Case report

Left renal vein compression complicating intragastric balloon insertion✩

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Abstract

Obesity is a real public health problem and is of growing concern. People are resorting to surgical or endoscopic means to fight against overweight and obesity. In recent years, there has been a marked increase in the use of these means and in particular the insertion of a gastric balloon which seems to present less risk than surgical methods. Renal complications from intragastric balloon placement are extremely rare. We report here the case of compression of the left renal vein revealed by lumbar pain and hematuria in an overweight 39-year-old woman who benefited from the balloon gastric placement one month before symptoms. The scanner made the diagnosis and showed a good evolution after the withdrawal of the balloon.

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Introduction

Obesity is a real public health problem, on a constant rise. Hygiene-dietetic measures and medical treatment are helpful and are the first choice of treatment for patients with severe or morbid obesity. Bariatric surgery is usually the most efficient treatment for patients with massive and complicated obesity. However, some severe obesities do not respond to medical therapy, for this category endoscopic procedure seems to be an attractive alternative; safer and less invasive than bariatric surgery, endowed with multiples advantages such as; the possibility of being repeated, it is associated with fewer complications, and can be performed on an outpatient basis. Intragastric balloon is the most used endoscopic technique, typically implanted for 6 months, then retrieved endoscopically and could be responsible for weight loss of 8%-15%. Side effects are usually vomiting, abdominal pain and intestinal occlusion [1–3]. Only few studies reported renal complications [4,5].

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Imaging such as CT scan and MRI, play a key role in the diagnosis of severe complications of IGB. We report the case of an intragastric balloon compressing the left renal vein in 39-<br>Years old woman two months following insertion of an intra-<br>gastric balloon (IGB).

**Case report**

A 39-year-old woman admitted to the emergency room for left-flank pain evolving for 10 days associated with macro-<br>scopic hematuria. She had a history of obesity and have had an intragastric balloon introduced endoscopically (a He-<br>liosphere Newtech IGB filled with air), 2 months ago, she<br>had no immediate post-procedure complications except for a<br>few episodes of nausea and vomiting. The clinical examination<br>found only an abdominal distension without any other anomaly.<br>The blood test was normal including blood count and renal function. Dip a urine and urinalysis revealed red urine, with el-<br>eved blood cells and normal range of white cells. At the time of<br>the examination, she had a body weight of 87 kg (BMI 31.5<br>kg/m²), representing an 8% loss of her pre-IGB body weight. A<br>non-contrast computed tomography (CT) of the abdomen (stone protocol) was performed to eliminate kidney stones, but<br>instead it showed an IGB filled with air compressing the left renal vein (Fig. 1 and 2). Abdominal CT with intravenous contrast provided the confirmation by showing a dilated left renal vein measuring 15.9 mm (Fig. 3). Otherwise, the other intra-abdominal organs were normal. The IGB was quickly re-<br>moved under endoscopy. The gastric lining was intact with no<br>evidence of ulcers, perforation, bleeding or trauma (Fig. 4). The<br>balloon was deflated and removed successfully. The patient<br>was kept under observation 48 hours. Urine culture was neg-<br>ative.

1 month after balloon removal an abdominal CT scan with<br>contrast was performed and showed permeable renal vessels<br>of normal caliber (Fig. 5).

**Discussion**

Obesity is clearly a growing worldwide problem. According to<br>the World Health Organization “in 2016 more than 1.9 billion

adults, 18 years and older, were overweight. Of these over 650<br>million were obese” [6].

There are different management options available to these<br>patients, ranging from lifestyle, dietary changes, gastric band-<br>ing, bariatric surgery and IGB. Endoscopic insertion of IGB was<br>firstly described in the beginning of the 1980s; The first re-<br>results had been published in 1982 [7]. It has been used as it<br>provides a less invasive and potentially safer option for short-<br>term weight loss.

Insertion of IGB is a procedure that consists on the inser-<br>tion of an elastic intragastric balloon to increase the sense of<br>satiety, reduce oral intake and induce weight loss. It’s a non-<br>invasive, reversible procedure. The introduction on the bal-<br>loon is done under endoscopic control, it’s indicated in the<br>treatment of morbid obesity in addition to dietary measures<br>or as a first step in superobese patients before subsequent<br>bariatric surgery [8,9].

The BIG is usually removed 6 months after placement, re-<br>gardless of effectiveness and weight result.

The most common symptoms after a BIG insertion are<br>harmless and non-specific such as vomiting, nausea, cramps, and mild abdominal pain in 10%-90% of cases, depending on<br>the series, usually during the first week [10,11]. More serious<br>complications such as peptic ulceration, pancreatitis, gastric<br>dilations, gastric perforation and esophageal perforation are<br>described more rarely [12–14].

Other serious complications have been reported: a case of<br>cardiac arrest complicated by a vegetative state a few hours<br>after the insertion of the BIG has been reported by Cubattoli<br>et al. [15]. Totté et al. [16] reported two gastric perforations as<br>a complication of insertion of IGB for weight reduction in a<br>series of 126 patients.

Multiples cases of BIG migration following its rupture have<br>been described [10,17,18] causing occlusions of the small in-
Fig. 3 – Contrastened abdominal CT scan showing a dilated left renal vein measuring 15.9 mm (star) ahead its compression by the intragastric balloon (arrow)

Fig. 4 – Endoscopic view of intragastric balloon before the removal

Fig. 5 – Contrastened abdominal CT scan 1 mo after balloon removal showing a permeable left renal vein of normal caliber

testine or of the colon [18], and required endoscopic and surgical extraction.

Other serious and rare complications have been reported like pancreatitis and renal injury [4,5,12]. We report an unusual case of renal complication of IGB ruled out by CT scan

Emad S. Aljahdli et al. [4] Described a case of ischemic renal injury as a complication of intragastric balloon insertion, that occurred 40 days after insertion of an Orbera IGB filled with 600 ml normal saline mixed with methylene blue.

In our case, the IGB was a Heliosphere filled with air and the left renal compression didn’t lead to renal ischemia.

Milone et al. [5] reported an acute renal failure and metabolic acidosis 5 days after IGB insertion due to vomiting and dehydration. Other cases of acute renal failure were reported, including two diabetic patients that developed it within two weeks after IGB insertion. In these cases, it was attributed to vomiting, dehydration, and metformin administration.

Imaging plays a key role in the diagnosis of serious complications such as pancreatitis, occlusions of the small intestine, ischemic renal injury, duodenal migration of the balloon [19,20].

CT scanning is a technique of choice for the diagnosis of small-bowel obstruction, gastric perforation, renal vein compression,

Ultrasound is useful in the control of the left renal vein after the removal of the IGB [21]

Conclusion

BIG is an endoscopic technique for treating obesity as an alternative to or in preparation for bariatric surgery.

This technique exposes multiple complications, as illustrated by this case of compression of the left renal vein diagnosed by a CT scan.

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