

# Delayed Sequelae of Hydrochloric Acid Ingestion

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## Abstract

Hydrochloric acid is the active ingredient in common toilet bowl cleaner agents used in Thailand but it is occasionally abused for suicidal attempts by ingestion. Clinicopathological description caused by this agent has rarely been mentioned in the literature. We reported three cases of gastric outlet obstruction. Two of these cases were initially treated in provincial hospitals by gastric lavages. No clinical symptoms relating to ingestion and swallowing were present in the early period after ingestion but patients developed vomiting and cachexia a few months later. Among these three cases, pylorus and antrum were the most common sites of injury. All cases were gastrectomized and pathological findings of the resected specimens showed mucosal ulceration, submucosal fibrosis, thickening of muscularis mucosae, and eosinophilic infiltrations. Most cases in the literature had preoperative jejunostomy preformed but our cases did not have such a preoperative procedure. The outcomes of all cases were considered good and no postoperative complication was found. This presentation is aimed to stimulate physicians to be aware of delayed complications of hydrochloric acid ingestion and long term follow-up is required even though the initial symptoms of the patients were minimal.

**Key word :** Hydrochloric Acid, Delayed Sequelae, Gastric Outlet Obstruction

Suicidal attempts in the Thai population are approximately 4 per 100,000 a year. Among these, ingestion of chemical toxic agents was the most common method used and accounted for about 70 per cent of the cases<sup>(1)</sup>. Hydrochloric acid is the active ingredient of popular toilet bowl cleaner

agents used in this country and several victims using this agent attended hospitals throughout the years. The initial clinical signs and symptoms may be very mild and physicians may not be aware of the sequelae. The clinical and pathological description of late complications have rarely been described. We, there-

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fore, report three cases who presented with gastric outlet obstruction as a late complication after ingestion of the agent.

## CASE REPORTS

### Case 1

A 25 - year - old female came to Ramathibodi Hospital with problems of vomiting and abdominal distension after meals. Four months prior to this admission she had a history of ingesting approximately 60 ml of toilet bowl cleaner agent that had hydrochloric acid as the active ingredient and she was immediately treated by gastric lavage in the local hospital. She was discharged two days after that admission without any complication. She remained well until 3 months prior to this admission when she developed vomiting and abdominal distension a few hours after ingestion of food.

On physical examination, she was markedly cachectic, her body weight was 36.5 kg. whereas her height was 158 cm, her weight was estimated to be 68 per cent of her ideal body weight. Vital signs were as follows : body temperature 37.2°C, blood pressure 100/60 mmHg, pulse rate 90 per minute, respiratory rate 24 per minute. The complete blood count revealed hematocrit of 35.5 per cent, WBC 5,500 cell per mm<sup>3</sup>, neutrophils 57 per cent lymphocytes 58 per cent, monocytes 5 per cent. The serum electrolyte showed Na<sup>+</sup> 138 mmole/l., K<sup>+</sup> 3.6 mmole/l, Cl 109 mmole/l, and CO<sub>2</sub> 26 mmole/l. The serum albumin was 39.1 g/dl. The upper GI study revealed normal esophagus and esophagogastric junction but showed delayed passing of contrast media through the pylorus, compatible with gastric outlet obstruction. The gastroscope showed inflamed mucosa with contact bleeding, rigid antrum, and stenosis of the pylorus. Antrectomy and Billroth-II anastomosis were performed. The pathological findings of the resected specimen showed ulceration of mucosa with submucosal fibrosis and a moderate amount of eosinophilic infiltration in the mucosa, submucosa, and muscular layer. The muscularis mucosae had become thickened and showed disarrayed muscle fibers. The patient was discharged 6 days after surgery without complication. She was seen one month later and was noted to have no problem in swallowing and ingestion.

### Case 2

An 18 - year-old male cabaret dancer with the problem of vomiting which occurred two months

after ingestion of toilet bowl cleaner containing hydrochloric acid as the active ingredient (about 120 ml). Vomiting often took place 5-10 minutes after meals. He was initially treated at Samui Hospital and discharged after three days of admission without any complications. He started to develop the problem of vomiting 2 months later.

On physical examination he was cachectic, his body weight was 39 kg, whereas his height was 168 cm, his weight was estimated to be 57 per cent of his ideal body weight. Vital signs were as follows : body temperature 37°C, blood pressure 110/60 mmHg, pulse rate 80 per minute, respiratory rate 18 per minute. The complete blood count revealed hematocrit of 36 per cent WBC 9,300 cell per mm<sup>3</sup> neutrophils 68 per cent lymphocytes 20 per cent, monocytes 3 per cent and eosinophils 4 per cent. The serum electrolyte showed Na<sup>+</sup> 138 mmole/l, K<sup>+</sup> 3.3 mmole/l, Cl 106 mmole/l, and CO<sub>2</sub> 24 mmole/l. The serum albumin was 39.2 g/dl. The upper GI study revealed stricture of the distal body and antrum as well as a duodenal bulb and a fibrous tract was found allowing the contrast media pass to the antrum and duodenum. The gastroscope showed stricture of the gastric lumen and multiple pseudo-diverticulum, fibrosis and stenosis from the body of the stomach. Total gastrectomy and Roux-en-Y esophagojejunostomy was performed. The pathological findings of the specimen were similar to those of case I. The patient was discharged 8 days after surgery without complication. He was seen two months later and was noted to have no problem in swallowing and ingestion.

