

# Abdominal ultrasound for the control of patients with intragastric balloon (igb). An effective and safe protocol

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## Abstract:

Intragastric balloon (IGB) treatment, together with multidisciplinary follow-up, has proven to be effective in facilitating weight loss and habit change. It is used in patients with significant obesity (BMI >30), in whom the usual treatments have failed and who still do not have an indication for bariatric surgery. They are also used for preoperative weight loss in patients at risk, for bariatric surgery or any other type. The objective is to evaluate the usefulness of abdominal ultrasound, as an exploration for the control and management of patients with gastric balloon, improving efficacy and safety. This is a prospective study between January 2018 and December 2019, where 78 intragastric balloons were implanted: 54 of them silicone (30 lasting 12 months and 24 lasting 6 months) and 24 ingestible and excretable balloons. All patients have received a monthly clinical, nutritional and psychological control and therapy adjusted to the protocol and to the characteristics of

each patient. Monthly ultrasound has been performed in the same consultation, by the same doctor who controls the process. Abdominal ultrasound has allowed us to assess the correct implantation, and during every month, the optimal filling of the balloon, its permanence in the stomach, and the volume of food residues inside the stomach. In addition to facilitating patient control, this information has given patients peace of mind and adherence to treatment. We have not found any previous publication on this topic.

## Keywords:

- Obesity
- Gastric balloon
- Ingestible balloon
- Abdominal ultrasound
- Multidisciplinary follow-up

## Introduction

EIGB is a good support method for weight loss, which can be used in patients with obesity greater than 30 BMI.

Its most widespread use is to facilitate weight loss when other methods have failed and the patient still has no indication for bariatric surgery.

Also, for weight loss and improvement of comorbidities, in patients who are going to undergo surgery.

The focus of interest may be both the need to reduce the fat mass in the area of the surgical approach, as well as to

improve the control of comorbidities, such as glycemic control, cardio-respiratory function, or the improvement of OSAS

The incorporation of protocol ultrasound in IGB control has arisen mainly for two reasons: 1- Due to the arrival of the ingestible and excretable balloon, due to the possible uncertainty of its expulsion. 2- To control a partial loss of physiological serum in the IGB.

## Objetives

To evaluate abdominal ultrasound for the control and treatment of patients with implanted IGB.

## Methods and Patients

From January 2018 to December 2019, we have implanted a total of 78 BIG: 54 of them silicone (30 lasting 12 months and 24 lasting 6 months) and 24 ingestible and excretable

balloons. The silicone balloons have been implanted and explanted by endoscopy and sedation in an endoscopy room, where an endoscopist, an anesthesiologist and a technical

assistant have participated. The ingestible balloons have been implanted in a simple radiology room, performed by the bariatric surgeon and a radiology technician. Ingestion of the capsule of the ingestible balloon has been carried out with the help of small and repeated sips of water, although in 90% of cases the help of the metal guide in the tube has been necessary to facilitate passage through the pharynx. The ingestible balloon has been spontaneously excreted around week 16 after implantation. In no case has the patient detected it in the stool, and its expulsion has always been confirmed by ultrasound.

All patients have received a monthly clinical, nutritional and psychological control and therapy adjusted to the protocol and to the characteristics of each patient. Monthly ultrasound was performed at the same time as the review, in the same consultation and by the surgeon who controls the process. The ultrasound has evaluated: 1- Filling volume of the IGB (the circumferential shape has been considered as complete filling). 2- Location of the balloon (both inside the stomach, and the place inside it, appreciating a wide fundus with content in the case of descent of the balloon), in the case of the level). 3- Presence of food debris adhered to the balloon (observed as the rim of the IGB with increased and irregular echorefringence). 4- Presence of food residues in the gastric cavity.

## Results

The initial mean BMI of the patients was different according to the type of implanted balloon: BIG silicone 36.4 kg/m<sup>2</sup> and 32.4 kg/m<sup>2</sup> for those of 12 and 6 months, respectively. Ingestible and excretable BIG 29.6 kg/m<sup>2</sup>. The final mean BMI was: BIG silicone 31.8 kg/m<sup>2</sup> (-4.6 BMI points) and 28.6 kg/m<sup>2</sup> (-3.8 BMI points) for those of 12 and 6 months, respectively. Ingestible and excretable BIG 27.4 kg/m<sup>2</sup> (-2.3 BMI points). In all patients and review periods, the ultrasounds clearly showed the IGB perfectly filled. In 16 patients, the balloon displaced towards the mesogastrium was corroborated, as detected by simple abdominal palpation. In 100% of the cases, food residues were found in the stomach, starting from the 8th week. When the patient presented foul-smelling or gassy belches, food residues were clearly more abundant and, in some cases, a greater echorefringence of the outer edge of the IGB was found (figures 1,2). In all cases of ingestible and excretable IGB, the balloon was not found in the stomach at the 4th month ultrasound. In all cases, the patients had already noticed that the balloon was no longer inside the stomach, although they had not found it in the stool.

