Royal Australasian College of Surgeons

Gastric antrum stenosis caused by accidental ingestion of concentrated hydrogen peroxide

Hydrogen peroxide (HP) is an oxidizing agent that has since long been used for medical purposes, such as wound irrigation, dental irrigation, and enema. However, its routine use is limited by many toxic effects such as portal gas embolism[1] and proctitis.[2] Accidental ingestion of concentrated HP is not common and has been reported to cause an extensive portal gas embolism, esophagitis, gastritis,[3] and even result in death. However, reports of gastric corpus stenosis caused by accidental ingestion of HP are rare.

A 60-year-old man ingested a mouthful of HP (30%), thinking it was water after a family member filled the water jar with HP on February 23, 2020, when most households in the region used HP as a disinfectant because of the Covid-19 pandemic. He felt epigastric pain, burning sensation in the chest area, had attacks of persistent vomiting, and non-bloody foaming in the mouth and was immediately presented to a county hospital 30 min later. Upon arrival to the emergency department, his vital signs were stable, the abdomen was soft but tender, and he was neurologically intact. A computerized tomography scan of the abdomen was performed and revealed gas in the portal vein throughout the liver (Fig. 1). After gastric lavage, the patient's symptoms were not relieved, and then he was transferred to a provincial hospital.

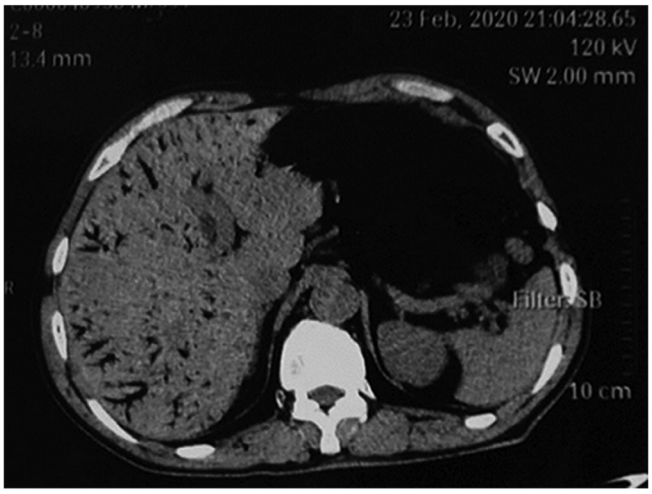

Fig. 1. Computerized tomography scan of the abdomen shows air in the portal venous system.

The patient was then treated with proton pump inhibitors and parenteral nutrition for more than 2 months and was allowed a liquid diet (less than 100 ml). He felt abdominal distension, repeatedly vomited white sticky gastric juice, and lost 11 kg weight. Endoscopy was performed on April 27, demonstrating cardiac stenosis, esophagitis, diffuse gastritis with multiple petechiae, and white exudate; gastric stenosis (Fig. 2) and gastroenterography performed on May 27 revealed gastric antrum stenosis and gastric retention. Jejunostomy was performed on May 12, and the patient was treated with continuous enteral nutrition, which provided 2000 kcal daily, through a jejunostomy tube for the following 3 months, and he gained 5 kg weight.

The patient was then readmitted, and gastroenterography (Fig. 3) performed on September 6 indicated gastric retention and gastric antrum stenosis, so gastrojejunostomy (Roux-en-Y) was performed on September 22. The patient was discharged on October 9, when he recovered to a regular diet. The patient remained well during 3 months follow-up.

