

CASE IMAGE

A case of early gastric necrosis due to ingestion of an acidic toilet cleaner

Masaya Ushio 

Department of Acute Care Surgery,
Chiba Emergency Medical Center,
Chiba-shi, ChibaKen, Japan

Correspondence

Masaya Ushio, Department of Acute
Care Surgery, Chiba Emergency
Medical Center, 3-32-1 Isobe Mihama-
ku, Chiba-shi, ChibaKen, Japan.
Email: motosuka99@yahoo.co.jp

Key Clinical Message

A patient presenting to the emergency room with abdominal pain due to acidic cleaner ingestion, whether accidentally or intentionally, should undergo contrast-enhanced computed tomography (CT). If no abnormalities are noted on CT early after ingestion, the patient should be reviewed with a repeat CT within 3–6 h.

KEYWORDS

corrosive, hydrochloric acid, necrosis, surgery

1 | INTRODUCTION

Acidic toilet detergents are readily available in supermarkets. There have been several reports of accidental and intentional ingestion of acidic toilet detergents in Japan. Digestive corrosion secondary to acid ingestion occurs when hydrogen ions combine with tissue proteins to form water-absorbing acid albuminates, causing dry coagulative tissue necrosis, in contrast with the liquefactive necrosis in alkali ingestion. However, tissue coagulation inhibits deep penetration of the causative agent; therefore, lesions are usually more superficial compared to alkalis. Additionally, since the esophagus is made of squamous epithelium, the causative agent's transit time is shorter, causing less injury. The mucosa can limit the damage depending on the corrosive nature, volume, and concentration of the agent ingested. Contrary to alkali ingestion, in cases of acid ingestion, the esophagus is spared, but the stomach is affected. Endoscopy use in cases of acid ingestion remains controversial, depending on the timing of ingestion and the patient's general condition. Although rare, emergency surgery may be required in cases of mucosal perforation. Initial management may be conservative, such as using an intravenous proton pump inhibitor.^{1–3}

2 | CASE REPORT

We present a case of an 84-year-old male patient who developed extensive gastric necrosis 6 h after a suicide attempt by ingesting 150 mL of 7% hydrochloric acid. He developed abdominal pain shortly after ingestion and was seen in the emergency room 1 h later. No consultation with the Poison Referral Center during the early stages of administration. No findings of oral mucosal burns or peritonitis were noted. No organ damage was noted on computed tomography (CT) (Figure 1A), and he was managed with an intravenous proton pump inhibitor. Four hours after his arrival, his abdominal pain worsened. Abdominal contrast-enhanced CT revealed gastric necrosis and perforation (Figure 1B). He was then transferred to our institution for surgery.

On admission, the patient was in hemodynamic shock. His blood pressure was 71/45 mmHg, pulse rate was 117 bpm, respiratory rate was 35 bpm, and he had an oxygen saturation of 94% on a 10 L reservoir mask. Blood gas analysis showed the following: pH, 7.153; pCO₂, 32.3 mmHg; pO₂, 193 mmHg; HCO₃⁻, 10.9 mmol/L; BE, -16.2 mmol/L; and lactate, 2.5 mmol/L. His abdomen was rigid and distended. Laparotomy revealed almost complete gastric necrosis and gastric perforation, defects in

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2023 The Author. *Clinical Case Reports* published by John Wiley & Sons Ltd.

