where pooling occurs, being the gastric antrum a frequent area where caustic lesions take place.

Keywords: *Caustic ingestion; Pyloric stenosis; Gastric outlet obstruction; Gastrectomy.*

RESUMO

Introdução: A ingestão de produtos cáusticos representa um desafio terapêutico para várias especialidades por permanecer uma entidade rara nos serviços de urgência. **Apresentação do Caso:** Um doente do sexo masculino, com 58 anos de idade deu entrada na sala de emergência após ingestão de ácido clorídrico. Posteriormente, desenvolveu uma estenose pré-pilórica que foi submetida a dilatação endoscópica, sem sucesso. O doente foi submetido a uma gastrectomia subtotal por via aberta após 4 semanas, que decorreu sem complicações e melhoria clinica significativa no pós-operatório. **Discussão:** A obstrução à drenagem gástrica ocorre sobretudo na região pré-pilórica. Uma abordagem cirúrgica é considerada uma opção eficaz após a fase inflamatória, e pode também ser executada de forma segura precocemente quando necessário, devendo ser o tipo de resseção adaptado à extensão das lesões. **Conclusão:** A resseção gástrica representa uma alternativa segura precocemente após o início da fase inflamatória e permite um adequado controlo sintomático. Cáusticos na forma líquida afetam principalmente em zonas de acumulação, sendo o antro gástrico uma área onde as lesões cáusticas são frequentes.

Palavras-chave: *Ingestão de cáustico; Estenose pilórica; Obstrução à drenagem gástrica; Gastrectomia.*

INTRODUCTION

Ingestion of caustic products present a challenge to many physicians, as it remains a rare occurrence in the emergency room. Lack of expertise managing these patients is very common and a multidisciplinary approach is often required.[1,2,3]

Ingestion of corrosive agents is known to have a bimodal age distribution, where the majority of caustic ingestions occur in children by accident, and others involve adults, mostly women, with psychiatric background.[1,4,5,6,7] According to several international poison control centers, human exposures with less serious outcomes have decreased while more serious outcomes (from moderate severity to death) have increased.[8] The most frequent agent reported is bleach, followed by acids and alkalis.[1] The lattest is the most common agent found in caustic ingestions in Europe.[1,4]

PRESENTATION OF CASE

A 58-year-old male was brought to the emergency department, after being found on the floor, lethargic but still responsive, holding a recipient of hydrochloric and muriatic acid. Past medical history included uncontrolled hypertension, obesity, an appendectomy and an hemorrhoidectomy.

On site, he was conscious, hemodynamically stable, with his oral cavity and tongue noticeably burnt. Airway patency was carefully monitored, and a nasogastric tube was placed with immediate drainage of dark brown gastric content. An urgent endoscopy was performed, describing several erosions, the deepest along the Z line. The gastric mucosa was coated with hematin (Fig. 1) and several superficial ulcers were identified, reaching the duodenum.

A second endoscopy was performed 2 days later. The esophageal mucosa was friable but the lumen remained patent. Alimentary stasis content was found, along with fibrous residue. The antrum and prepyloric mucosa were described as exudative, with an evident pyloric substenosis. (Fig. 2)

The patient was discharged tolerating a soft diet. One month later, he was readmitted for persistent vomiting. A jejunal feeding tube was inserted but not tolerated. Another endoscopy was performed to dilate the stenosis. The report mentioned a slight

Fig. 1 – **Endoscopy performed in the first 24h reporting a dark coating of the gastric mucosa.**

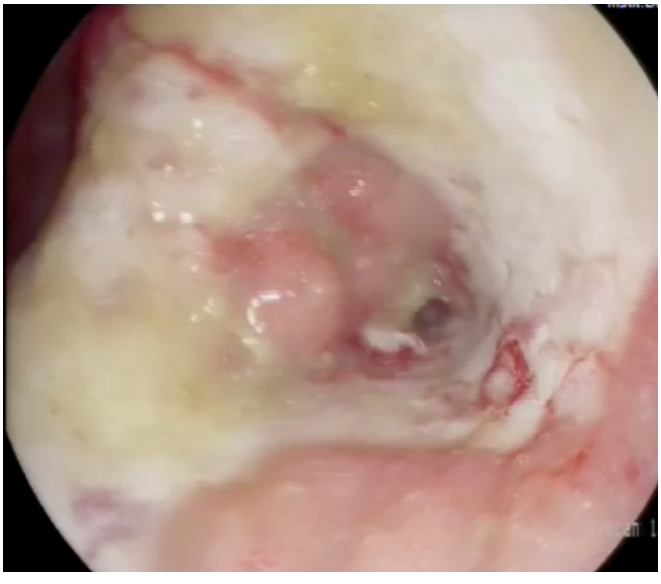

Fig. 2 – **Exudative lesions in the antrum and prepyloric area; Pyloric substenosis described on the second endoscopy.**

