



## Case report

## Gastroscope-assisted laparoscopic sleeve gastrectomy: A case report with an unexpected old deflated intragastric balloon

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## ABSTRACT

**Introduction and importance:** Obesity has become a global health crisis and is now considered a pandemic. Intra-gastric balloons (IGB) can aid obese patients achieve a better effect of weight loss than medications while being noninvasive compared to surgical therapy.

**Case presentation:** We report a case of a 42-yr-old female with difficulty in losing weight even after three attempts of IGB and several diet programs. At the time of presentation, the patients BMI was 46.2 kg/m<sup>2</sup>. The patient experienced no gastrointestinal symptoms or stomach complaints and was found to have morbid obesity with hypertension and glucose intolerance.

**Clinical discussion:** Laparoscopic sleeve gastrectomy (LSG) was suggested for the patient. While performing LSG in association with a gastroscope, an unexpected old and deflated gastric balloon was found residing inside the stomach cavity. The rest of the surgery had no difficulty after the old gastric balloon was removed. The patients BMI post-LSG after 18 months was noticed to be 26.6 kg/m<sup>2</sup>.

**Conclusion:** We recommend performing gastroscopy prior to LSG for every patient with a previous gastric balloon insertion, especially if they had it more than once, to avoid potential complications during surgery.

## 1. Introduction

An exponential increase in obesity and its prevalence presents a serious threat to health across life course world-wide [1,2]. According to a recent survey by World Health Organization (WHO), it was estimated that more than 1.1 billion people will be obese by 2030. As 60% of today's world population is affected by obesity and overweight, the possibility of its treatment would be with changes in the diet and lifestyle [2]. Due to obesity, there is a steep increase in chronic non-communicable morbidities such as hypertension, obstructive sleep apnea, depression, diabetes, cardiovascular diseases, insulin resistance, gastroesophageal reflux disease, etc. [3,4]. However, a combination of lifestyle interventions (exercise and diet), pharmacologic treatment, and bariatric surgery (BS) have become reliable options for treating obese patients [5]. This increased inclination of overweight entities toward surgical approaches has led bariatric professionals to develop minimally invasive endoscopic strategies and novel procedures for effective treatment with safety [6]. Among several procedures that were developed, intragastric balloon (IGB) treatment was considered and suggested for

achieving an efficient and considerable results. The primary goals of IGB are weight reduction and recovery from accompanying comorbidities [7]. Gastric capacity restriction and malabsorption are the main factors that determine the outcome of weight loss surgery in BS management [7]. Data suggest that hormonal factors play a role in modulating weight loss success after BS, however, this has not yet been shown conclusively [8]. The Food and Drug Administration (FDA) of United States has permitted the use of three IGBs for treating obese patients with a body mass index (BMI) of 30–40 kg/m<sup>2</sup> [9]. Many IGBs made with silicone and polyurethane material are used, where most are filled with saline (250–900 ml) [7]. Several studies support and promote IGBs for losing weight more effectively in combination with diet and lifestyle changes [1,3,7]. Here, we report a case on an inadvertent discovery of an old IGB during sleeve gastrectomy.

## 2. Case presentation

A 42-year-old female patient appeared at our bariatric clinic with a long-standing problem of obesity and weight gain. The patient reported

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that despite various low-calorie diet programs and three previous IGB implantation procedures (which were performed out of the country without proper documents or reports) at 3 separate medical facilities (the last balloon insertion was two years before her presentation), a satisfactory outcome was not obtained. The patient reported the removal of all the three balloons prior to her presentation to our center. She was morbidly obese and had a history of hypertension and glucose intolerance, as examined by our multidisciplinary team. At the time of presentation, the patients BMI was 46.2 kg/m<sup>2</sup>. According to our local hospital protocol (as per IFSO guidelines), her initial workup included behavioral, nutritional, cardiac, and pulmonary assessment, where an echocardiogram, chest x rays, ECG, and blood examinations were performed. The patient did not extant any gastrointestinal symptoms, specifically gastroesophageal reflux, or any other upper gastrointestinal tract complaints at presentation.

