CASE REPORT

Gastric Outlet Obstruction--An Unexpected Complication during Coca-Cola Therapy for a Gastric Bezoar: A Case Report and Literature Review

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Abstract

Gastric bezoars are concretions of undigested material, and Coca-Cola therapy is an easy, efficacious and safe approach for bezoar treatment. Gastric outlet obstruction due to a migratory gastric bezoar during Coca-Cola therapy is an uncommon presentation and, to the best of our knowledge, no cases have been previously reported. We herein describe one such case with no known predisposing factors that recovered via the endoscopic technique. A thorough literature search was performed, which yielded eight relevant patients from seven publications, all of who developed gastrointestinal obstruction during dissolution treatment and recovered uneventfully after surgical intervention. In conclusion, this potential complication should be kept in mind in the event that alternative treatment is necessary.

Key words: bezoar, endoscopy, migration, gastrointestinal obstruction

Introduction

Gastric outlet obstruction (GOO) is caused by diseases that mechanically impede gastric emptying. Currently, more than half of GOO cases have been reported secondary to malignancy (1). Bezoars are a rare benign cause of GOO with sporadic cases reported (2, 3). As concretions of swallowed foreign bodies or food fibers, bezoars are typically formed in the stomach but may be encountered elsewhere, such as the intestine, rectum and even the esophagus. They are relatively uncommon with a reported incidence of 0.4% (4). Bezoars occur most commonly in patients with decreased gastric motility (e.g., diabetic gastroparesis, prior gastric operation such as vagotomy, Billroth I or II operations), incomplete mastication, and excessive consumption of food with high fiber contents (5, 6). According to their compositions, gastric bezoars can be classified into four categories: phytobezoars, trichobezoars, lactobezoars, and pharmacobezoars (7). Surgical intervention was previously the only means of removing a bezoar before 1959, however, it is presently preferred only after conservative treatment failure or the occurrence of treatment-related complications (8). Nonsurgical treatments involving endoscopic extraction and/or fragmentation and dissolution treatment with diverse proteolytic enzymes or Coca-Cola are currently considered to be the primary therapeutic option for gastric bezoars. Adverse effects of conservative treatments such as a gastric ulcer, alimentary tract perforation and small intestinal obstruction have been reported (9-16). Though rare, the emphasis of treatment should be on the prevention of these complications. GOO due to the migration of a gastric bezoar during dissolution therapy is a rare and catastrophic complication of conservative treatment. To date, no relevant cases have been reported, and no prior research has summarized the association between secondary gastrointestinal obstruction and dissolution treatment.

We herein report a case of an 88-year-old woman with no known risk factors who was admitted to our hospital with GOO caused by the migration of a gastric bezoar during Coca-Cola treatment. We also review the pertinent literature regarding this disorder and discuss the safety profile of chemical dissolution treatment.

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Case Report

An 88-year-old woman was admitted to our emergency department with postprandial epigastric pain accompanied by abdominal fullness, nausea and vomiting of 4 days' history. She complained that she developed abdominal pain, easy satiety and a loss of appetite 2 months previously after the daily consumption of ten to fifteen persimmons for a week. She was then referred to a local hospital and a giant bezoar (9.2×3.6 cm in size) was detected in her stomach by sonography. According to her food history and sonographic examination, a diagnosis of a persimmon bezoar was made at that time. Because of her poor general condition and advanced age, conservative treatment was preferred. She was discharged with a prescription of taking two bottles of Coca-Cola (500 mL) every day as well as dietary instruction for a low fiber diet. A subsequent ultrasound examination demonstrated that the giant bezoar was divided into two small fragments (7.1×4.3 cm in size and 2.7×2.3 cm in size) and she was gradually relieved from the symptoms with the mass still located in her stomach. However, 4 day before admission, she developed acute epigastric pain after Coca-Cola consumption and was immediately admitted to a local hospital. Upper gastrointestinal endoscopy was performed to evaluate the cause of her symptoms. The endoscopic examination report she provided confirmed a dilated stomach with the mass still located in her stomach. However, 4 day before admission, she developed acute epigastric pain after Coca-Cola consumption and was immediately admitted to a local hospital. Upper gastrointestinal endoscopy was performed to evaluate the cause of her symptoms. The endoscopic examination report she provided confirmed a dilated stomach with retained food and a greenish-yellow bezoar was detected in the first portion of the duodenum, causing obstruction of the pyloric canal. Endoscopic removal failed. The patient was then referred to our hospital for further treatment.

Further questioning revealed that she had a history of constipation for over 10 years, gallbladder stone and rheumatoid arthritis for over 5 years. She denied any previous gastric surgery or diabetes mellitus.

On physical examination, she appeared ill and weak due to insufficient digestion; her abdomen was soft but she had mild tenderness over the epigastrium. The rest of her examination was normal. Laboratory data revealed mild hypotonic dehydration. An urgent abdominal computerized tomography scan showed a dilated stomach and an intraluminal mass (3×2 cm in size) with entrapped air was located in the first portion of the duodenum, compatible with the features of bezoars (Fig. 1).

