CASE REPORT

Successful Treatment with a Combination of Endoscopic Injection and Irrigation with Coca Cola for Gastric Bezoar-induced Gastric Outlet Obstruction

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We report a case of gastric bezoar-induced gastric outlet obstruction that was successfully treated with a combination of endoscopic injection and irrigation with Coca Cola. A 73-year-old diabetic woman had a history of perforated peptic ulcer and had received pyloroplasty more than 20 years previously. She had been ingesting Pho Pu Zi (Cordia dichotoma Forst. f.) as an appetizer for 1 month. She presented with epigastric pain, nausea, and vomiting. Upper gastrointestinal endoscopy, performed at a local hospital, showed 2 gastric bezoars in the stomach, and 1 of them impacted at the pylorus. She was referred to our emergency department for removal of the gastric bezoars that were suspected to be causing gastric outlet obstruction. All attempts at endoscopic removal using a polypectomy snare, biopsy forceps and Dormia basket failed. We then injected Coca Cola directly into the bezoar mass, followed by irrigation with Coca Cola. Follow-up endoscopy was performed the next day, which revealed that the gastric bezoars had dissolved spontaneously. [J Chin Med Assoc 2008;71(1):49–52]

Key Words: bezoars, Coca Cola, endoscopy, gastric outlet obstruction

Introduction

Bezoars are collections or concretions of indigestible animal or vegetable material that accumulate and coalesce in the gastrointestinal tract, usually the stomach.1–3 Gastric bezoar formation occurs in patients with altered gastric physiology, impaired gastric emptying and/or reduced acid production. Poor mastication and ingestion of large quantities of indigestible solids may precipitate bezoar formation.4–7 The reported incidence of bezoars is 0.4%,8 although the true incidence is unknown. Symptoms of gastric bezoars are usually vague and nonspecific, including nausea, vomiting, epigastric pain, foul breath, halitosis, and early satiety.6,9 Bezoars usually form in the stomach, but can pass into the small intestine, where they occasionally cause obstruction.5,9–11 Endoscopy, barium studies, sonography, and computed tomography are helpful in the diagnosis of bezoars.5–6 The treatment of gastric bezoars can be conservative (via endoscopic removal) or surgical. The efficacy of nasogastric lavage with Coca Cola for dissolution of gastric bezoars and direct intra-bezoar infusion endoscopically has been reported in Greece, Japan and South Korea.4,6,12,13 Herein, we report the case of a patient with gastric bezoars who was successfully treated with a combination of endoscopic injection and irrigation with Coca Cola.

Case Report

In November 2004, a 73-year-old woman was referred to our emergency department because of epigastric pain, nausea, and vomiting. She had a history of hypertension,
diabetes mellitus, and perforated peptic ulcer status post pyloroplasty more than 20 years ago. She had been ingesting Pho Pu Zi (Cordia dichotoma Forst. f.) as an appetizer for 1 month. Upper gastrointestinal endoscopy, performed at a local hospital, showed 2 gastric bezoars, with 1 of them impacted at the pylorus. With suspected gastric bezoar-induced gastric outlet obstruction, she was referred to our hospital for bezoar removal.

On physical examination, she appeared acutely ill, but with stable vital signs (blood pressure 175/82 mmHg, pulse rate 93/min, respiratory rate 18/min). Her abdomen was soft, but showed tenderness over the epigastric area. Laboratory data included white blood cell count 12,700/mL, with 74.4% neutrophils, 19.3% lymphocytes and 4.7% monocytes, hemoglobin 14.4 g/dL, platelet count 447,000/mL, blood glucose 156 mg/dL, blood urea nitrogen 16 mg/dL, creatinine 0.8 mg/dL, sodium 143 mmol/L, and potassium 4.0 mmol/L.

Upper gastrointestinal endoscopy was performed using a standard forward-viewing endoscope with a 2.8-mm diameter accessory working channel (GIF-XQ240; Olympus, Tokyo, Japan). It showed 2 gastric bezoars, the larger 1 in the body of the stomach, and the other impacted at the pylorus, inducing gastric outlet obstruction (Figure 1). All initial attempts at endoscopic removal using a polypectomy snare, biopsy forceps and Dormia basket failed. The surfaces of the gastric bezoars were slightly damaged by the mechanical effects of the endoscopic procedure.

We then decided to use Coca Cola to dissolve the bezoars. The contents of 1 can of Coca Cola (Coca Cola Co., Taiwan) were drawn into a 30-mL syringe. The tip of a 22G injector was used to inject the Coca Cola through the accessory working channel into the bezoar masses, infusing the Coca Cola in multiple directions. The residual content of the can of Coca Cola, about 100 mL, were then irrigated into the stomach. The total procedure required about 60 minutes. That night, the patient was treated with intravenous metoclopramide 10 mg every 8 hours, and was given another can of Coca Cola to drink. The next morning, repeated endoscopy showed that the gastric bezoars had dissolved completely, and the stomach, pylorus and duodenal bulb were clear (Figure 2). At follow-up 1 year and 6 months later, upper gastrointestinal endoscopy revealed no bezoar recurrence.

