



Gastric Perforation by Intra-gastric Balloon

23

Victor Ramos Mussa Dib, Lyz Bezerra Silva,
and Josemberg M. Campos

Introduction

The implantation of an intra-gastric balloon as part of the treatment for obesity is a minimally invasive therapy originally proposed by Nieben and Harboe in the 1980s [1, 2].

In spite of the noninvasive nature of the procedure, complications may sometimes occur, such as intolerance, gastric obstruction, gastric ulcer, and gastric perforations [3]. Their occurrence motivated the holding of a conference in 1987, which established the basic requirements for an intra-gastric balloon, one of which was that it should have a very smooth surface with little propensity to cause ulceration [4].

Although the balloons used today are very safe, they are not entirely free from the risk of complications [5]. Here, we describe a case of gastric perforation in the presence of an intra-gastric balloon and its treatment using laparoscopy.

V. R. M. Dib (✉)

Department of Surgery, Victor Dib Institute, Manaus, AM, Brazil

L. B. Silva · J. M. Campos

Department of Surgery, Federal University of Pernambuco, Recife, PE, Brazil

© Springer Nature Switzerland AG 2020

M. Galvao Neto et al. (eds.), *Intra-gastric Balloon for Weight Management*,
https://doi.org/10.1007/978-3-030-27897-7_23

165

Clinical Case

A woman, BMI 28.7 kg/m², was submitted to the implantation of an intragastric balloon (Silimed®, Rio de Janeiro, Brazil). She progressed satisfactorily during the entire period of monthly medical and multidisciplinary follow-up and lost 14 kg. A proton pump inhibiting drug was prescribed for as long as the balloon was in place, but administration was suspended in the fifth month in accordance with the protocol adopted by the clinic. Toward the end of the treatment period, a little before the planned removal of the balloon, the patient suddenly experienced acute epigastric pain and had to be hospitalized and treated with opioids.

Laboratory exams, thorax, and abdominal X-ray showed no alterations. Also, an abdominal ultrasound was performed, with no abnormal findings.

An endoscopy was then performed, which showed difficulty to stretch the stomach for the deflation maneuver and impossibility of assessing other alterations due to the presence of the balloon, and removal of the intragastric balloon was performed.

At the end of the endoscopic examination, the clinical examination detected an intense abdominal distension consistent with pneumoperitoneum, which was confirmed by an X-ray of the abdomen. A new upper gastrointestinal tract endoscopy was performed and a perforated ulcer on the anterior wall of the stomach was detected.

A laparoscopy was then performed, which showed an oval, straight-edged perforation on the anterior wall of the stomach with a diameter of approximately 15 mm (Fig. 23.1) and a small amount of serofibrinous secretion in the cavity. The lesion was sutured with individual stitches using polypropylene 3.0 thread (Fig. 23.2), and epiploonplasty and rinsing/aspiration of the cavity were done (Fig. 23.3).

The patient progressed satisfactorily and was discharged from the hospital 48 hours later, remaining asymptomatic on follow-up.

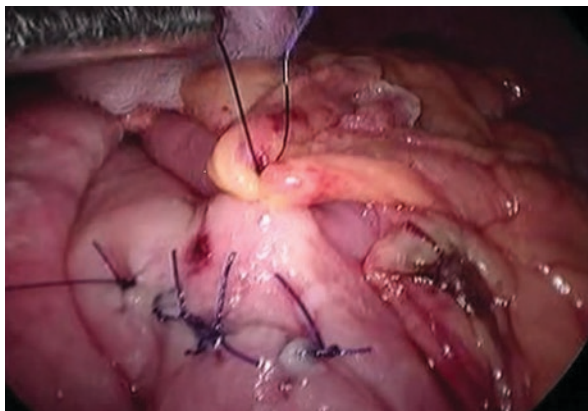
Fig. 23.1 Laparoscopic view of the perforation in the anterior gastric wall



Fig. 23.2 Suture of the lesion with individual stitches of 3.0 polypropylene thread



Fig. 23.3 Omental patch



Discussion

The formation of ulcers and gastric erosions in the presence of an intra-gastric balloon can be associated to irritation of the stomach wall and cytoprotection failure, secondary to the production of prostaglandins by the mucosa. The presence of food residues squeezed between the wall and the balloon and/or the irregular surface of the balloon valve may create a zone of high pressure and ischemia and eventually culminate with a perforation, albeit that complication is rare [6].

