



Acute pancreatitis caused by gastric balloon: a case report

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Background: Intra-gastric balloon (IGB) insertion is a safe and effective method for the treatment of obesity. The most common side effects of the balloon-therapy are nausea/vomiting and abdominal pain, acute pancreatitis has rarely been reported.

Case Description: We present the case of a 28-year-old woman who underwent IGB insertion 9 months before onset of intense upper abdominal pain. We confirmed the diagnosis of acute pancreatitis by means of clinical symptoms, serological tests and cross-sectional imaging. Endoscopic removal of the balloon led to a complete resolution of the symptoms. Initial laboratory parameters were normal on admission, only the control of lipase and amylase levels led us to the diagnosis of pancreatitis. On imaging with computed tomography, the filling catheter of the balloon showed to be dislodged in the duodenum. After carrying out a systematic approach, other causes of pancreatitis were ruled out.

Conclusions: Laboratory tests including amylase/lipase and adequate imaging should be considered in patients with relevant symptoms after gastric balloon insertion. A possible pathogenesis may be the direct compression and traumatic effect on the pancreas by the balloon or the dislodgement of the catheter into the duodenum and an obstruction/compression of the Papilla. Endoscopic removal of the balloon is not mandatory in every case, it should be decided individually.

Keywords: Acute pancreatitis; intra-gastric balloon (IGB); balloon pancreatitis; case report

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Introduction

Obesity is increasing worldwide causing relevant mortalities and morbidities. Intra-gastric balloon (IGB) insertion is a safe and effective method commonly used as a bridging therapy prior bariatric surgery, but also as a primary weight loss strategy in case of failed dietary changes, lifestyle modification and medical therapy. Implanting a balloon device in the stomach helps with weight loss by generating a sense of fullness and reducing the volume available for food (1). A weight reduction of approximately 15–20% of total body weight can be reached (2).

The method is considered to have a low morbidity and mortality; however diverse complications may occur. Mild side effects such as nausea, abdominal pain and gastroesophageal reflux are not uncommon after insertion, but also some life-threatening complications including ulceration, perforation and bowel obstruction have been reported (3). Pancreatitis due to IGB insertion is a rare complication, 39 cases have been published so far. We present this article in accordance with the CARE reporting checklist (available at <https://acr.amegroups.com/article/view/10.21037/acr-23-171/rc>).

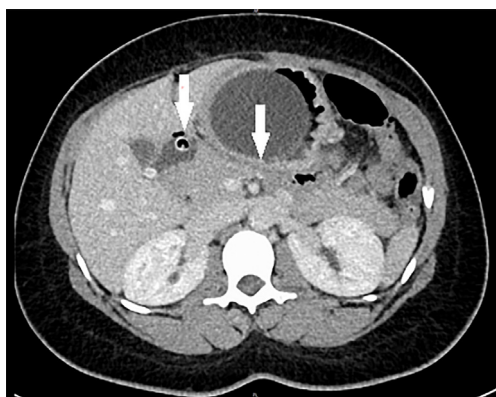


Figure 1 Computed tomography of the sagittal plane. The arrows refer to the dislodged filling catheter in the duodenum and the slightly compressed corpus of the pancreas by the balloon.

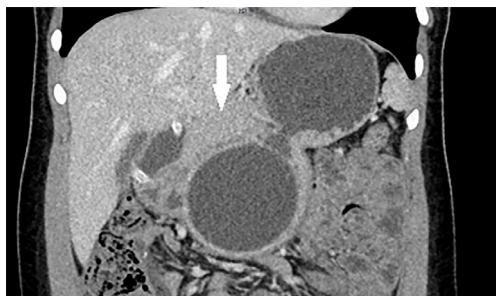


Figure 2 Computed tomography of the coronal plane. The arrow indicates the slightly compressed neck of the pancreas by the balloon.

Highlight box

Key findings

- In this report, we report a case of gastric balloon pancreatitis, which is a rare complication after intragastric balloon (IGB) insertion.

What is known and what is new?

- The diagnosis is based on laboratory and imaging tests, and on exclusion of other causes of pancreatitis. There have only been 39 cases with gastric balloon pancreatitis published so far, however, the prevalence may be higher.
- Many cases may probably remain undetected due to lack of specific symptoms.