Discussion

Bezoars are collections or concretions of indigestible foreign material that accumulate and coalesce in the gastrointestinal tract.1 Most bezoars reside in the stomach but may be encountered elsewhere in the gastrointestinal tract, including the rectum and even the esophagus.2 Bezoars are classified into 4 main types, according to the materials of which they are composed: phytobezoars, trichobezoars, medication bezoars, and lactobezoars. The most common type is phytobezoars, which consist of indigestible fruit, vegetable fiber, skin or seeds. Phytobezoars are classically found in adults with a history of previous gastric surgery, conditions of reduced gastric acidity, poor gastric mixing, or delayed motility. Trichobezoars, or hairballs, are a mass of hairs and/or decaying food material, usually found in children and young females with psychiatric disorder or mental retardation. Medication bezoars consist of undigested tablets or semi-liquid drugs. Lactobezoars are frequently found in low-birth-weight or premature neonates fed a highly concentrated formula within the
first weeks of life. Bezoars usually form in the stomach, but can pass into the small intestine, where they occasionally cause obstruction. Contributing factors for obstruction include dysmotility of the gastrointestinal tract, dehydration, and diabetes mellitus.

Gastric bezoar formation occurs in patients with altered gastric physiology, impaired gastric emptying and/or reduced acid production. This is usually caused by previous gastric surgery, such as partial gastrectomy, vagotomy or pyloroplasty, but may be caused by gastroparesis or gastric outlet obstruction. Poor mastication and ingestion of large quantities of indigestible solids may precipitate bezoar formation.

It is customary in certain areas of Taiwan to eat the pickled fruit of the Pho Pu Zi (Cordia dichotoma Forst. f.) as an appetizer. The sticky pulp and indigestible seeds of this fruit can form a phytobezoar if ingested excessively. The reported incidence of bezoars is 0.4%, although the true incidence is unknown. In patients with symptoms after antrectomy, the incidence is much higher, in the range of 10–25%. Predisposing factors for gastric bezoar formation in this case included diabetes mellitus, a history of pyloroplasty, and ingestion of Pho Pu Zi for 1 month.

The symptoms of gastric bezoars are usually vague and nonspecific, depending on the size, location, and degree of disturbance of gastric physiology. Symptoms may include nausea, vomiting, epigastric pain, foul breath, halitosis, and early satiety. Gastric outlet obstruction, gastrointestinal tract bleeding, perforation, peritonitis, and intestinal obstruction may also be complicating factors.

Diagnosis of gastric bezoars requires a high index of suspicion. There is no classical presentation based on history or physical or radiographic findings. Upper gastrointestinal endoscopy is the most sensitive diagnostic method. Barium studies, sonography, and computed tomography are also helpful in the diagnosis.

The treatment of gastric bezoars can either be conservative or surgical. Conservative treatment is usually based on endoscopic fragmentation and extraction, dissolution with enzyme or medicine. Surgical treatment is via laparotomy or laparoscopy after a failed conservative procedure. The efficacy of nasogastric lavage using Coca Cola for dissolution of gastric bezoars and direct endoscopic intrabezoar infusion has been reported in Greece, Japan, and South Korea. Ladas et al lavaged Coca Cola through a nasogastric tube to dissolve a gastric phytobezoar. However, they recommended that a large volume of the beverage, nearly 3 liters, be used, and the lavage was performed over 12 hours.

In contrast, we injected Coca Cola easily into the bezoars, and the patient only needed to drink 1 can of Coca Cola afterwards. The combination of endoscopic injection and oral intake of Coca Cola seemed to be rapidly effective and safe. Lee et al reported 2 cases of phytobezoars that were treated by oral administration of Coca Cola. These 2 patients drank 700–800 mL of Coca Cola daily, and after 2 months, complete dissolution of bezoars was achieved. Oral administration of Coca Cola for at least 2 months was not suitable for our patient because she was diabetic. Besides, some types of phytobezoars, such as diospyrobezoars, are considered to be harder than other types, and complete dissolution of bezoars may not be achieved by only drinking Coca Cola in such a case. Oral intake and endoscopic injection of Coca Cola seemed to be the best approach, which proved to be easy, rapidly effective, inexpensive and safe in our patient. This form of gastric bezoar dissolution should be studied prospectively in a series of patients.

Figure 2. Post treatment endoscopic view of: (A) the body of the stomach; (B) deformity of the pylorus and duodenal bulb.
The mechanism of Coca Cola dissolution is not well understood. Acid is important in digesting fiber. Coca Cola, which has a pH of 2.6, may be a substitute for normal gastric acidity.\(^4,6\) In addition, it has been suggested that the NaHCO\(_3\) contained in Coca Cola has a mucolytic effect.\(^12\) Furthermore, penetration of CO\(_2\) bubbles into the surface of bezoars may digest the fibers of concretion. The combined action of NaHCO\(_3\) and CO\(_2\) as well as unknown agents in Coca Cola are considered the important factors in dissolving bezoars.

In conclusion, we have reported a case of gastric bezoar-induced gastric outlet obstruction that was successfully treated with a combination of endoscopic injection and irrigation with Coca Cola. This method proved to be rapidly effective, inexpensive and safe. The classification, presenting symptoms, diagnostic methods, and treatment of bezoars were discussed. The ultimate goal of bezoar treatment is removal and prevention of recurrence. Thus, educating patients about which causative fruits or vegetables to avoid and proper mastication would be beneficial in preventing the recurrence of bezoars.

References