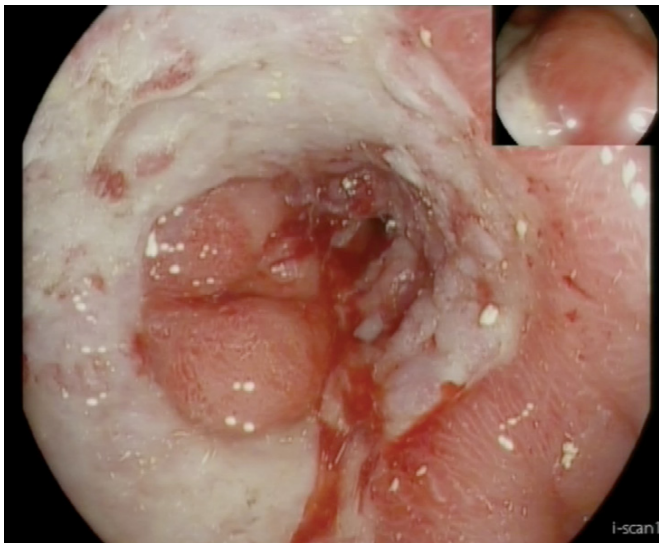

Fig. 3 – **Circumferential ulceration of the antrum with extension to the pylorus.**

erythematous and congestive esophageal mucosa in its distal portion with no evidence of ulcertative or stenotic segments, and showed circumferential ulceration of the antrum. The endoscope did not progress through the pylorus due to a severe fibrotic stenosis. (Fig. 3)

The best treatment approach was discussed in a multidisciplinary meeting. The patient remained symptomatic with persistent vomiting, so a temporary jejunostomy was proposed. However, the patient declined this option as it would affect his ability to work. It was then proposed a gastrectomy, whose extent would be determined intra-operatively depending on the magnitude of the lesion, the ability to determine its limits and taking into account the risk of gastroparesis and malignant transformation.

Based on the peroperatory evaluation of the gastric walls, the patient underwent an open subtotal gastrectomy with a Roux-en-Y reconstruction. A bilateral subcostal incision was made to improve exposure of the supramesocolic space. The gastric antrum wall was thickened and the pre-pyloric area was visibly stenotic (Fig. 4A). The resected specimen was sent to the pathology department for histologic examination. (Fig. 4B)

DISCUSSION

Ingestion of caustic products in the adult is uncommon, and the majority of times is intentional. Depending on the type of caustic agent, its physical form and quantity ingested, the physiological impact can range from local mucosal damage, transmural affection, to a systemic inflammatory response

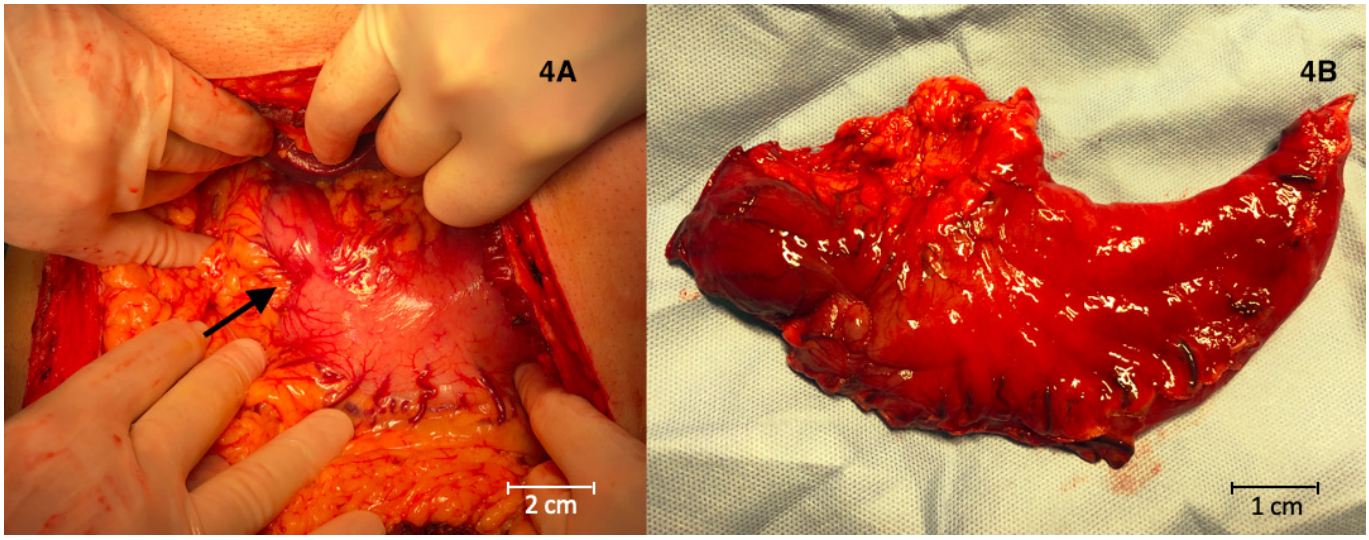

Fig. 4 – **A – Visible pre-pyloric stenosis (arrow); B – Resected specimen.**

syndrome, sepsis, and multi organ dysfunction. Solid agents tend to affect mostly the oral cavity and pharynx, while liquids rapidly progress to the stomach, where they pool and cause most of the damage to the gastric wall. When concomitant vapor inhalation occurs, airway burns might coexist.

