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CASE REPORT

Plastic Bottle Cap Bezoar in an Adult Extracted Via Laparoscopic Gastrostomy: A Case Report

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Summary

Gastric bezoar is a rare encounter in surgical practice. Extraction after diagnosis is needed to prevent complications such of bleeding, obstruction, or perforation. Endoscopy has taken centre stage in the retrieval of objects from the stomach. Laparoscopic extraction of gastric bezoars presents a better option over open surgery, where facilities for endoscopic extraction are lacking.

We present the management of a 64-year-old Nigerian man who was diagnosed during upper gastrointestinal endoscopy for his epigastric pain. The plastic bottle cap was extracted from his stomach via laparoscopic anterior gastrotomy and primary closure. He had a good postoperative outcome and has been followed up for six months without any adverse sequelae. Compared with open surgery, this report presents a less traumatic and viable approach for the extraction of a gastric bezoar. It can be a valuable option for surgeons practising in developing countries where facilities for advanced gastrointestinal endoscopy are scarce.

Keywords: Epigastric pain, Faecal occult blood, Foreign body, Gastrointestinal endoscopy, Gastrostomy, Laparoscopy.

Introduction

Plastic gastric bezoars, a type of foreign body in the stomach, are exceptionally rare. As proposed by Misra *et al.* [1], this group of bezoars deserves a class of its own, different from classical trichobezoars, lactobezoars, pharmacobezoars

and phytobezoars that have been well-described in literature.

Gastric bezoars are a rare cause of epigastric discomfort, vomiting from gastric outlet obstruction and gastric perforation. [2 -4] Reports indicate that gastric bezoars are found in 0.07 to 0.4% of all gastrointestinal endoscopies.[5] Reported risk factors for gastric bezoars include functional and structural pathologies of the stomach that cause delayed gastric emptying, such as diabetes mellitus, autonomic dysfunction, pyloric stenosis and gastroparesis. [6] Gastric bezoars, such as trichobezoars, typically occur in mentally incompetent persons who ingest their hair; however, a few reported cases of bezoars have been documented in mentally balanced persons.[7] Rarely, the events surrounding the ingestion of foreign bodies may not be entirely clear. [8]

We present the management of a plastic bottle cap bezoar in an elderly Nigerian man who was diagnosed during upper gastrointestinal endoscopy for epigastric pain. This report adds to the series of unusual gastric bezoars reported in the literature. The role of laparoscopy as a viable option in settings where endoscopic equipment for the extraction of foreign bodies from the stomach is unavailable is discussed.

Case Description

A 64-year-old man with well-controlled hypertension was referred from the Gastroenterology Unit to the surgical outpatient department of Lagos University Teaching Hospital in March 2023 with a two-month history of recurrent epigastric pain, positive faecal occult blood test and the finding of a foreign body (plastic bottle cap) in the body of the stomach on upper gastrointestinal endoscopy (UGIE)(Figure 1). The patient did not report weight loss nor features suggestive of diabetes mellitus. He had no history of mental illness. He is not a known alcoholic. Other findings at endoscopy were multiple areas of gastric erosions involving the corpus and the antrum. Gastric biopsies obtained at endoscopy revealed *Helicobacter*-like organism (HLO)-associated severe, active, chronic antral gastritis. Colonoscopy done for the same indication revealed a caecal diverticulum and a benign 2cm transverse colon polyp. No attempt was made to remove the plastic bottle during gastroscopy due to the lack of an appropriate endoscopic instrument for the procedure. He was then referred to the Surgeons for consideration of laparoscopic extraction of the foreign body.

Eight months later, he had an elective diagnostic laparoscopy, anterior gastrotomy and extraction of a plastic bottle cover with primary closure of the gastric incision.