The patient was advised of surgical therapy and options to treat her obesity, and she proceeded with laparoscopic sleeve gastrectomy (LSG). The hospital formalities were followed and the consent was obtained from the patient and was instructed and educated on aspects of procedures and lifestyle changes before and after surgery, evaluation and education by dietitians and behavioral therapy. The patient was admitted the night before her surgery and transferred to the Operating Room, where she was placed in a lithotomy position. After dissecting the Omentum and other attachments from the stomach, the intragastric calibration tube 36 Fr size was placed by an anesthetist and guided to pass it down to the duodenum.

Sleeve gastrectomy was performed as usual by stapling the stomach with a linear stapler 2 to 5 cm away from the pylorus and then moving in a cephalic direction toward the upper stomach. Post firing of the second stapler, a moving mass was felt within the gastric lumen that could be easily pushed lateral side of the stomach and away from the staple line alignment. However, to have a safer approach, visualization of the gastric lumen was performed by gastroscopy and then gastric stapling was performed. When the gastroscope was inserted and advanced into the gastric cavity, and we found an old and deflated gastric balloon inside the stomach cavity with free mobility. We proceeded to advance the old balloon inside the cavity of the already transected part of the stomach rather than trying to extract it with endoscopic forceps, preventing the tear and further fragmenting of the old balloon. This work has been performed with respect to SCARE 2020 guidelines [10]. The rest of the surgery went smoothly and the excised stomach that contained the old balloon was easily removed. The excised stomach was then opened and the old deflated gastric balloon was removed from the lumen (Fig. 1).

The patient was instructed to follow the post-BS diet starting with sips of clear liquids, gradually advancing to the normal diet, accompanied by daily exercise. Furthermore, it was advised to visit the clinic

regularly, while a multidisciplinary evaluation was recommended as an outpatient at the 2nd and 8th week, then 4th, 6th, 12th, and 18th months, then annually after surgery. The follow-up evaluation was done after 18 months after surgery and we found that the patient had lost 86% of her excess body weight and did not report any additional complications. The patients BMI after 18 months of LSG was noticed to be 26.6 kg/m<sup>2</sup>.

### 3. Discussion

Since the 1980s, gastric balloons have been used to reduce weight in people who are not candidates for BS or as a bridge intervention before BS in cases of comorbidity [11]. However, gastric balloon usage was reported for the development of various side effects, including small intestinal blockage with deflation and injury to gastric mucosal tissues [7]. After decades of development, IGB devices are now more effective, safe, and less traumatic than ever before while maintaining the benefits of reversibility and without altering the anatomy of the gastrointestinal system [12]. IGBs are associated with a lower mortality (<1%), long-lasting, effective excess weight loss (EWL) percentage greater than 50%, fewer adverse effects, reversible and reproducible, and good quality of life [13]. However, Italian research revealed that BioEnterics intragastric balloon (BIB®) therapy for 14 months provided greater results with higher weight reduction than BIB® in situ within 6 months without complications [14]. However, in our current case study, the patient did not lose significant weight even after three IGB placements. An unexpected observation that we made was the presence of an old deflated gastric balloon in the stomach cavity. Here, our patient had a silicone saline balloon which should stay for 6 months inside the stomach, as suggested earlier by Buzga et al. [15]. These spherical IGBs allow the addition or removal of saline in situ, allowing patients to customize their intragastric volume to fit their weight loss goals and preferences [13].

LSG has gained popularity around the world in terms of obesity management, especially in people with a BMI between 40 and 45 kg/m<sup>2</sup>, due to its excellent resolution of comorbidities and its low rates of morbidity and mortality [16,17]. In a pivotal study ( $n = 264$ ) by Ponce et al. [18], it was noticed that the use of ReShape Duo IGB implant reduced the symptoms of nausea, stomach discomfort, and vomiting among the patients. However, about 6% of the patients had spontaneous IGB deflation. A 6-month follow-up indicated a promising reduction in EWL of approximately 31.8% in the treated group, while the control group showed a reduction of 18.3% [19]. In our current case study, the patient had no gastrointestinal symptoms or gastric complaints at the time of the presentation. A follow-up of the patient after 18 months suggested a complete recovery after surgery and a decline of EWL to 86%. After three IGB procedures, our patient still had an old deflated

