Muriatic acid: digestive exposure, case report and literature review

Nicolás Rocha, MD,[1] Diego Aponte, MD,[2] Rigoberto Montoya, MD.[2]

[1] Resident in Gastroenterology at the Clínica Universitaria Colombia in Bogotá, Colombia
[2] Gastroenterologist at the Clínica Universitaria Colombia in Bogotá, Colombia

Translation from Spanish to English by T.A. Zuur and The Language Workshop

Received: 02-02-11
Accepted: 11-10-11

Abstract
Digestive tract burns can create high levels of comorbidity in an exposed patient although these levels depend on the different capacities to cause harm of alkalis and acids. The ideal moment for endoscopy in these cases is currently being debated as a patient's post burn reactions may be devastating. We present the case of a patient who attempted to commit suicide by ingesting muriatic acid including clinical findings, complications and management.

Key words
Digestive burn, muriatic acid, endoscopy.

INTRODUCTION

The ingestion of caustics and poisoning caused by these substances are serious threats because of the devastating consequences they can produce. They are considered to be a serious medical and surgical problem due to the high rates of morbidity and mortality that ensues. Initial treatment and early endoscopy are fundamental in the management and for the prognoses of patients with caustic digestive tract burns.

We present the case of a patient who had attempted suicide and who had resulting secondary digestive burns caused by muriatic acid.

CLINICAL CASE

A 25 year old woman who had been healthy arrived at the intensive care unit because of heartburn and posterior abdominal pain following prior to attempted suicide by voluntary ingestion of muriatic acid. Upon admission the patient was in pain and experiencing tachycardia. She had mild epigastric pain but no signs of peritoneal irritation or other symptoms upon physical examination. The laboratory tests showed an important leukocyte reaction in the complete blood count. A chest x-ray and high digestive tract endoscopy were performed. The thorax x-ray showed no alterations, but endoscopy found evidence of III or IV degree burns on the Zargar scale in the esophagus and stomach (Figures 1, 2, 3 and 4). Since there was a high risk of perforation, it was decided not to use a nasogastric feeding tube, but to use parenteral nutrition instead.

During the patient´s subsequent evolution she presented hyporexia, emesis and constant nausea. Another endoscopy was performed which uncovered fibrosis scars in the antrum with serious retraction and secondary pyloric stenosis. The stenosis was treated with balloon dilation without complications leading to an improvement in her symptoms (Figures 5, 6, 7 and 8).

DISCUSSION

Although the epidemiology of these burns is not completely known, between 5,000 and 18,000 cases are reported each year in the USA (1). Accidental ingestion of caustic mate-

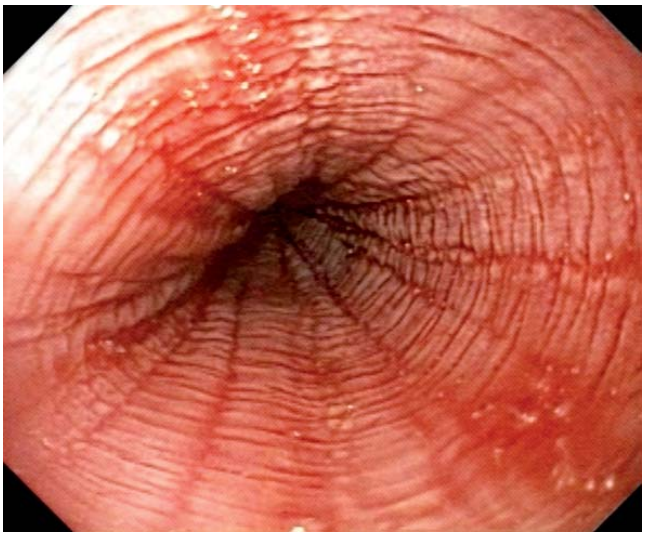

Figure 1. Esophagus with edema, erythema and friable membranes.

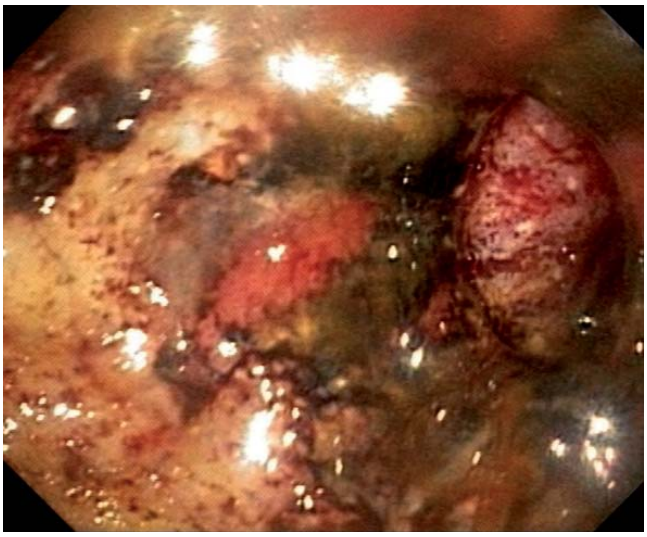

Figure 4. Antrum with extensive necrosis.