Operative technique: The team employed three laparoscopic ports in this procedure. A primary trocar was inserted in the supraumbilical position using Hasson's method, and the abdomen was insufflated to 15mmHg. Secondary ports were placed under direct vision. A 5mm port was placed at about four finger breadths above the primary port, and the last 10mm port was inserted in the left hypochondrium. Diagnostic laparoscopy was performed, and about 8cm anterior gastrostomy incision along the longitudinal axis of the stomach from the body to the antrum was made using an L-hook electrode. The superior lip of the gastrostomy incision was retracted with an extracorporeal suture, which was passed through the anterior abdominal wall and knotted *ex vivo*. The lower lip of the gastrotomy incision was retracted caudally with the closed jaw of an atraumatic grasper. These manoeuvres widened the anterior gastrotomy incision for an easy passage of the 30-degree laparoscope and the right-hand instrument. The plastic bottle cover was found in the pylorus (Figure 2) and was extracted using a claw right-hand grasper. Anterior gastrotomy incision was closed with continuous all-coat suture using polyglactin zero suture (Figure 3). The plastic bottle cap was placed inside a bag of gloves fashioned as an improvised specimen retrieval

bag. The port site wounds were then closed in layers. The procedure was completed in 52 minutes. The patient's postoperative recovery was uneventful. Intravenous ceftriaxone, metronidazole and pentazocine were administered for 72 hours after surgery. Oral intake of fluids and food was commenced afterwards. He was discharged home on the fifth postoperative day. The patient has been followed up in the clinic for one year after surgery with no sequelae.

The patient was interviewed after his endoscopic diagnosis and after the surgery about events that surrounded his ingestion of the plastic bottle cover. He maintained that he was not aware that he swallowed the plastic bottle cover before the endoscopic diagnosis was made.

Declaration: Informed consent was obtained from the patient in writing, and he permitted the use of his data in this report

Figure 1: Gastroscopy showing a plastic bottle cap in the stomach

Figure 2: Intragastric laparoscopic visualisation of the plastic bottle cover

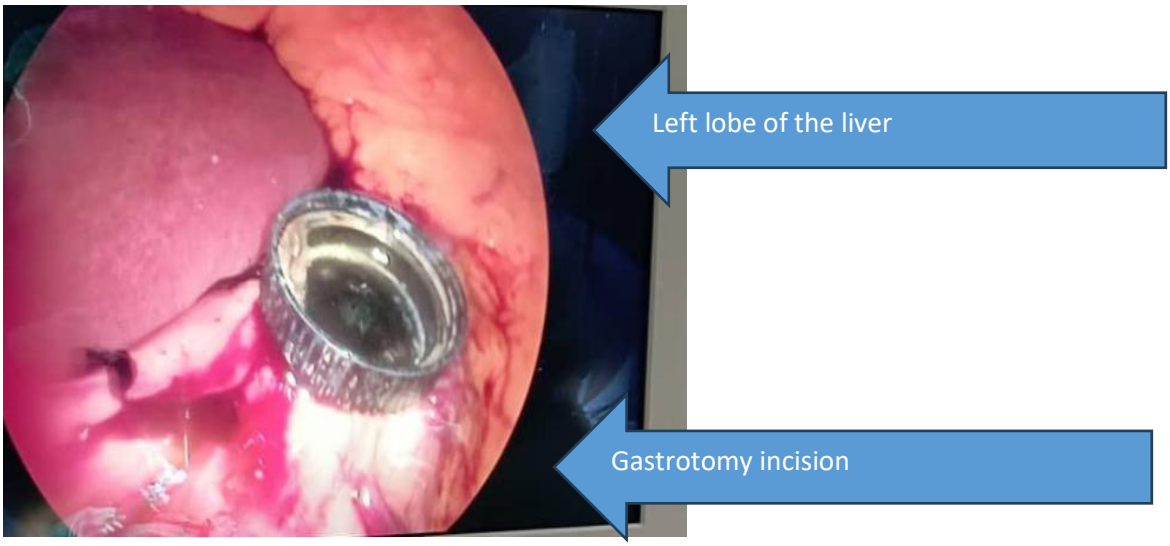

Figure 3: Plastic bottle cover extracted from the anterior gastrotomy incision

Discussion

The stomach serves as an initial receptacle for swallowed food. It also plays a principal role in digestion. The pyloric sphincter, which is the junctional area between the stomach and the duodenum, regulates the emptying of gastric contents into the duodenum. A gastric bezoar results from the accumulation of undigested or poorly digested food in the stomach. [9] Bezoars occur in many forms and are classified based on their contents, viz, phytobezoar, trichobezoar, lactobezoar and pharmacobezoar, to name a few.[9] Gastric bezoars of all types affect people of all ages.[9] In children, phytobezoars were reported as the most common aetiology in some series. [10-11] Same pattern occurs in adults, where phytobezoars constitute 40% of reported cases of bezoars. [12]