A history of previous gastric surgery with the associated reduction in the organ's complacency constitutes a definitive contraindication for the placement of an intra-gastric balloon [3, 7]. In a series of 2515 patients, only 5 presented the complication of perforation. Of those five, four had previously undergone Nissen fundoplication surgery and in two cases, the patients died. In the said series, the rate of occurrence of perforation in patients with a history of previous gastric surgery was 66.6% [3].

Sudden acute abdominal pain occurring days or even months after intragastric balloon placement is a sign of a possible gastric perforation, a serious complication that can lead to sepsis and death if it is not diagnosed early on [8, 9]. The diagnosis is based on the clinical findings with a special focus on intense epigastric pain, on the physical examination, abdominal tympanism, and abdominal defense, depending on the stage of the complication at which the diagnosis is being made.

In some cases, the intragastric balloon may block the perforated area thereby preventing the formation of a pneumoperitoneum and delaying prompt diagnosis. The definitive etiological diagnosis is obtained by endoscopy, which is routinely performed after removal of the balloon.

The definitive treatment is a surgical intervention to close the perforation and clean the cavity [10]. Whenever possible, videolaparoscopy is the preferred method, minimizing surgical aggression [8]. In some cases of very small perforations, with no evident clinical repercussions, an endoscopic intervention for the placement of clips and sutures may be a viable option.

Final Remarks

- The possibility of a gastric perforation must be considered in cases where a patient with an intragastric balloon implanted experiences sudden, acute abdominal pain.
- Endoscopy provides the definitive diagnosis but can be complemented by X-ray and ultrasound examinations and by computerized tomography.
- Treatment of this complication is urgent and usually via surgical intervention closing the lesion and cleaning the cavity.

References

1. Nieben OG, Harboe H. Intragastric balloon as an artificial bezoar for treatment of obesity. *Lancet*. 1982;1(8265):198–9.
2. Harboe H, Nieben OG. Intragastric balloon in the treatment of obesity. Report of a pilot study. *Ugeskr Laeger*. 1982;144(6):394–6.
3. Genco A, Bruni T, Doldi SB, et al. BioEnterics intragastric balloon: the Italian experience with 2,515 patients. *Obes Surg*. 2005;15(8):1161–4.
4. Schapiro M, Benjamin S, Blackburn G, et al. Obesity and the gastric balloon: a comprehensive workshop. Tarpon Springs, Florida, March 19–21, 1987. *Gastrointest Endosc*. 1987;33(4):323–7.
5. Yorke E, Switzer NJ, Reso A, et al. Intragastric balloon for management of severe obesity: a systematic review. *Obes Surg*. 2016;26(9):2248–54.
6. Koutelidakis I, Dragoumis D, Papaziogas B, et al. Gastric perforation and death after the insertion of an intragastric balloon. *Obes Surg*. 2009;19(3):393–6.
7. Giardiello C, Cristiano S, Cerbone MR, et al. Gastric perforation in an obese patient with an intragastric balloon, following previous fundoplication. *Obes Surg*. 2003;13(4):658–60.

8. Abou Hussein BM, Khammas AA, Al Ani AM, et al. Gastric perforation following intra-gastric balloon insertion: combined endoscopic and laparoscopic approach for management: case series and review of literature. *Obes Surg.* 2016;26(5):1127–32.
9. Al-Zubaidi AM, Alghamdi HU, Alzobydi AH, et al. Bowel perforation due to break and distal passage of the safety ring of an adjustable intra-gastric balloon: a potentially life threatening situation. *World J Gastrointest Endosc.* 2015;7(4):429–32.
10. Sanchez-Perez MA, Munoz-Juarez M, Cordera-Gonzalez de Cosio F, et al. Gastric perforation and subarachnoid hemorrhage secondary to intra-gastric balloon device. *Rev Gastroenterol Mex.* 2011;76(3):264–9.