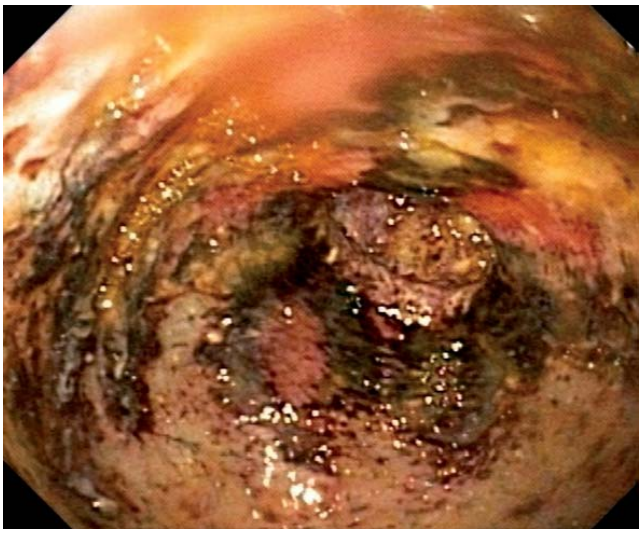

Figure 2. Antrum (Pale mucosa with fibrinoid necrotic material).

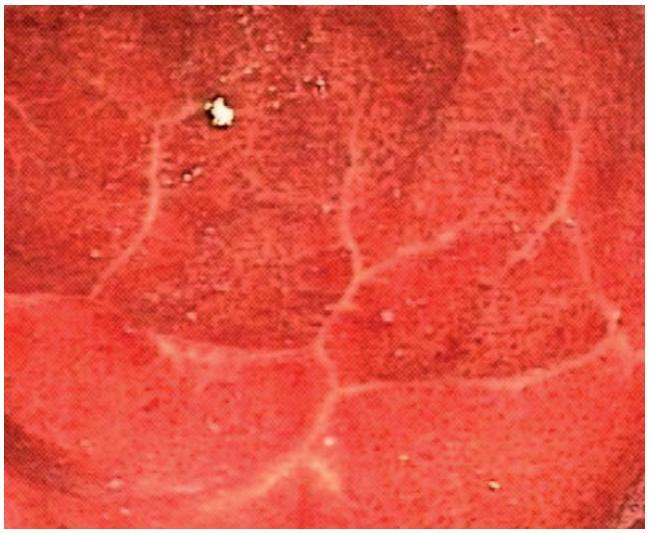

Figure 5. Band of scarring in antrum

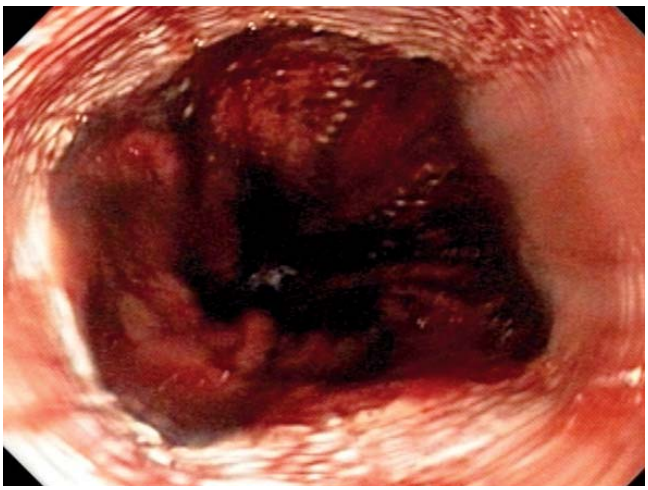

Figure 3. Gastroesophageal union with wide cardia.

