

# Intestinal Obstruction as a Rare Complication of Intra-gastric Balloon: A Case Report

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## ABSTRACT

Obesity is a global health problem with increasing prevalence. Its treatment is very important due to associated morbidity and mortality. Obesity surgery gives satisfactory results with high success rates. However, a less invasive method such as gastric balloon may be preferred in patients with high surgical risk or in patients who prefer non-surgical methods for weight loss. Although it is an endoscopic and safe procedure, there is a risk of serious complications. Perforation, bleeding, and obstruction are common complications. In this case report, we discuss this issue with a patient who developed intestinal obstruction after gastric ballooning.

**Key Words:** Intra-gastric balloon, Obstruction, Obesity.

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## INTRODUCTION

An unbalanced calorie intake leads to the accumulation of excess fat in the body, which is a complex disease known as obesity.<sup>1</sup> It is defined as a body mass index (BMI) greater than 30 kg/m<sup>2</sup>. The global incidence of this phenomenon has risen during the past four decades. Morbid obesity is characterised by a BMI of >40 kg/m<sup>2</sup>. Morbid obesity is often accompanied by several obesity-related health problems, including hypertension, coronary heart disease, sleep apnoea, osteoarthritis, and diabetes. Therefore, the importance of its treatment cannot be ignored. Bariatric surgery is being increasingly conducted due to its ability to achieve the necessary weight reduction.<sup>2</sup> Nevertheless, alternative non-surgical approaches can also be employed. The intra-gastric balloon is one of these techniques. The utilisation of the present balloon was established and implemented following a consensus reached at the Obesity and Gastric Balloon Conference in 1991. Various intra-gastric balloon devices have been introduced since 2015.<sup>3</sup> The balloon is typically inserted into the stomach using endoscopy and remains there for an average duration of 6 months, with regular follow-up appointments for the patient. Potential severe effects encompass perforation, balloon migration, and death. The balloon migration rate is approximately 1.4%.<sup>4</sup>

With this case report, we aimed to discuss this rare complication of intra-gastric balloon.

## CASE REPORT

A 44-year woman with a BMI of 38.2 kg/m<sup>2</sup> presented with a request for intra-gastric balloon procedure. The patient received endoscopy-guided gastric balloon application and was scheduled for regular outpatient clinic visits. There was a consistent weight decrease during the follow-up period. After a period of 5.5 months following the procedure, she presented with symptoms of nausea, vomiting, and stomach pain characterised by cramping, which had persisted for 12 hours. The patient's vital signs were stable.

Physical examination revealed mild abdominal distension and tenderness in the suprapubic region. Bowel sounds were decreased. There was no evidence of ischaemia. Plain abdominal film showed a radio-opaque object close to the tubal clip in the lower abdomen. The patient underwent a quick gastroscopy and the balloon was not in the stomach. Computed tomography (CT) scan revealed the presence of a partially deflated balloon in the distal small intestine, thickened intestinal wall, and dilated proximal intestines (Figure 1 A, B).

The patient was taken to emergency surgery. During the exploration, a gastric balloon, which was not fully deflated, was causing a total blockage and temporary ischaemia in the jejunum (Figure 2). A small incision was made in the balloon and its contents were aspirated and the balloon was taken out of the jejunum (Figure 3). When checked externally, a pinpoint-sized perforated area and fluid leakage were observed on the balloon wall in the opposite direction of the valve. Jejunotomy was repaired horizontally with 4/0 PDS using the Gambee suture technique. Nasogastric tube was removed on the first day of postoperative follow-up, and oral intake was commenced on the second day. The patient was discharged on the 5<sup>th</sup> day without any complications.

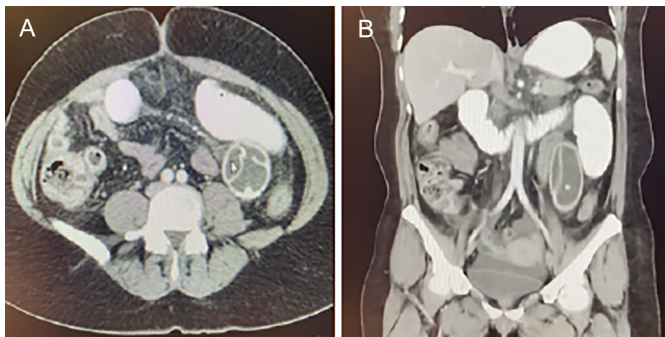
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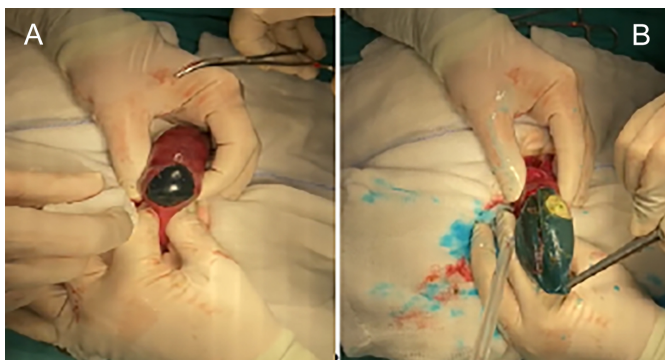
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**Figure 1:** CT scan of the patient. (A) View of the gastric balloon in the jejunum in axial section and (B) coronal section (arrows).