### Case 3

A 26 year-old male with a history of ingestion of toilet bowl cleaner that has hydrochloric acid as the active ingredient (260 ml) and 18 g of Combat® (insecticides) came to Ramathibodi Hospital with the problem of difficulty in swallowing. The esophagoscope revealed eroded mucosa compatible with corrosive induced esophagitis. One month later he presented with upper GI hemorrhage and vomiting after ingestion.

On physical examination, he was markedly cachectic with a body weight of 44 kg, whereas his height was 170 cm; his weight was estimated to be 62 per cent of his ideal body weight. Vital signs were as follows : body temperature 37.5°C, blood pressure 110/70 mmHg, pulse rate 80 per minute, respiratory rate 20 per minute. The complete blood

relatively superficial coagulative necrosis is often seen in the esophagus but a large area of ulceration such as seen in alkaline ingestion, does not occur. For the stomach, the commonest part of damage occurs in the antrum with relative sparing of the acid productive area. Strictures of antrum to duodenum can occur as late sequelae and may require resection or bypass surgery. If the strictures are neglected, cancer may develop later<sup>(4)</sup>. The pathological findings of the resected specimens show mucosal ulceration,

submucosal fibrosis, thickening, and disarrangement of the muscularis mucosae, and eosinophilic infiltration (Fig 1, 2). Eosinophils may be present in a wide variety of conditions. Involvement of the muscularis propria will produce thickening and scarring, often with pyloric stenosis<sup>(5)</sup>.

In conclusion, physicians should be aware of the delayed complications of hydrochloric acid ingestion, even though the immediate effect is mild, long term follow-up is also required.

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## ภาวะแทรกซ้อนที่ติดตามมาในระยะหลังเนื่องจากการดื่มกรดไฮโดรคลอริก

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กรดไฮโดรคลอริกเป็นส่วนประกอบของน้ำยาล้างห้องน้ำซึ่งเป็นสารเคมีที่นำมาใช้บ่อยในชีวิตประจำวันของคนไทย ผู้ป่วยบางรายนำมาใช้ดื่มเพื่อฆ่าตัวตาย เนื่องจากยังไม่มีกรารายงานที่เฉพาะเจาะจงในทางคลินิกและพยาธิสภาพที่เกิดจากการดื่มกรดไฮโดรคลอริก บทความนี้เป็นกรารายงานผู้ป่วย 3 ราย ที่มาด้วยเรื่องกระเพาะอาหารตีบตันหลังจากการดื่มน้ำยาล้างห้องน้ำที่มีกรดไฮโดรคลอริกเป็นสารออกฤทธิ์ ผู้ป่วย 2 รายได้รับการรักษาเบื้องต้นโดยการล้างท้องจากโรงพยาบาลประจำจังหวัด ในระยะแรกผู้ป่วยสบายดี หลังจากนั้นกลับมาด้วยอาการอาเจียน กินอาหารไม่ได้และผอมลง ใน 2-3 เดือนต่อมา ผู้ป่วยทั้ง 3 รายกระเพาะอาหารส่วนไพไรรัสและแอนทรมเป็นส่วนที่เกิดพยาธิสภาพมากที่สุด ผลการตรวจทางพยาธิวิทยาหลังจากการผ่าตัด พบว่ามีแผลบริเวณเยื่อของกระเพาะอาหาร มีการหนาตัวของชั้นกล้ามเนื้อ และพบเม็ดเลือดขาวชนิดอีโอสิโนฟิลมากกว่าปกติ ในด้านการรักษาผู้ป่วยพบว่ารายอื่นมีการผ่าตัดเพื่อให้อาหารทางลำไส้เล็กก่อน ส่วนผู้ป่วยที่นำมารายงานนี้ไม่มีการทำผ่าตัดเช่นนั้นก่อน แต่ก็ไม่มีผลแทรกซ้อนจากการรักษา รายงานนี้มีวัตถุประสงค์เพื่อที่จะกระตุ้นเตือนให้แพทย์นึกถึงอาการที่ติดตามมาในภายหลังจากการดื่มกรดไฮโดรคลอริก และควรมีการติดตามการรักษาแม้ว่าในระยะแรกผู้ป่วยไม่มีอาการอะไร

**คำสำคัญ :** กรดไฮโดรคลอริก, ภาวะแทรกซ้อนที่ติดตามมาในระยะหลัง, กระเพาะอาหารตีบตัน

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