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CASE REPORT

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Gastric outlet obstruction due to an intragastric balloon in a patient returning from the Caribbean

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Key Clinical Message

Gastric outlet obstruction can be a dangerous complication of intragastric balloons, as it can result in severe metabolic alkalosis. As weight loss procedures and medical tourism become more popular, physicians should have a high index of suspicion for complications of invasive procedures, particularly in returning travelers.

Abstract

Intragastric balloons for weight loss have decreased in frequency in the United States. However, they are still frequent in low- and middle-income countries. Severe complications occur in less than 3% of patients who undergo this procedure. Herein, we present a case of gastric outlet obstruction, severe metabolic alkalosis, and refeeding syndrome in a patient returning from the Dominican Republic. She presented with 2 weeks of emesis and obstipation, followed by a pre-syncope and altered mental status. An intragastric mass was observed on computerized tomography, which was characterized as an intragastric balloon and retrieved endoscopically. All metabolic derangements were corrected, and the patient improved without sequelae. As weight loss procedures and medical tourism become more popular, physicians should have a high index of suspicion for complications of invasive procedures, particularly in returning travelers.

KEYWORDS

Allurion, *Elipse*, gastric outlet obstruction, intragastric balloon, metabolic alkalosis, weight loss

1 | BACKGROUND

Intragastric balloons (IGBs) are devices that occupy the stomach and delay its physiologic emptying. These devices are used for weight loss in patients with obesity as a bridge to bariatric surgery or in non-surgical candidates.[1] IGB placement is considered simple, well-tolerated, safe, and affordable.[2–4] However, more than 90% of patients report adverse events like nausea, vomiting, dyspepsia, and abdominal pain. Most symptoms are mild to moderate and improve within the first 2 weeks.[1,5–7] On the other hand, severe complications rarely occur, including gastric or esophageal perforation, pancreatitis, and obstruction.[1,2,5,7] Unplanned endoscopic intervention or early removal of

the IGB is necessary in less than 3% of cases.[1,5] Few cases of spontaneous IGB hyperinflation causing gastric outlet obstruction (GOO) have been reported.[3,7–9]

2 | OBJECTIVE

We present a case of severe metabolic alkalosis secondary to GOO in a patient returning from the Dominican Republic after an IGB placement for weight loss.

3 | CASE REPORT

A 51-year-old Hispanic female with no relevant past medical history presented to the emergency department after an episode of pre-syncope. She reported several days of lightheadedness, leading to a fall without loss of consciousness. She also reported 2 weeks of multiple episodes of non-bloody emesis, mild abdominal discomfort, and obstipation leading to a 20 lb weight loss. On physical examination, her blood pressure was 131/94 mmHg, heart rate 86 bpm, respiratory rate 16 bpm, oxygen saturation 99% on room air, and body mass index 24.5 kg/m^2. She was alert but her attention fluctuated. The physical examination was otherwise normal.

Initial laboratory tests showed sodium 121 mmol/L (reference 135–145 mmol/L), potassium <2 mmol/L (reference 3.1–5.3 mmol/L), magnesium 2.3 mg/dL (reference 1.6–2.6 mg/dL), phosphorus 1.2 mg/dL (reference 2.7–4.5 mg/dL), chloride <65 mmol/L (reference 98–110 mmol/L), pH >7.75 (reference 7.32–7.42), pCO_2 51.0 mmHg (reference 35–45 mmHg), HCO_3 >45.0 mmol/L (reference 22–29 mmol/L), BUN 48 mg/dL (reference 7–25 mg/dL), and creatinine 1.9 mg/dL (reference 0.5–1.1 mg/dL). EKG was notable for QTc 661 ms (reference <460 ms). A computerized tomography (CT) of the abdomen and pelvis showed a distended stomach with an intragastric mass measuring 11 cm, causing GOO (Figure 1).

Due to the severe metabolic derangements, she was admitted to the intensive care unit for monitoring and electrolyte repletion. A nasogastric tube was placed for gastric decompression. Upon prompting, the patient disclosed having an *Allurion*® IGB placed in the Dominican Republic 2 weeks prior. Two days later, the IGB was successfully retrieved via upper endoscopy, requiring intubation for airway protection. (Figure 2) Nutrition was slowly advanced due to signs of refeeding syndrome. Her mental status and EKG changes returned to baseline 5 days after the initial presentation. At that time, laboratory values were as follows: sodium 136 mmol/L, potassium 4.0 mmol/L, magnesium 1.3 mg/dL, phosphorus 1.8 mg/dL, chloride 106 mmol/L, pH 7.37, pCO_2 43.0 mmHg, HCO_3 24.9 mmol/L, BUN 12 mg/dL, and creatinine 0.79 mg/dL. The patient was discharged with oral potassium and magnesium supplementation. On follow-up 1 week later, all laboratory values had normalized.