**Figure 2:** Gastric balloon causing temporary ischaemia in the jejunum.



**Figure 3:** Removal of the gastric balloon from the jejunum. (A) Jejunotomy at the site of the gastric balloon. (B) Removal of the balloon.

## DISCUSSION

Obesity is a prevalent health issue that is becoming more common. Based on the 2014 statistics, 39% of adults aged 18 years and above were classified as overweight, while 13% were categorised as obese. It was estimated that the occurrence of obesity was 11% among males and 15% among females.<sup>5</sup> Türkiye has the highest rate of obesity among all countries in the World Health Organization (WHO) European Region, as stated in the WHO European Region Obesity Report 2022.<sup>6</sup> The prevalence of overweight among adults in Türkiye is 66.8%, while the obesity rate is 32.1%.<sup>6</sup> The treatment of this condition is crucial for enhancing the management of chronic illnesses, decreasing death rates, and preventing a decline in the workforce. The rise in obesity has led to a boom in the popularity of

bariatric surgery, which is the most efficient approach for achieving long-lasting weight loss in suitable individuals. While bariatric surgery is often regarded as the most efficacious approach to addressing morbid obesity, there may be certain limitations for patients seeking surgical intervention. Therefore, less invasive techniques are commonly used in addition to surgery. Examples of these are intragastric balloon and gastric botox procedures. In addition to patient demand, these strategies can also be used to facilitate weight loss to reduce the preoperative risk associated with high-risk surgeries.

Intragastric ballooning has been practised for almost two decades. Typically, intragastric balloon therapy is expected to result in a reduction of 8 to 15% of the entire body weight in the short term, but bariatric surgery might lead to a total body weight loss ranging from 13 to 30%.<sup>7</sup>

The intragastric balloon induces weight loss using a restrictive mechanism. Typically, it is positioned to cover around one-third of the stomach, therefore limiting the amount of food that may be consumed. The balloon is usually inflated by introducing saline methylene blue dye into it. This allows for the detection of a puncture in the balloon by observing a change in the colour of the urine. In the observed patient, the small size of the hole in the balloon prevented it from entirely emptying, resulting in an insufficient amount of methylene blue passing into the blood and no visible blue staining of urine.

Gastric balloons are manufactured from different materials such as silicone or polyurethane. They are kept in the stomach for an average of six months to one year. Upon completion of their stay, they are either extracted endoscopically or undergo perforation due to interaction with digestive enzymes and are subsequently expelled from the gastrointestinal system. When it is punctured, it is completely emptied and its volume is reduced, so there is no obstacle to its progress in the intestines. In the present patient, the balloon was able to pass through the pylorus, although its volume was not completely reduced. As its tension dropped, it was able to move towards the distal jejunum, leading to obstruction.

Pre-recognition of the millimetric defect causing partial deflation of the gastric balloon rather than complete perforation may prevent such a complication, but it should be kept in mind that this may also be due to gastric acidity after the procedure.

Abdominal pain, nausea, and vomiting are common symptoms experienced by almost 90% of patients in the initial phase following gastric ballooning. However, complaints usually resolve after the first week.<sup>8</sup> Ulceration, perforation, and intestinal obstruction can be seen as significant consequences. Furthermore, the balloon can lead to stomach distension, which may result in the development of acute pancreatitis.<sup>9</sup> The patient initially presented with cramping stomach pain and intermittent vomiting, but these symptoms gradually improved with dietary modification and medical treatment. The recurrence of similar problems in the 5<sup>th</sup> month following gastric ballooning suggested a new balloon-related pathology. Control

gastroscopy showed that the balloon was not in the stomach and it was thought to have progressed distally. Cross-sectional imaging revealed that the intragastric balloon had progressed to the jejunum and caused obstruction. Obstructive complication is more commonly seen in patients in whom the balloon remains in the stomach longer than it should, which was not the case in the present patient.

The gastric balloon procedure carries the risk of complications, both during the insertion and removal stages. Examples of complications include oesophageal perforation, gastrointestinal haemorrhage, and pneumonia. A study by Genco *et al.* recorded a mortality rate of 0.05%.<sup>10</sup> Mortality rates decrease when these complications are recognised during the procedure.

After the gastric balloon procedure, the sudden onset of symptoms such as abdominal pain, nausea, and vomiting requires a detailed examination. Although rare, intestinal obstruction due to migration of the gastric balloon should be kept in mind.

#### PATIENT'S CONSENT:

Informed consent was taken from the patient.

#### COMPETING INTEREST:

The authors declared no conflict of interest.

#### AUTHORS' CONTRIBUTION:

SEB: Design, writing, and collecting data.

AK: Collecting data and writing.

SB: Writing and analysing references.

CB: Collecting data.

All authors approved the final version of the manuscript to be published.

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