There is a paucity of reports of plastic gastric bezoars in medical literature.[13–17] Swallowed plastics have been known to cause a variety of gastrointestinal syndromes. Acute presentation occurs when they cause gastrointestinal bleeding, obstruction, or perforation with peritonitis. [1, 2, 18] There is a report of acute pancreatitis due to duodenal obstruction from swallowed plastic. [19] In the index case, the patient's presentation was delayed because he tolerated oral intake despite occasional epigastric discomfort.

Gastric bezoars are typically associated with a background history of mental or neurological disorders.[4,7, 8] Adejumo *et al.* [20] reported a large gastric bezoar in a female patient with schizophrenia and poor compliance with medical treatment. However, accidental ingestion of foreign materials by mentally competent persons has been reported.[21] In this presentation, the patient could not account for the circumstances preceding the ingestion of the plastic material, and this has remained a puzzle. He had no history of psychiatric disorder, and an independent assessment by the team of researchers showed no deficit in his mental capacity. He is learned and able to carry out his routine daily activities without any hindrance. His close associates had noted no change in his behaviour.

Few publications have reported that foreign materials accidentally ingested may pass through the gastrointestinal tract uneventfully. Such is

expected for smooth-walled objects like coins.[22]However, an ingested foreign body may be intercepted at junctional areas such as the oesophageal sphincters, the pylorus, and the ileocaecal segment of the gut. At surgery, this patient had plastic material lodged in the pre-pyloric area. This probably caused his intermittent epigastric pain. The solid nature and the larger size of the plastic cover relative to the pylorus may explain why it failed to transit beyond the pylorus. We were unable to determine whether the patient had an associated disorder of gastric emptying or gastroparesis. Some critical differential diagnoses in this case include gastric ulcer, gastric tumour and gastro-oesophageal reflux disease (GERD). These are commonly diagnosed with upper gastrointestinal endoscopy.

Endoscopic removal of a foreign body from the upper gastrointestinal tract is usually the first line of treatment for foreign objects located within the reach of the gastroscope. Snares, baskets, and grasping forceps, aided with caps, are used with overtubes in such cases for the retrieval of foreign bodies. In our situation, these accessories were unavailable, thus necessitating a referral for surgical intervention. Over the past few years, we have developed laparoscopic surgery for the treatment of a variety of abdominal pathologies. In this case, we leveraged the advantages of minimal access surgery, such as faster recovery time and better cosmetic scars. Laparoscopy is also a less morbid operation than conventional open surgery. The ability to perform a good laparoscopic intracorporeal suturing is *sine qua non* to the success of the laparoscopic mode of foreign body extraction from a hollow viscus.

The aftermath of Nirasawa's laparoscopic extraction of a gastric bezoar in 1988, some ensuing case reports have reported modifications of this procedure. In some of these cases, there are variations in the number of ports needed for intragastric bezoar access, the method of bezoar retrieval, and the use of single- or double-layer gastric closure.[23].A single solid gastric bezoar with blunt edges, as in this index case, may be easier to retrieve from the stomach using three ports: two working ports and a camera port.

Multiple, sharp-edged, or friable objects may cause gastric injury or break during extraction from the stomach, resulting in peritoneal contamination. This scenario requires the insertion of 4-5 working ports to facilitate retraction of the gastrotomy incision, retrieval of fragmented objects, timely suction of spilt gastric contents, and quick placement into the retrieval Endo bags to minimise peritoneal contamination.

Conclusion

This report highlights a rare cause of epigastric pain in an adult and underscores the utility of gastrointestinal endoscopy in the management of such cases. Laparoscopic retrieval of a foreign body from the stomach is a viable option when endoscopic facilities and expertise are not available.

Authors' Contributions: BOS conceived the study and did data curation with OEA, OGK and MA. BOS and MA drafted the manuscript. OEA and OGK revised the manuscript for sound intellectual content. All the authors approved the final version of the manuscript.
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