

# Gastric Perforation as a Complication after BioEnterics Intra-gastric Balloon Bariatric Treatment in Obese Patients—Synergy of Endoscopy and Videosurgery

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**Abstract** The BioEnterics intra-gastric balloon (BIB) is one of the most common bariatric procedures in obese patients in Europe. Associated gastric perforation is a rare, yet very dangerous, complication. We report a case of such a complication after BioEnterics intra-gastric balloon insertion in a 60-year-old female patient and subsequent cooperation between an endoscopist and bariatric videosurgeon in her treatment.

**Keywords** Gastric perforation · Morbid obesity · Laparoscopy · Endoscopy · BIB · Synergy of endoscopy and surgery

## Introduction

In Europe, 25–75% (about 400 million) people are overweight (BMI 25–29.9). Thirty percent (130 million) of the Europeans suffer from obesity (BMI > 30). In 2010, there will be more than 150 million obese Europeans. The mean BMI of a European citizen amounts to 26.5 (the WHO data of 2006). In the highly developed countries, obesity creates a reason for 20% of deaths among women and 14% among men.

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In Poland, obesity becomes a more and more serious medical, social, and economic problem. Due to various data gathered in 2006, there were about 55–60% overweight people, out of whom 12% were obese. Actually, surgical treatment of obesity seems one of the most effective methods of treating such diseases [1, 2]. In Poland, laparoscopic adjustable gastric banding (LAGB) is the most commonly performed procedure, whereas the Roux-en-Y gastric bypass surgery is not as popular. However, a planned surgical procedure is often preceded by BioEnterics intra-gastric balloon (BIB) insertion [1, 3]. Indications for different groups of bariatric operations are rather well specified, but a decision about performing an operation is usually taken together with a patient, as it is described in the case below.

## Case Report

A 60-year-old female (case history no. 17852/08) was admitted to hospital on 19th October 2008 for the planned BIB insertion. On being introduced various obesity treatment methods, the patient chose the balloon insertion for the first stage as the least invasive sort of treatment in her opinion. The conducted interview revealed: arterial hypertension for 30 years, diabetes mellitus for 20 years, stable diseases, medicines being taken, Cesarean section 34 years ago, and BMI of 35.7 (height 169 cm, weight 102 kg). No other complaints were presented. A physical examination and additional tests were performed: blood tests (WBC 11.34, RBC 4.53, HGB 13.3, PLT 348, INR 0.94, Glucose 235 mg/dL, Urea 40 mg/dL, Creatine 1.19 mg/dL, Na 139 mmol/L, K 5.1 mmol/L, Cl 97 mmol/L) as well as a gastroscopic examination, which indicated no deviations.

The patient was qualified for the balloon insertion on 20th October 2008. The balloon was inserted endoscopically on 20th October 2008. Since no complaints had been notified she was discharged from the hospital on 21st October 2008. The patient was prescribed antiemetic drugs: Torecan and a proton pump inhibitor (PPI) Omeprazol.

On the 5th day after the balloon insertion, the patient reported for control tests. She complained about a feeling of fullness and nausea after meals. Abdominal ultrasonography showed the balloon in its correct position. After another interview with a dietician, the patient was sent home.

On the 9th day following the balloon insertion, the patient notified diffused pain in the stomach since the previous day. The physical examination confirmed the pain localized in the epigastric region accompanied by some peritoneal symptoms. The patient was admitted to the clinic on 29th October 2008 (case history no. 18553/08). A perforation of the alimentary tract was determined due to X-ray images taken when the patient was lying down and standing up. Other additional tests documented leukocytosis 18,900/mL. The patient was qualified for an emergency procedure.

The procedure commenced with exploratory laparoscopy. A video was introduced into the peritoneal cavity. The perforative opening measuring approximately 6 mm was found in the anterolateral wall, in the upper part of the fundus, near the greater curvature of the stomach. The peritoneal cavity was monitored. No chyme was found. Next, the endoscope was introduced into the stomach through the oral cavity. The BIB was found intact. Due to the lack of good visibility in the gastric lumen, the decision was taken to puncture the balloon and remove the fluid. After the fluid decompression, the visibility was still poor—lack of insufflation. Temporarily, the stomach wall was sealed from the peritoneal side with two clips and two graspers. The tightness of the perforative opening was duly affirmed. Meanwhile, a complete gastroscopy was performed by the endoscopist who controlled the gastric wall—no other injuries were noted beyond the perforation region. The BIB was removed from the stomach through the esophagus by the endoscopic loop. The patient then underwent peritoneal lavage. The stomach was sutured laparoscopically from the peritoneal cavity side with double-tract interrupted sutures. The tightness of the sutures was checked endoscopically. No leaking was detected. The whole peritoneal cavity was controlled again, and having found no deviations, the procedure was regarded completed.

On the third day following the procedure, a radiological test of the gastric tightness was performed—no leaking was detected. The diet was expanded. The patient was in good condition, no complaints made, and no analgesic drugs, full diet, and discharged on the sixth day after the procedure—5th November 2008.

A control gastroscopic examination was performed 4 months after the procedure, showing no other changes

in the gastric mucosa apart from the suture scar. The patient was qualified for further bariatric treatment with the LAGB. Another gastroscopy was conducted—neither inflammatory symptoms nor defects were found. The banding was placed 6 months after the perforation. The patient remains under control of the Bariatric Outpatients' Clinic. Presently, she participates in another randomized bariatric study.

## Discussion and Conclusion

The BIB is one of the most common bariatric procedures in obese patients in Europe and in the world [1, 2]. Opinions about the balloon insertion vary; therefore, the whole medical community seeks other solutions for the obesity treatment [4, 5]. However, expected outcomes are not always satisfactory for the patient and doctor.

Attempts are undertaken to use the balloons in various disease entities related to obesity [6–8]. Similarly to other medical tests, the balloon insertions can also be followed by complications. Gastric perforation is a rare complication after such procedures yet very dangerous [9]. The case of the 60-year-old female patient was reported; however, first of all, we focused on the cooperation between the endoscopist and surgeon in the bariatric treatment.

Both the bariatric surgeon and endoscopist faced a few still unknown challenges:

- What sort of procedure should be performed not knowing the place of perforation?
- How should the procedure be performed considering the least possible operative trauma and the highest efficacy?
- Should the procedure be started endoscopically or surgically?
- If the procedure is started surgically, shall it be laparoscopy or laparotomy?
- How should the methylene be removed from the balloon?
- How should the balloon be removed from the perforated stomach?
- Should the endoscopic trial be taken in order to remove the balloon when there is no possibility of gastric insufflation?
- Should the balloon be removed via the widening of the perforative opening in the stomach?
- Should the balloon be removed via the iatrogenic incision of the gastric wall?
- Should the balloon be removed laparoscopically or laparotomically from the peritoneal cavity?
- How should the perforative opening be sutured?

The above and several other issues are still awaiting their answers before the procedure is commenced. Fortunately for both sides in the described case, a combined, still the least invasive, treatment could be applied (surgery and endoscopy).

Due to the careful professional work of the whole medical team, the patient could leave the hospital in good condition, without complaints, on her abdomen having three scars of 40 mm total length (two ports of 12 mm and one port of 5 mm). The duration of her stay in hospital (she stayed until the full diet could be introduced) resulted from our concern about her health condition and from the fact that we had to fix the complication. Due to such a surgical and endoscopic procedure (we did not manage to find a similar example in literature) in the patient, it was possible to perform another laparoscopic procedure (LAGB) 6 months after this event. After classical operations, further laparoscopic procedures might have been seriously hampered.

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