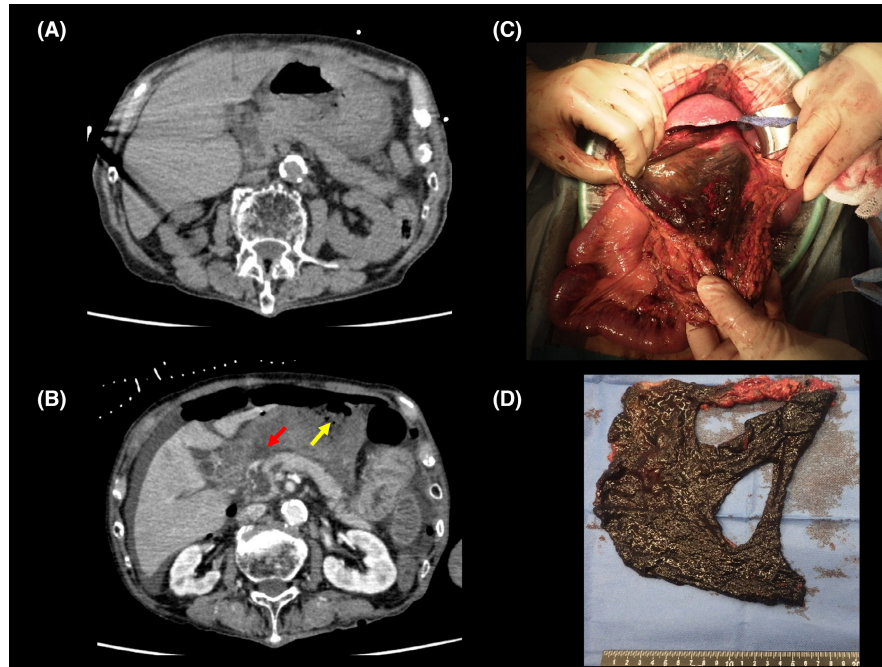


FIGURE 1 (A) Abdominal computed tomography performed immediately after admission did not show any organ damage. (B) Abdominal contrast-enhanced computed tomography of a patient with acute corrosive gastric injury 5 h after ingestion showing absent gastric wall enhancement (red arrow), gastric mucosal membrane discontinuity (yellow arrow), free air, and ascites. (C and D) The subtotal gastrectomy specimen showing transmural necrosis of the stomach.

the pancreatic capsule, and pancreatic body hemorrhage. Subtotal gastrectomy with Billroth I anastomosis and pancreateosplenectomy was performed (Figure 1C,D). His septic shock did not improve postoperatively, and the patient died 27 h after the caustic ingestion.

3 | DISCUSSION

CECT of the abdomen performed 3–6 h after ingestion of a corrosive substance has been shown to be superior to endoscopy in detecting permeability defects in the digestive tract.² In the present case, simple CT at 1 h after ingestion showed no abnormalities, but contrast CT at 4 h after ingestion showed abnormalities such as mucosal necrosis. If a CT was performed immediately after ingestion and no abnormalities were found, it would be advisable to repeat the CECT evaluation after 3–6 h unless renal dysfunction or allergy to the contrast agent is present.

AUTHOR CONTRIBUTIONS

Masaya Ushio: Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; writing – review and editing.

ACKNOWLEDGMENTS

I would like to thank Editage (www.editage.com) for English language editing.

FUNDING INFORMATION

This work did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

DATA AVAILABILITY STATEMENT

The derived data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

Our institution does not insist on ethics committee approval for case reports.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

ORCID

Masaya Ushio  <https://orcid.org/0000-0003-1358-3404>

REFERENCES

1. Chirica M, Bonavina L, Kelly MD, Sarfati E, Cattani P. Caustic ingestion. *Lancet*. 2017;389(10083):2041-2052.
2. Kalayarasan R, Ananthakrishnan N, Kate V. Corrosive ingestion. *Indian J Crit Care Med*. 2019;23(Suppl 4):S282-S286.
3. Methasate A, Lohsiriwat V. Role of endoscopy in caustic injury of the esophagus. *World J Gastrointest Endosc*. 2018;10(10):274-282.

How to cite this article: Ushio M. A case of early gastric necrosis due to ingestion of an acidic toilet cleaner. *Clin Case Rep*. 2023;11:e7481. doi:[10.1002/ccr3.7481](https://doi.org/10.1002/ccr3.7481)