What is the implication, and what should change now?

- Lipase/amylase levels should be measured and adequate imaging should be performed in patients with IGB and relevant abdominal pain as not to misinterpret the symptoms as gastric distension or oesophagitis.

Case presentation

A 28-year-old female patient with a body mass index (BMI) of 28.3 kg/m^2 presented to our emergency department with a sudden onset of upper abdominal pain with a duration of 2 hours. The balloon (Spatz3 Adjustable Balloon System; Spatz FGIA, Great Neck, NY, USA) was inserted and filled with 500 mL saline 9 months earlier in another country. Her BMI was 35.5 kg/m^2 before the balloon treatment, she has reached a total body weight reduction of 20 kg. On a 4-month follow-up, the balloon was well tolerated and the patient didn't experience any weight loss plateau, so there was no endoscopic balloon adjustment performed. Her medical history was otherwise unremarkable, alcohol consumption was denied, and she was on no medications. On physical examination, the patient was afebrile and hemodynamically stable. The abdominal palpation revealed severe tenderness at the epigastric and left hypochondric regions. Initial laboratory workup showed no abnormalities. 12 hours later, however, a leukocytosis ($12.3 \times 10^9/\text{L}$), slightly elevated C-reactive protein level (22 mg/dL) and lactate dehydrogenase (LDH) (290 U/L) could be detected, and both lipase (423 U/L) and amylase (204 U/L) levels were over $3 \times$ above the normal range. Triglyceride, cholesterol, immunoglobulin G4 (IgG4) and calcium levels were normal.

An abdominal ultrasound on admission was negative for cholelithiasis, sludge in the gall bladder, as well as for common bile duct (CBD) or intrahepatic bile duct dilatation. In regard to the severe abdominal pain and tenderness, an urgent intravenous contrast enhanced abdominal computed tomography (CT) was performed to exclude gastric perforation or bowel obstruction. The balloon could be seen slightly compressing the body of the pancreas without any pancreatic duct dilatation, the catheter of the balloon showed to be dislodged into the duodenum. There was no inhomogeneity of the pancreatic parenchyma or pancreatic fluid collection visible. No CBD or intrahepatic bile duct dilation could be detected, supporting the ultrasound findings. Other major complications such as perforation or relevant gastric ulceration could also be excluded (*Figures 1-3*).

Intravenous fluid replacement was carried out as recommended in current guidelines. For analgesia were $2 \times 20 \text{ mg}$ morphine hydrochloride and $3 \times 1 \text{ g}$ metamizole administered intravenously in the first 24 hours. Although the symptoms improved significantly for the second day, we decided for the endoscopic removal of the balloon.



Figure 3 Computed tomography of the coronal plane. The arrow refers to the dislodged filling catheter in the duodenum.

Thereafter, the patient showed further fast clinical recovery with the normalization of laboratory parameters in 4 days after admission. We repeated the abdominal ultrasound scan on the third day, which showed no abnormality of the pancreas or the peripancreatic region, so that we could assess a mild form of pancreatitis according to the revised Atlanta criteria. During a follow-up of 12 months no other episode of pancreatitis occurred, routine laboratory tests and ultrasound 6 weeks after discharge were also without any pathologic findings.

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

Discussion

IGB therapy has been used since 1985 as an effective minimally invasive technique in the treatment of obesity. Acute pancreatitis is a rare complication of the method. The first case was reported in 2008 by Mohammed *et al.* (4), followed by 20 other publications (5-24) (Table 1), mainly with 1 or 2 cases and some case series with 4–10 patients. In last few years, there have been significantly more balloon pancreatitis cases published than before. There may be a higher prevalence, many cases may probably remain undetected due to lack of specific symptoms and without performing laboratory and imaging tests. Upper abdominal pain in patients with IGB is a nonspecific symptom,

mainly caused by gastroesophageal reflux or gastric outlet obstruction. In the case of our patient, the first laboratory test was performed 2 hours after the onset of the abdominal pain, showing no abnormalities. Repeated blood analysis 12 hours later led us to the diagnosis of pancreatitis. Cross-sectional imaging with contrast enhancement is crucial to assess the severity of the pancreatitis and to exclude other complications such as balloon migration or perforation. In most of the published cases, the pancreatitis appeared in a mild edematous form. In some patients, the balloon could be left on site and it came to a quick clinical and biochemical recovery under a conservative treatment. In the case of our patient, we could also observe a fast relief of the abdominal pain, but regard to the ongoing balloon treatment period of 9 months, and in order to prevent a next episode of pancreatitis, we decided the removal of the device.