According to the examination and CT scan results, oral food intake was stopped and fluid supplementation and intravenous pantoprazole was subsequently commenced. Gastric decompression and gastric lavage with 1.5 L of Coca-Cola (performed in a 12-hour period) was simultaneously performed through a dual-cavity nasogastric tube. Our patient was endoscoped by an experienced endoscopist using a standard forward-viewing endoscope with a 2.75 mm diameter accessory working channel (GIF-Q260; Olympus, Tokyo, Japan) on the following morning. A huge greenish-brown, semisolid bezoar was located in the post-pyloric region (Fig. 2A). Various endoscopic techniques were used to remove the bezoar from the duodenal lumen, which all failed due to the large size and smooth surface of the bezoar. With close observation for signs of perforation, we injected 80 mL of Coca-Cola through a 7 Fr biliary dilatation catheter into the bezoar masses in multiple directions (Fig. 2B). Some fissures were observed on the surface of the bezoar. The bezoar was then gradually broken into small pieces using a polypectomy snare (Fig. 2C) and the small fragments were then dragged into the gastric cavity. Some small ulcers were noticed in the first part of the duodenum and no bezoar fragments remained (Fig. 2D). The procedure took approximately 45 minutes. No procedure-related complications occurred. Oral feeding was initiated on the second day after endoscopy and the patient was discharged and had an uneventful recovery within three days. She was advised to consume a low fiber diet and slowly masticate her food.

Discussion

Our case report shows that migratory gastric persimmon bezoars in an elderly woman with gastric outlet obstruction could be treated successfully with the combination of Coca-Cola lavage and endoscopic fragmentation without procedure-related complications. To the best of our knowledge, successful endoscopic intervention for migratory gastric bezoars during dissolution therapy has not been previously reported.

Altered gastrointestinal motility can contribute to bezoar formation. This is typically associated with prior gastric surgery. Vagotomy with pyloroplasty is reported with the highest incidence for bezoar growth, ranging from 65 to 80% (17). Overconsumption of indigestible fibers may also precipitate bezoar formation. As the name indicates, persimmon bezoars consist of fibrous material derived from persimmons, and they are not related to gastric surgery or impaired gastric emptying. Although persimmon bezoars are thought to be resistant to dissolution treatment, Ladas et al. reported a final success rate of 91.3% for gastric phytobezoars by Coca-Cola administration with adjuvant endoscopic
techniques, regardless of the types of bezoars and cola beverage used (18). The mechanism of bezoar dissolution by Coca-Cola is not thoroughly understood. However, a decreasing size, uneven surface and softening trend of the bezoars after Coca-Cola administration demonstrate the efficiency of Coca-Cola in dissolving gastric phytobezoars.

Most bezoars reside in the stomach. Because of the confined antrum of the intestine when compared with the stomach, obstruction can occur when gastric bezoars pass into the small intestine. Gastric bezoars can be detected by endoscopy; however, the diagnosis of small bowel bezoars depends on the physical and imaging findings of obstruction (19). Patients with an intestinal bezoar typically remain asymptomatic for years, but an emergency may occur following complete small bowel obstruction (2).

The associations between the obstruction and bezoars are complicated. Firstly, obstruction might be caused by primary intestinal bezoars which are commonly associated with certain underlying diseases, such as diverticulum, inflammatory stricture or a tumor (20-22). Secondly, small bowel obstruction may be caused by a secondary bezoar that has passed the pylorus without digestion, particularly in patients with previous gastrointestinal-related operations (23). Finally, gastrointestinal obstruction might be caused by subsequent migration of the gastric bezoar during dissolution treatment with proteolytic enzymes or Coca-Cola (10-16). The latter is a potentially catastrophic complication of conservative therapy and is generally considered to be an iatrogenic event.

A literature review revealed case reports of secondary gastrointestinal obstruction caused by migratory gastric bezoars during dissolution treatment with enzymes or Coca-Cola (Table) (10-16). Five patients (62.5%) received Coca-Cola digestion treatment before the ileus onset. All patients developed small bowel obstruction more than two days after the onset of dissolution treatment and none received monitoring during conservative treatment. All patients were discharged with uneventful recovery after surgical intervention. Interestingly, the occurrence of small bowel obstruction during Coca-Cola administration is frequent when compared with enzymatic dissolution. We speculate that the carbon dioxide bubbles released from Coca-Cola momentarily increase the pressure in the stomach, which could advantageously motivate the shrunken bezoar through the pylorus and consequently cause gastric outlet obstruction or small bowel obstruction. Subsequent therapeutic endoscopic techniques are often used to facilitate the dissolution of gastric bezoars. Incomplete endoscopic fragmentation could reduce the size of the bezoar and the fragments could pass through the pylorus. The disrupted pieces of bezoars are then retained in the small intestine, accumulate and grow in size, resulting in intestinal obstruction (15).

Coca-Cola administration is generally accepted as an inexpensive, effective and safe procedure for treating gastric bezoars. However, this case and prior cases show that we
should not neglect the potential association between secondary gastrointestinal obstruction and dissolution therapy. For patients who undergo chemical dissolution treatment, hospitalization is mandatory, and imaging tests (sonography or CT) or endoscopy is necessary for monitoring the dissolution process. Bezoars measuring less than 2-3 cm in diameter should be primarily managed by endoscopic extraction and/or fragmentation, because bezoars migration can occur, leading to subsequent gastrointestinal obstruction caused by the accumulation of fragments. However, complete endoscopic fragmentation cannot be overlooked.

In summary, this case demonstrated a dangerous complication of chemical dissolution with Coca-Cola, though previous studies generally suggest conservative procedures are safe and effective. The association between secondary gastrointestinal obstruction and dissolution therapy should be further studied. Endoscopic or imaging monitoring is necessary during resolution with various proteolytic enzymes or Coca-Cola treatment. This potentially catastrophic complication caused by migratory bezoars must be kept in mind in the event that alternative treatment is necessary.

The authors state that they have no Conflict of Interest (COI).

References


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