



# Indications and Uses of the Intra-gastric Balloon

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## Introduction

Current therapeutic approaches to obesity are lifestyle changes, pharmacologic treatment, and bariatric surgery. Bariatric surgery has proven to provide the most sustained and effective method for weight loss. However, only 1% of obese patients eligible for the surgical procedure choose to undergo it. The major issues with surgery are difficult access, high costs, patient non-preference, and potential morbidity and mortality [1].

The increased prevalence of obesity has motivated experts in bariatric medicine to advance in minimally invasive endoscopic treatment for obesity management. Abu Dayyeh et al. published a recent meta-analysis proving the efficacy of endoscopic obesity treatment combined with a multidisciplinary treatment plan [2].

The intra-gastric balloon technique has become an effective method of achieving weight reduction in obese people. The device allows an early feeling of satiety, which is thought to be a consequence of gastric distention. This mechanical intra-gastric distention during meal time also significantly decreases the amount of food intake [3].

## Indications and Contraindications for Gastric Balloon Insertion

Intra-gastric balloon therapy is an option for obese patients with a body mass index (BMI) equal or greater than 30 kg/m<sup>2</sup> in the United States (US), who have tried and failed previous attempts at weight management with diet and exercise alone, in one of the following situations:

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- For patients with a BMI of 30–35 kg/m<sup>2</sup>, intragastric balloon therapy may be used as an early intervention to induce weight loss or to prevent and treat obesity-related medical comorbidities [4].
- For severely obese patients, such as those with a BMI greater than 50 kg/m<sup>2</sup>, intragastric balloon therapy may be used as a bridging intervention prior to bariatric surgery. These patients would be at risk of developing anesthesia-related complications during surgery or technical difficulty due to hepatomegaly or increased intra-abdominal fat [5].
- For patients who are eligible to bariatric surgery but refuse it and consider it “too risky,” or those who lack access to facilities providing bariatric surgery; intragastric balloon can be used as an alternative method to induce weight loss.

## Contraindications of Intragastric Balloon

Both absolute and relative contraindications for intragastric balloon are in Table 3.1.

## Uses and Application of Intragastric Balloon in Obese Patients

### Body Weight Loss

In comparative studies of the Orbera® balloon (Apollo Endosurgery, Inc., Austin, TX, USA), Giardiello et al. and De Castro et al. indicated that the mean weight loss associated with IGB therapy ranged between 10.5 and 13.7 kg after 3 months, and between 12 and 26.3 kg after 6 months [6, 7].

Additionally, the initial body weight loss (BWL) following intragastric balloon placement was associated with significant long-term weight maintenance as shown in the Dogan et al. study [8]. The percentage of BWL 1 month after intragastric balloon placement was significantly associated with weight loss after 6, 12, and 18 months.

Saber et al. showed in a meta-analysis that BMI loss was 1.59 and 1.34 kg/m<sup>2</sup> for overall and 3 month, respectively; EWL was 14.25 and 11.16% for overall and

**Table 3.1** Absolute and relative contraindications for intragastric balloon [5]

Absolute contraindications	Relative contraindications
Previous gastric surgery	Previous abdominal surgery
Coagulation disorders	Large hiatal hernia
Bleeding lesion in the upper gastrointestinal tract	Inflammatory bowel disease
Pregnancy or desire to become pregnant during treatment	Chronic nonsteroidal anti-inflammatory drug (NSAID) use
Alcoholism or drug addiction and severe liver disease	Uncontrolled psychiatric disorders

3 month, respectively; and weight loss was 4.6 and 4.77 kg for overall and 3-month weight loss, respectively [9]. They also showed a significant effect size that favored fluid-filled IGBs over air-filled intra-gastric balloon [9].

### **Improvement in Obesity-Related Comorbidities and Metabolic Diseases**

Crea et al. assessed 143 obese patients after insertion of Orbera® balloon with 12-months follow-up. They found that the incidence of metabolic syndrome declined from 34.8% (before balloon insertion) to 14.5%, 13%, and 11.6% at the time of removal, at the 6-month follow-up, and at the 1-year follow-up, respectively [10]. Likewise, the occurrence of hyperuricemia, hypertriglyceridemia, and hypercholesterolemia decreased from 26.1%, 37.7%, and 33.4% to 25.4%, 14.5%, and 16.7%, respectively. At the time of removal, 25.9%, 15.2%, and 16.7%, respectively, at the 6-month follow-up, and 26.4%, 17.4%, and 18.9%, respectively, at the 1-year follow-up [10].

Similarly, in a large multicenter European study, Genco et al. mentioned that the percentage of patients with comorbidities at baseline and at the 3-year follow-up was 29% and 16% for hypertension, 15% and 10% for diabetes mellitus, 20% and 18% for dyslipidemia, 32% and 21% for hypercholesterolemia, and 25% and 13% for osteoarthritis, respectively [11].

A randomized controlled study showed that intra-gastric balloon therapy improved the histology of nonalcoholic steatohepatitis [12].

### **Alteration in Gastrointestinal Hormones**

A study with 40 obese patients who underwent balloon placement indicated no effect on ghrelin levels when patients were fasting or meal-suppressed [13]. In another study, 17 patients with nonmorbid obesity underwent balloon placement, and fasting plasma ghrelin concentrations significantly decreased (3.2–1.9 ng/mL;  $P = 0.021$ ) [14].

Mathus-Vliegen et al. evaluated fasting and postprandial cholecystokinin and pancreatic polypeptide secretion after 13 weeks of balloon treatment in 42 obese patients. Baseline and meal-stimulated cholecystokinin levels were decreased [15].

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## **Conclusion**

Intra-gastric balloon is showing a promise in improving lifestyle and weight loss in obese patients. It offers a minimally invasive and effective method for managing obesity and associated conditions. It can be used as a bridging step for super-obese patients to lose weight and to improve obesity-related comorbidities.

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