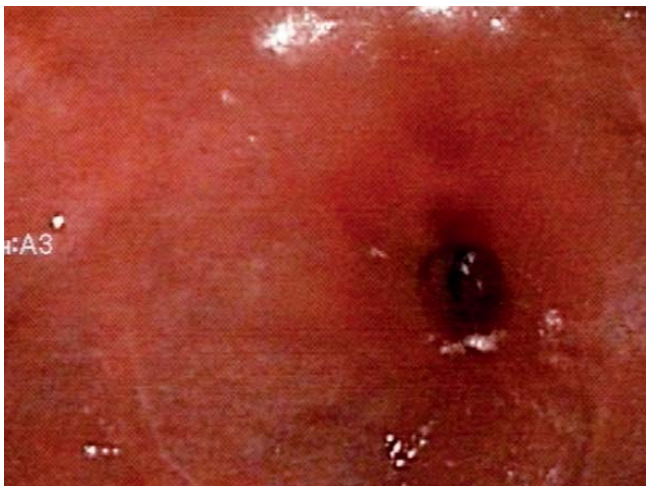

Figure 6. Pyloric stenosis

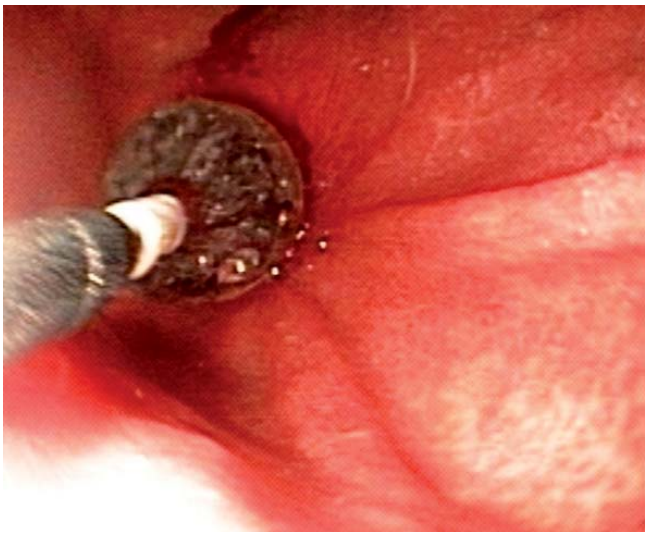

Figure 7. Balloon dilation

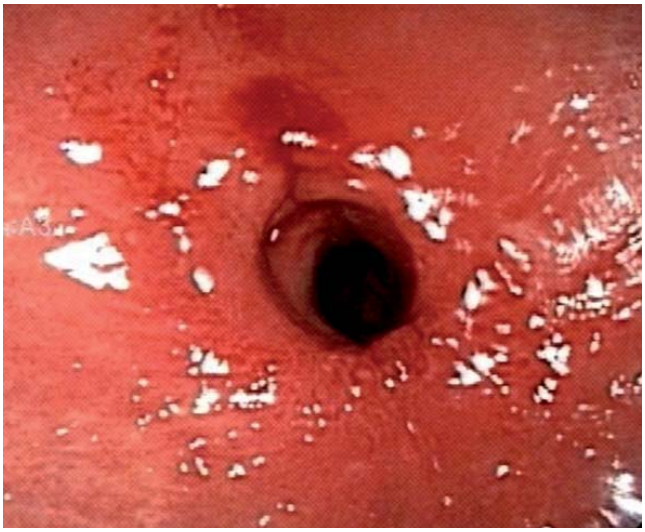

Figure 8. After balloon dilation

rials usually affects children while voluntary ingestion causes serious injuries in adults (2). Suicide attempts using caustics create very large alterations in the esophagus and stomach.

The pathophysiology of caustic burns caused by acid differs from that of burns caused by or alkalis. Acids generally cause coagulation necrosis which sometimes creates a protective barrier that can stop the lesion and its proliferation. In contrast, alkalis create liquefaction necrosis which destroys cellular membranes through saponification and thrombosis which worsen lesions and result in esophageal perforations and greater complications than those caused by acids (3).

Throughout history there have been different classification systems for this type of burns in order to optimize management of these patients. The type of management is determined by the degree of the lesion (Table 1).

Table 1. Endoscopic classification and management of lesions.

Endoscopic classification and management of lesions
O DEGREES: Normal / patient can ingest cold liquids.
FIRST DEGREE: Hyperemia or mucosal edema / temporary dysphagia, patient may ingest liquids after two days.
SECOND DEGREE: Ulceration IIa: Superficial ulcerations, patient may ingest liquids orally after 5 to 7 days depending on clinical examination. IIb: Circumferential ulceration: patient may ingest liquids orally after 5 to 7 days depending on clinical examination.
THIRD DEGREE: Necrosis IIIa: Small isolated area of necrosis, no oral ingestion for at least three weeks, endoscopic follow up IIIb: Extensive Necrosis, no oral ingestion for at least three weeks, endoscopic follow up

Zargar SA, Kochnar R, et al. Gastrointest Endosc 1991; 37:165-169.

Other complications that should be taken into account include basic life support, analgesics, mucous protectors (sucralfate), proton bomb inhibitors and anti H2. Although, there are no controlled studies regarding adequate and safe time for performance of endoscopy for this type of patients, the procedure should usually be performed as soon as possible between within the first 6 to 12 hours (4).

Antibiotics only play a useful role when there is perforation and the possibilities of complications and consequences. Treatment with steroids has shown no benefit (5).

These types of burns can generate long term sequelae due to stenotic lesions. They usually occur around the esophagus where about 70% of patients present dysphagia because of permanent lesions in which scarring fibrosis replaces muscular tissue of the enteric plexus (6). Once the acute episode is resolved, the treatment focuses on sequelae and late complications. It is also accepted that the sequelae in this type of patient increases the risk of esophageal cancer (both adenocarcinomas and squamous) (7).

The physical evolution of the patient studied was adequate, and she began to ingest tolerable liquids after parenteral nutrition.

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