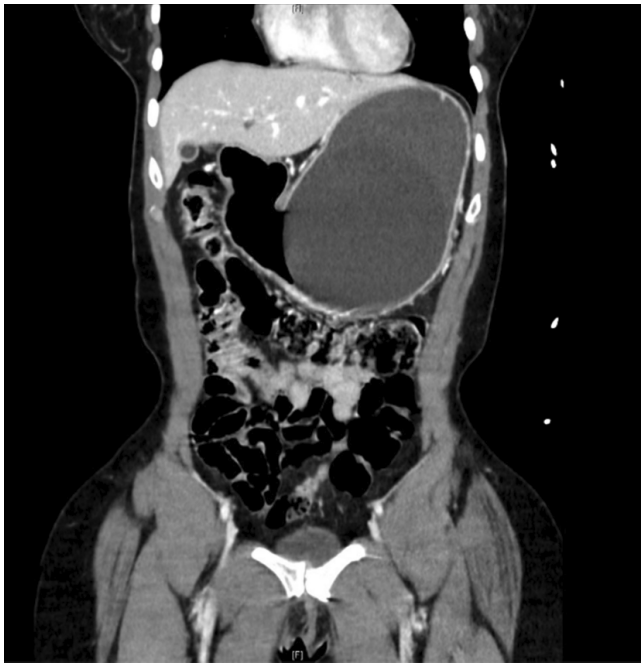

FIGURE 1 CT abdomen-pelvis showing an obstructing mass occupying the patient's stomach.

4 | DISCUSSION

Different IGBs are available for the treatment of obesity. These devices can be swallowed or placed endoscopically, and then inflated with air or sodium chloride once in the stomach. There are 4 Food and Drug Administration (FDA)-approved IGBs, all of which require endoscopic removal after 6 months due to the risk of deflation and migration.[1,2,10]

The *Allurion*® (formerly *Elipse*®) balloon was the first IGB that did not require endoscopic placement or removal. A capsule connected to a catheter is swallowed and once in the stomach, it is filled with 550 mL of fluid, with subsequent position and size confirmation by x-ray. The IGB deflates 4 months later through a self-opening valve and is eliminated through defecation. Since their introduction in 2015, self-deflating IGBs have become popular in Europe, the Middle East and Latin America. However, they do not have FDA approval.[4,10]

Several studies have investigated the *Allurion*® safety profile. Adverse events such as early expulsion via emesis, esophagitis, spontaneous hyperinflation, gastric dilation, GOO, gastric perforation, pancreatitis,

FIGURE 2 Intragastric balloon retrieved from the patient's stomach (measured in centimeters).

early deflation, delayed intestinal balloon transit, and small bowel obstruction have been reported in 1%–2% of cases. This safety profile is comparable to other IGBs.[3,4,11,12]

GOO is the mechanical blockage of gastric emptying, which presents with nausea, vomiting, abdominal pain and distention, early satiety, and/or weight loss.[6,13] Only 3 cases of GOO secondary to IGBs have been reported in the literature. Bomman et al. described a case of a patient who did not present to follow-up for IGB removal after 6 months of placement due to the COVID-19 pandemic restrictions.[8] Basile et al. reported a case of GOO 6 months after placement of an IGB which had spontaneously doubled its size[9] and De Quadros et al. described an acute abdomen with GOO due to IGB hyperinflation 3 months after placement.[7] In contrast to our case, these cases occurred with IGBs which required endoscopic retrieval after 6 months. Moreover, GOO occurred 3–6 months after IGB placement, whereas in our case, GOO occurred only 2 weeks after placement. The paucity of data about GOO secondary to self-deflating IGBs may be due to its novelty.

GOO led to severe metabolic alkalosis in our case, which was the presenting syndrome. Persistent emesis results in increased secretion of hydrogen ions into the gastric lumen, as well as HCO_3- into the bloodstream, causing a base excess.[14,15] Severe metabolic alkalosis (pH ≥7.55) is associated with significantly increased mortality in critically ill patients, and timely identification of the etiology is paramount. The initial therapeutic approach to GOO includes correction of electrolyte derangements, acid suppression (i.e., proton-pump inhibitors), and gastric decompression with a nasogastric tube.[13] The IGB drainage and retrieval should be pursued via upper endoscopy, with endotracheal intubation to prevent aspiration given the increased risk of balloon rupture associated with IGB hyperinflation.[6,7]

In conclusion, although infrequent, GOO can be a dangerous complication of IGBs, as it can result in severe metabolic alkalosis, with risk of fatal arrhythmias. As weight loss procedures and medical tourism become more popular, all physicians should have a high index of suspicion for complications of invasive procedures, particularly in returning travelers.

AUTHOR CONTRIBUTIONS

Maria Florencia Martins: Writing – original draft; writing – review and editing. **Alejandro De la Hoz Gomez:** Writing – review and editing. **Alan Manivannan:** Writing – review and editing. **Ayelet Shapira-Daniels:** Writing – original draft; writing – review and editing. **Christine Lee Campbell Reardon:** Supervision; writing – review and editing.

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DATA AVAILABILITY STATEMENT

Additional data from this case report is available from the corresponding author, MFM, upon reasonable request.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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