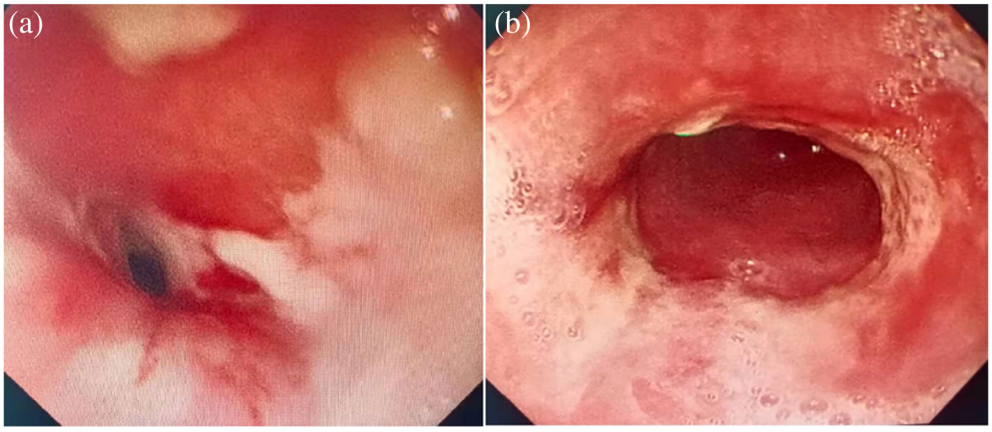

Fig. 2. Esophagogastroduodenoscopy demonstrating: (a) cardiac stenosis and esophagitis, (b) diffuse gastritis with multiple petechiae and white exudate.

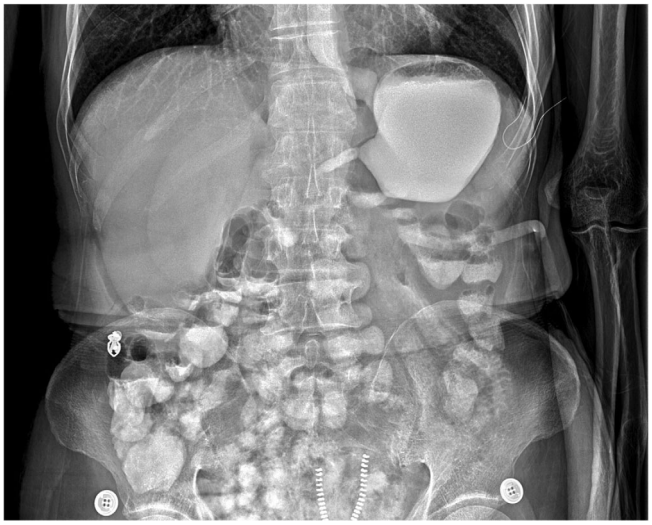

Fig. 3. Gastroenterogram 7 h after the oral administration of 80 ml of 20% loverol (September 6, 2020) demonstrating delayed emptying of contrast medium at gastric cavity and gastric outlet obstruction.

The three main mechanisms involved in HP toxicity damage include oxygen gas formation, corrosive damage, and lipid peroxidation.[4] The toxic effect of HP seems to be related to the ingested concentration and quantity. Ingestion of low concentration of HP (3%) has been reported to be usually asymptomatic or resulted in mild symptoms such as nausea and vomiting.[5] Complications such as gastritis, hemorrhagic gastritis, gastric ulcers, and gas in the portal vein have also been reported.[1–3] Accidental ingestion of concentrated HP (35%) is more likely to result in serious complications such as hemorrhagic gastritis, portal venous gas embolism, acute myocardial infarction, neurological impairment, and death.[1,4,6–8]

Our patient presented with a rare case of accidental ingestion of HP associated with the portal vein gas embolism, gastritis, and gastric antrum stenosis, which hindered the patient's intake of food and resulted in malnutrition. Waiting for a certain period before the surgical treatment of gastric antral stenosis is recommended because the stabilization of the pathological process of gastric injury takes time. Accordingly, appropriate nutrition methods should be adopted to maintain the nutrition of patients during the waiting period.

Data availability statement

All data generated appear in the submitted article.

Author contributions

Shi-lian Le: Data curation; supervision; writing – review and editing. **Long-xin Xiong:** Resources; validation; writing – review and editing. **Peng Deng:** Formal analysis; project administration; writing – original draft; writing – review and editing.

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