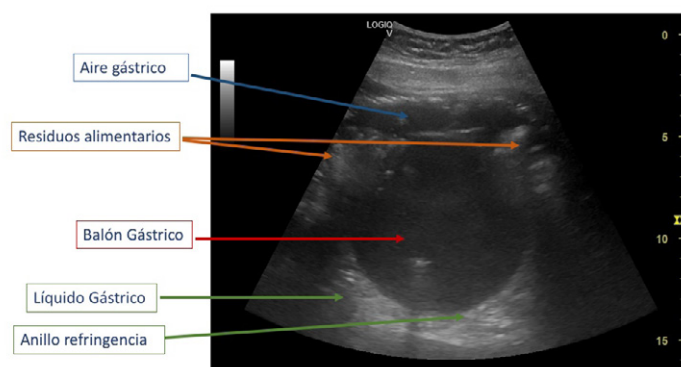


Figure 1: Silicone balloon 30 days after implantation. The surface of the balloon is quite clean, although it has abundant food residues and a slight echo-refringence ring

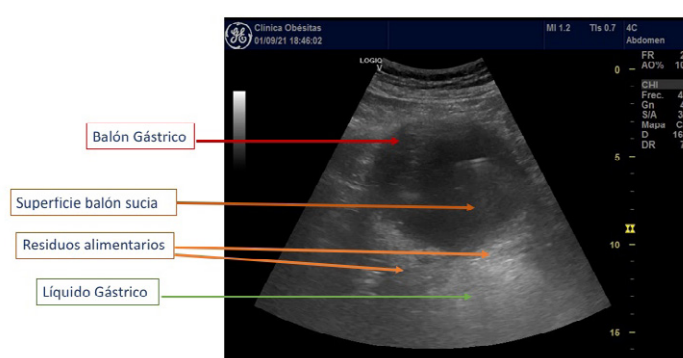


Figure 2: Silicone balloon 4 months after implantation. The surface of the balloon is already more contaminated with food residues (less clean balloon image) in addition to abundant residues in the gastric lumen. No echo-refringence ring is observed

## Discussion

The intragastric balloon has been shown to be effective in combination with dietary and behavioral treatment (1,2). The prior commitment of the patient to change their habits, and adherence to follow-up, are essential to achieve good results in the medium term (3,4). Some of the most notable changes in patients treated with BIG are: improvement in food quality, decrease in quantities, decrease in anxiety, improvement in the management of emotional hunger, implementation of physical activity with weight loss.

Long-term data on IGB safety and short-term efficacy, although studies of the excretable ingestible balloon are scarce (5). In addition, there are very few studies on the outcome beyond 12-24 months. In our team, we follow up patients for up to 2 years, with acceptable results (6). Regarding the safety of the procedure, a good selection of the patient is very important, respecting the contraindications, with special mention to patients with significant binge eating

and bulimic patients. And also, a close control of the patient for as long as the patient has the implanted BIG. In our group we implemented the use of ultrasound for patient control in 2016, and we have been learning and optimizing it, until we have obtained a very useful tool.

Curiously, we have not found any publication on this possible usefulness of ultrasound for the follow-up and support of IGB therapy, and only for evaluation after implantation (7,8). Ultrasounds provide important information about the state of the IGB (completely filled or partially emptied, clean or with food residues attached), and the state of the stomach with respect to the tolerance of the balloon (food residues in the fundus due to retention, or due to severe dyspepsia, location of the balloon within the abdominal cavity). In addition, sharing all this information with the patient "in situ" is especially encouraging for him, in our experience.

## Conclusions

Abdominal ultrasound is very useful for the clinical control of IGB implantation, and especially for the control of the state of the balloon and the stomach with respect to the balloon, throughout the treatment, helping to make therapeutic decisions and guiding the patient.

## Conflicts of interest

None.

## Bibliography

1. Kim SH, Chun HJ, Choi HS, Kim ES, Keum B, Jeon YT. Current status of intragastric balloon for obesity treatment. *World J Gastroenterol*. 2016; 28;22(24):5495-504.
2. Jiménez Bazzano MC. Eficacia del empleo del balón intragástrico en el control temporal de la obesidad en Paraguay. *Mem. Inst. Investig. Cienc. Salud* 2012; 10 (1): 36-45.
3. Mazure RA, Cancer E, Martínez Olmos MA, De Castro ML, Abilés V, Abilés J, Bretón I, Álvarez V, Peláez N, Culebras JM; Grupo de Trabajo OBESMINVA de la SENPE. Adherencia y fidelidad en el paciente tratado con balón intragástrico. *Nutr Hosp*. 2014; 1;29 (1):50-6.
4. González Mariela, Lugli Zoraide. Control Personal de la Conducta y Adhesión Terapéutica en Balón Intragástrico Bioenterics. *Gen* 2012; 66 (4): 250-259.
5. Espinet-Coll Eduardo, Nebreda-Durán Javier, López-Nava-Breviere Gontrand. Nuevo balón intragástrico ingerible (Eclipse®). ¿Café para todos? Posicionamiento de GETTEMO. *Rev. Esp. Enferm. Dig.* 2018; 110 (1): 65-65.

6. Angel Sanahuja, Jose Vicente Ferrer, Lydia Amador, Yolanda Melero Javier Sempere. Eficacia del balón intragástrico en obesidad moderada: tasa de fracasos y evolución a los 24 meses. *Clínica Obesitas - Hospital 9 de Octubre, Valencia. BMI-Journal*. 2011; 1.2.4
7. Lari E, Burhamah W, Lari A, Alsaeed T, Al-Yaqout K, Al-Sabah S. Intra-gastric balloons - The past, present and future. *Ann Med Surg*. 2021; 2; 63: 102138.
8. Ali M Al-Zubaidi, Hassan U Alghamdi, Abdu H Alzobydi, Irshad A Dhiloon, Laeeque A Qureshi. 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.