

4%

1

= Abstract =

Corrosive Injury of the Stomach and Esophagus by Sodium Hypochlorite Ingestion -A case report-

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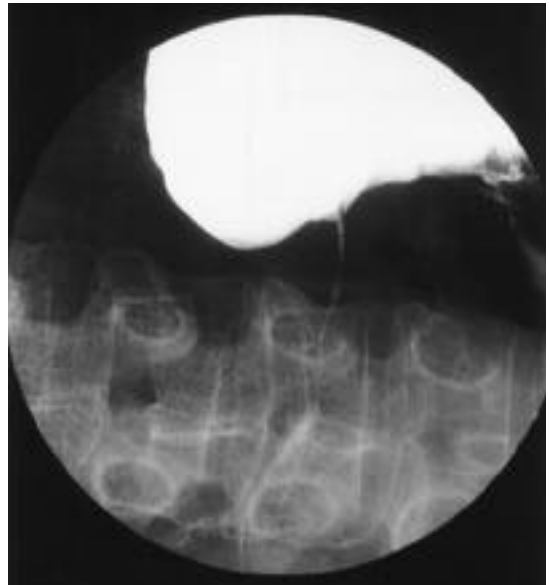
Ingestion of sodium hypochlorite bleach is usually benign, leading most emergency departments to advocate conservative home management. We report a rare case of household bleach ingestion. A 54-year-old male ingested unintentionally an unknown quantity of household bleach (4% sodium hypochlorite, pH<12). He was transferred to our department for further evaluation and management from a local general hospital because of continuous vomiting and suspicious gastric malignant lesions on the endoscopic findings. The results of repeated gastrointestinal endoscopy were corrosive injury to the stomach and the esophagus. About 60 days following ingestion of the bleach, he underwent a hemigastrectomy due to pyloric stenosis. The literature regarding corrosive injury following bleach ingestion is reviewed.

Key Words: Sodium hypochlorite, Bleach, Corrosive injury

I.
(sodium hypochlorite)

가
12
6%

pH
3-



1.

4%

1

가

60

1

50

, 30

가

(1)

II.

: 54 가

4%

Mallory-Weiss

III.

가

, builder,

, 4가

가

가

가

가

X

2

가

가

가

가

(American Association of Poison

Control Center: AAPCC)

가

3

,
6%

2

3%가

가 ^{1,2)} 가 ⁴⁾ Racioppi
 (sodium perborate), 1989 4
 가

3 6% (pH< 12) ²⁾ 가 ⁵⁾ 가
 가 , , ,
 , ,
⁶⁾, 393 Landau

⁷⁾, 129
 Pike ⁸⁾
 Sugawa 가

^{1,2)}
⁹⁾
³⁾ ,
 , ,
 ,

Ross

(5.25%, pH = 11.4)

가 가 가 , ,
³⁾, Ward ,
 가

2 hypochlorous acid chlorine

5% 가 (10% NaOCl 500 ml 673 mmol

가)

¹⁰⁾
 , ,
²⁾ ^{3,11)} ¹²⁻¹⁴⁾

Harley 19 , ¹⁵⁾

가 .

가 ,

1

Jakobsson 4.5%

가

가

가

16).

5-15 ml/kg

가

가

esophagoventricular membrane

가

가

1 ,

가

2

가

3 ,

1

가

Cardona

가

20,21)

1

2

1

17).

가

가

4).

Trabelsi

가

가

46%

가

, 26%

(grade 2 3)

6

18).

가

가

6-8 19)

12 6)

가

19)

가

가

1. Muhlendaha KE, Oberdisse U, Krienke EG: Local injuries by accidental ingestion of corrosive substances by children. *Arch Toxicol* 39:299-314, 1978.
2. Temple AR: Bleach, soaps, and detergents: Haddad LM, Winchester JF: Poisoning and drug overdose, 2nd ed. p 1070-1075, W.B. Saunders Co, 1990.
3. Ross MP, Spiller HA: Fatal ingestion of sodium hypochlorite bleach with associated hypernatremia and hyperchloremic metabolic acidosis. *Vet Hum Toxicol* 41:82-86, 1999.
4. Harley EH, Collins MD: Liquid household bleach ingestion in children: a retrospective review. *Laryngoscope* 107:122-125,1997.
5. Racioppi F, Daskaleros PA, Besbelli N et al: Household bleaches based on sodium hypochlorite: review of acute toxicology and poison control center experience. *Food Chem Toxicol* 32:845-861,1994.
6. Anderson KD: Alkali injury: Haddad LM, Winchester JF: Poisoning and drug overdose, 2nd ed. p 1065-1062, W.B. Saunders Co, 1990.
7. Landau GD, Saunders WH: Effect of chlorine bleach on the esophagus. *Arch Otolaryngol* 80: 174-179, 1964.
8. Pike DG, et al: Re-evaluation of the dangers of clorox ingestion. *J Pediatr* 63: 303, 1963.
9. Sugawa C, Lucas CE: Caustic injury of the upper gastrointestinal tract in adults: a clinical and endoscopic study. *Surgery* 106:802-806,1989.
10. Ward MJ, Roytledge PA: Hypernatremia and hyperchloraemic acidosis after bleach ingestion. *Hum Toxicol* 7:37-38,1988.
11. Loeb FX, King TL: Chronic gastroduodenitis due to laundry bleach. *Am J Dis Child* 128:256-257,1974.
12. Van Rhee F, Beaumont DM: Gastric stricture complicating oral ingestion of bleach. *Br J Clin Pract* 44:681-682,1990.
13. Al-Samarrai AY: Circular myotomy for mid-oesophageal stricture. *Z Kinderchir* 44:55-57,1989.
14. French RJ, Tabb HG, Rutledge LJ: Esophageal stenosis produced by ingestion of bleach: report of two cases. *South Med J* 60:1140-1144,1970.
15. Babl FE, Kharsch S, Woolf A: Airway edema following household bleach ingestion. *Am J Emerg Med* 16:514-516,1998.
16. Jakobsson SW, Rajs J, Jonsson JA, Persson H: Poisoning with sodium hypochlorite solution. Report of a fatal case, supplemented with an experimental and clinico - epidemiological study. *Am J Forensic Med Pathol* 12:320-327,1991.
17. Cardona J, Boussemart T, Berthier M, Oriot D: Accidental bleach ingestion in children: results of a survey in 11 anti-poison centres. proposals for management. *Pediatrie* 48:705-709,1993.
18. Trabelsi M, Loukhil M, Boukthir S, Hammami A, Bennaceur B: Accidental ingestion of caustics in Tunisian children. report of 125 cases. *Pediatrie* 45:801-805,1990.
19. Wason S: The emergency management of caustic ingestions. *J Emerg Med* 2:175-182,1985.
20. Krey H: Treatment of corrosive lesion in the esophagus. *Acta Otolaryngogy(Stockh) (suppl)* 102: 1,1952.
21. Kirsh MM, Ritter F: Caustic ingestion and subsequent damage to the oropharyngeal and digestive passages. *Ann Thorac Surg* 21:74-77,1976.