We suppose an association between the balloon insertion and the acute pancreatitis. A possible pathogenesis for the inflammation may be a direct compression and traumatic effect on the pancreas by the balloon. However, in some other publications (9,13,21) was the dislodgement of the catheter into the duodenum—like in the case of our patient—also mentioned as a possible causal factor due to an obstruction/compression of the Papilla.

This report has some limitations to determine the strength of association between gastric balloon insertion and pancreatitis. Endoscopic ultrasound (EUS) was not performed to exclude microlithiasis of the CBD, however, at absence of gallbladder stones/sludge, normal CBD diameter and normal cholestatic parameters, a biliary cause is rather unlikely. Magnetic resonance cholangiopancreatography (MRCP) was not performed for pancreas divisum, and we didn't use genetic testing to exclude an autoimmune etiology.

Conclusions

Acute pancreatitis associated with IGB insertion is a rare complication, the incidence is probably underreported. We suggest measuring lipase/amylase levels besides routine laboratory tests and performing adequate imaging in patients with IGB and relevant abdominal pain as not to misinterpret the symptoms as gastric distension or oesophagitis. Further research and analysis of more reported cases is needed to identify potential risk factors (balloon type, size, shape, volume) to possibly prevent this complication.

Table 1 Published case reports and case series on gastric balloon pancreatitis

1st author	Title of publication	Year of publication	Number of cases
Mohammed AE (4)	Acute pancreatitis complicating intragastric balloon insertion	2008	1
Shelton E (5)	Education and Imaging. Gastrointestinal: balloon pancreatitis	2012	1
Vongsuvan R (6)	Acute necrotizing pancreatitis, gastric ischemia, and portal venous gas complicating intragastric balloon placement	2012	1
Geffrier C (7)	Acute “balloon pancreatitis”	2014	1
Navajas-Laboa M (8)	Intragastric balloon and epigastric pain: beware of the pancreas	2015	1
Öztürk A (9)	A case of duodenal obstruction and pancreatitis due to intragastric balloon	2015	1
Selfa Muñoz A (10)	Acute pancreatitis associated with the intragastric balloon	2016	1
Issa I (11)	Acute pancreatitis caused by intragastric balloon: A case report	2016	1
Said F (12)	Pancreatitis and intragastric balloon insertion	2016	1
Aljiffry M (13)	Acute pancreatitis: a complication of intragastric balloon	2017	4
Gore N (14)	Pancreatitis from intra-gastric balloon insertion: Case report and literature review	2018	1
Alsohaibani FI (15)	Acute Pancreatitis as a Complication of Intragastric Balloons: a Case Series	2019	10
Barrichello S (16)	Acute pancreatitis due to intragastric balloon hyperinflation	2020	1
Halpern B (17)	Extrinsic compression of pancreatic duct by intragastric balloon treatment and its potential to cause acute pancreatitis: two case reports and clinical discussion	2020	2
Alqabandi O (18)	Intragastric balloon insertion and pancreatitis: Case series	2020	5
Abdulghaffar S (19)	Acute pancreatitis as a late complication of intra-gastric balloon insertion	2021	1
Schwingel J (20)	Acute Pancreatitis Following Insertion of a Gastric Balloon-an Unusual Cause	2021	1
Al Ghadeer HA (21)	Acute pancreatitis as a complication of intragastric balloon	2021	2
Chirinos Vega JA (22)	Intra-gastric balloon associated with acute pancreatitis	2022	1
Akiki L (23)	Acute Pancreatitis as a Complication of an Intragastric Balloon	2023	1
Al Refai F (24)	Acute Pancreatitis Secondary to Intragastric Balloon: A Case Report and Literature Review	2023	1

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Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at <https://acr.amegroups.com/article/view/10.21037/acr-23-171/rc>

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Conflicts of Interest: All authors have completed the ICMJE

uniform disclosure form (available at <https://acr.amegroups.com/article/view/10.21037/acr-23-171/coif>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for the publication of this case report and

accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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