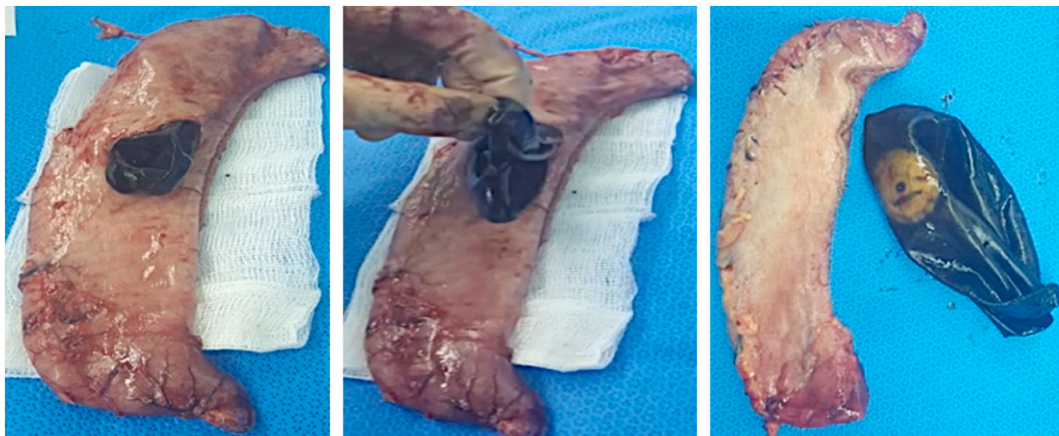


Fig. 1. Excised stomach with an old deflated gastric balloon.

gastric balloon in her stomach, which created a surgical risk. However, at the time of presentation, the patient confirmed the removal of all her previous balloons. However, after her surgery findings and in a retrospective inquiry, she indicated that due to the long period and multiple endoscopy procedures she had experienced, she may have had a recall problem and assumed that the last balloon was removed. In patients with a BMI of 50 kg/m<sup>2</sup>, Milone et al. [20] found that LSG outperformed IGB placement in terms of mean weight reduction (45.5 vs. 22.3 kg) and EWL% in patients (35 vs. 24%). Patients who are severely obese can effectively lose weight using LSG. Endoscopic results may be beneficial for diagnosing both lesions and inflammation due to the weak association between patient symptoms and endoscopic findings [2]. As suggested by Mihmanli et al. [20] nearly 54% of obese patients had a condition that required preoperative care and recommended gastroscopy prior to BS [21].

In this case presentation we advocate and stress on the need for performing upper gastrointestinal tract scope for all bariatric patients who have had any endoscopic procedures in the past specifically gastric balloon therapy including the self-removed balloons, which can dissolve and expelled from gastrointestinal tract. This is the only reported case of a sleeve gastrectomy with the incidental finding of an old, left in place IGB. We recommend performing a gastroscopy prior to LSG for all patients who underwent prior gastric or balloon procedures.

#### 4. Conclusion

Although IGB can aid obese patients in achieving better effects of weight loss than medications, bariatric surgery has been considered more effective and a longer-term solution for the management of morbid obesity. When preparing morbidly obese patients for BS, we advocate clinicians to consider prior IGB therapy as a strong indication for performing gastroscopy to avoid potential challenges or complications during bariatric surgery.

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#### Ethical approval

All the ethical standards were followed during our case study and the authors have read and comprehended the manuscript.

#### Consent

Written informed consent was obtained from the patient for publication report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Research registration

This case report is registered with Research Registry with the reference no researchregistry7861.

#### Guarantor

Azzam Alkadi.

#### Provenance and peer review

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#### CRedit authorship contribution statement

Study concept, design, data extraction, and the organization and writing of manuscript draft was done by Azzam Alkadi.

#### Declaration of competing interest

The author claims no conflict of interests.

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