Acids mostly lead to coagulative necrosis, which tends to cause more localized damage and less tissue penetration to the viscera wall. The pooling effect that occurs due to pyloric contraction is responsible for the stomachs' major involvement. Alkalis agents, however, produce liquefactive necrosis, which rapidly progresses to a major inflammatory response and results in immediately severe injuries at all levels of the gastrointestinal tract.

In the case reported, the caustic agent was hydrochloric and muriatic acid in its liquid form. The gastric lesions were in accordance with the pathophysiology of the caustic agent described.[4]

Upon admission, the oropharyngeal injury required close monitoring of the airway patency as rapid desaturation due to caustic damage to the tracheobronchial tree could have compromised respiratory function. Around 10% of laryngeal caustic injuries require intubation, which was not necessary in the case reported.[1,2,5,6] Regarding the systemic repercussions, it did not impact severely other organs as routine laboratory blood and urine tests were within normal limits.

Currently, the cornerstone of the diagnosis is the esophagogastroduodenoscopy, although ultrasound and Computed Tomography (CT) are quickly gaining a more significant role as they allow for a better understanding of the esophageal and gastric wall compromise.[4,10,7] It does not, however, replace an early endoscopy.[1,9,6] Given the fact that the lesions were well documented on endoscopy, along with no systemic repercussions found, in the presented case, undergoing a CT would not have any implications concerning intraoperative decision making. Hence, a CT imaging study was not requested.

Caustic lesions are characterized using the Zargar endoscopic classification, that ranges from grade 1, consisting of edema and erythema, to grade 3b, extensive necrosis.[10] Our patient was initially classified as an, at least, Grade IIa, which describes a friable, hemorrhagic, and erosionated mucosa, with white membranes, exudates and superficial ulcerations.

Stricture formation, although uncommon in the stomach because of its large diameter, is the most common late complication.[1] According to some authors, strictures tend to develop between 8 weeks and 3 months (to 1 year).[1,6] Our patient, however, had clinically relevant obstruction within 3 weeks after ingestion.

There are no established guidelines concerning treatment. Many surgeons consider early surgery a bold approach during the first 3 months due to ongoing inflammation, and rely on sequential endoscopic dilations to treat complications.[1,5] On the other hand, various authors agree that a surgical approach is the treatment of choice. A feeding jejunostomy was first proposed while waiting for the acute phase to subside. However, the patient declined this option as it would interfere with his ability to work. Instead, he underwent an open subtotal gastrectomy, which is the standard procedure of choice of many surgeons, as it allows for effective gastric outlet drainage. Moreover, it can reduce the long-term risk of malignant transformation.[11,12] Other surgical techniques that have been proved useful to treat gastric outlet obstructions are pyloroplasty and gastrojejunostomy. Both were considered for this patient, however, due to the extensive pyloric and antral fibrosis found intraoperatively and because of the worse functional outcome arising from an already dysfunctional gastric wall, they were immediately discarded. An acknowledged intraoperative challenge consists in outlining the limits of the lesion during gastric resection as they don't all reach the gastric serosa[4]. In such cases, an intraoperative endoscopy is of utmost importance as it poses a helpful tool to delineate non transparietal caustic lesions. In the reported case, an intraoperative endoscopy

was considered and would be performed if requested. However, the findings after laparotomy were unequivocal regarding the margins of the resection being the endoscopy a no longer required exam.

Despite the increased risk, because malignant transformation is insidious and rarely occurs, frequent endoscopic examination as follow-up is a relatively common alternative to surgery.[1,4,10,11,12]

CONCLUSION

Because of how rare these cases are, the under-reporting of caustic ingestions remains an issue as it makes it challenging to create an evidence based treatment guideline.

Airway patency represents an immediate concern as caustic damage to the oropharynx and tracheobroncheal tree might cause potentially life threatening desaturation with possible need for intubation.

Liquid agents affect mostly areas where pooling occurs, being the gastric antrum a frequent area where caustic lesions take place.

The standard of care for gastric caustic lesions are sequential endoscopies if a gastric outlet obstruction develops. Surgical resection poses a safe alternative, after the acute inflammatory phase has subsided and allows for adequate symptomatic control.

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