CLINICAL VIGNETTE

A Case of Lye Ingestion

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Case Description

A 78-year-old male with a past medical history of type 2 diabetes mellitus, chronic obstructive pulmonary disease requiring home oxygen, presented to the Emergency Department following accidental ingestion of lye. The day prior to admission, at 4pm, he was thirsty and reached for soda in the cupboard. He grabbed the bottle and "took a swig" before immediately realizing that it was not soda. He immediately spat out what was in his mouth and rinsed it out multiple times with water. He believes that he spat out most of it, but unsure of the amount of the substance "trickled down." The bottle was from the Philippines and after he translated it, he realized that the bottle contained sodium hydroxide otherwise known as lye. He was unable to obtain a ride to the hospital; therefore, he presented the following day at noon. He denied dysphagia to solids or liquids, sore throat, or difficulty breathing. He also denied nausea or vomiting. Since the incident, he could eat normally without any difficulty, including sausage for breakfast just prior to coming into the Emergency Department. He did not report any abdominal pain but did note mild neck pain. His temperature was 97.5 F, pulse 79, respiratory rate 18, blood pressure 168/95, and his oxygen saturation was 100 %.

His physical exam, including head, ears, nose and throat, pulmonary, cardiac, and abdominal were normal except for very mild erythema in the posterior oropharynx with no evidence of ulceration, erythema, or a chemical burn. His laboratory values were all within normal limits. His chest and abdominal radiographic films was unremarkable. Poison control center was contacted. As the patient was hemodynamically stable with no outward symptoms (drooling, vomiting, dysphagia), the Poison Control office advised no further interventions in the Emergency Department. The patient was advised to follow up with his primary care physician after discharge. A follow-up phone call the following day confirmed that the patient remained asymptomatic.

Discussion

Lye (sodium or potassium hydroxide) is a commonly used compound in soap making and household cleaning products. Its ingestion can cause severe injury to the stomach and/or esophagus depending on the amount ingested, the duration of contact with the mucosa, and the concentration of the substance.[1]

In the United States, more than 5,000 cases of caustic ingestions are reported annually with most cases occurring in the pediatric population.[2] Ingestion can be accidental, as seen in children or intentional, as seen in adults. Ingestion results in a liquefactive necrosis that affects the esophagus greater than the stomach or duodenum. This is likely due to the neutralization of the alkaline substance by the acidic gastric juice. Serious esophageal damage can occur once alkaline liquid penetrates to deep muscle layers. In the most severe cases, it can cause esophageal perforation, mediastinitis, peritonitis, and death.[3]

Clinical presentation will vary, but presence of symptoms or evidence of oral burns does not reliably predict the severity of the gastrointestinal tract injury.[4] Common symptoms include: hyper-salivation, dysphagia, odynophagia, and oropharyngeal, retrosternal or epigastric pain. Persistent severe retrosternal or back pain may indicate esophageal perforation with mediastinitis.[5]

If only a small amount was ingested and the patient is asymptomatic, he/she may be discharged.[6] Patients with significant ingestion whether based on history or clinical exam, should be admitted to the surgical or medical intensive care unit. Patients should be kept NPO and treated with intravenous fluids, analgesics and proton pump inhibitors. Serial chest and abdominal radiographic films may be indicated.[5] It is important to avoid emetics, neutralizing agents, or nasogastric intubation/suction as all three can lead to further damage. Activated charcoal is contraindicated as it does not absorb caustic substances and would interfere with any endoscopic evaluation.[7]

Patients with significant ingestion that are hemodynamically stable and have no perforation should undergo an upper gastrointestinal endoscopy in an expedited manner to evaluate the extent of the damage. Zargar et al developed a grading system for esophageal injury to predict subsequent clinical outcome.[8] Grade 1 injuries demonstrate mucosal edema and hyperemia; grade 2a shows friability, hemorrhages, erosions, blisters, whitish membranes, exudates, and superficial ulcerations; grade 2b shows additional deep or circumferential lesions; grade 3a lesions have small and scattered areas of necrosis; and grade 3b injuries demonstrate extensive necrosis. Further management would be dictated by the results of the endoscopy. If there is only mild or no injury, then the patient may be discharged. If there is mucosal edema, hyperemia,

superficial ulcers, bleeding, or exudates then a liquid diet can be started and advanced to a regular diet in 24-48 hours.[2] If there are deep focal, or circumferential ulcers, focal necrosis, or extensive necrosis the patient should have a trial of liquid administered through nasogastric feeding tube at 24 hours and may drink liquids at 48 hours, if they can swallow saliva.[2] If there is focal or extensive necrosis, patient should be observed for a week. Any signs of perforation, mediastinitis, or peritonitis would be indications for emergent surgery. The late sequelae of stricture formation depends on the depth of the damage and the amount of the ensuing collagen deposition.[8]

Conclusion

This clinical case highlights the presentation and management of a patient with lye ingestion. This patient presented with a history of ingesting a small amount of sodium hydroxide, but was clinically stable. He showed no signs of any injury requiring observation or further work up so he was discharged home and told to return if any new symptoms developed. This case showed the best possible outcome following lye ingestion. Had there been any sign of damage or any other symptoms such as dysphagia, further admission and work up would have been indicated.

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