Journal of Clinical and Investigative Surgery

https://doi.org/10.25083/2559-5555
https://proscholar.org/jcis/
ISSN: 2559-5555

A rare cause of abdominal pain: Acute pancreatitis due to intragastric balloon

Tolga Kalayci[1*], Serkan Tayar[2]

[1]*Ağrı İbrahim Çeçen University Faculty of Medicine Department of General Surgery, Ağrı, Turkey*
[2]*Department of General Surgery, Medical Park Trabzon Karadeniz Hospital, Trabzon, Turkey*

ABSTRACT

The intragastric balloon is one of the interventional treatments used to treat obesity. This case report presents a 28-year-old woman undergoing intragastric balloon insertion to treat obesity. Thirty-five days later, she was admitted to the emergency department with acute abdominal pain, nausea, and vomiting. During the physical examination, she had pain on deep palpation in the right lower quadrant. The laboratory showed only high serum amylase levels of 563 IU/L (range 28-100 IU/L). The abdominal ultrasound did not detect gallstones or enlarged intra or extrahepatic ducts. A computed tomography scan was performed, and intragastric balloon and distal pancreatic oedema without mass and peri-pancreatic fluid collection were detected. Intravenous hydration and anti-biotherapy were started. On the second day of hospitalization, the patient's amylase value returned to the normal range (40 IU/L). The patient who tolerated oral intake was discharged on the 3rd day of hospitalization. Diagnosis of pancreatitis is made by a history of intragastric balloon insertion, a pancreatitis-like clinical picture, and biochemical and radiological confirmation of the clinical diagnosis. In such cases, conservative therapy should be applied first; the intragastric balloon should be removed only in patients resistant to treatment or with a long-term intragastric balloon.

Category: Case Presentation

Received: June 06, 2022
Accepted: August 14, 2022
Published: November 20, 2022

Keywords:

acute pancreatitis, amylase, gastric balloon, abdominal pain

***Corresponding author:**

Tolga Kalayci,

Ağrı İbrahim Çeçen University Faculty of Medicine Department of General Surgery, Ağrı, Turkey

E-mail: dr.tolgakalayci@gmail.com

Introduction

Obesity is a condition that must be treated because of the various health problems it can cause [1]. The treatment aims to reduce the morbidity and mortality risks by targeting a realistic body weight loss, to make the individual gain adequate and balanced nutrition habits and regular physical activity habits, and to increase the quality of life [2]. Nutrition therapy, exercise and behavior modification therapy are the first steps of the obese individual's treatment program [3,4]. Pharmacological and interventional treatments should be tried in cases that do not benefit first-line treatment [5,6].

Intragastric balloon (IGB) is one of the interventional treatments used to treat obesity and has become popular over time. Although gastric balloon application is minimally invasive and weight loss results are promising, life-threatening complications such as perforation, necrosis, and pancreatitis can occur [7]. Pancreatitis is an infrequent complication of IGB insertion. In the study of Vergas et al., the rate of pancreatitis was 2.1%. In addition, the FDA has received approximately 30 reports of acute pancreatitis adverse events worldwide since 2015 [8]. As obesity increases worldwide, IGB applications will also increase, so the number of pancreatitis cases can be considered inevitable. Therefore, knowing the diagnosis and treatment of pancreatitis will be necessary for every surgeon.

This current case report presents the diagnosis and treatment approach of the pancreatitis attack caused by IGB compression on the pancreatic duct.

Case Presentation

A 28-year-old woman with a body mass index (BMI) of 28.60 kg/m2 (weight: 76 kg; height: 1.63 meters) underwent intragastric balloon insertion to treat obesity on February 25, 2022. The patient had no concomitant disease or history of surgery. The IGB was inserted into the stomach and filled with 500 mL methylene blue. Thirty-five days later, she was admitted to the emergency department of an external center with acute abdominal pain, nausea and vomiting. The abdominal pain was cramping, constantly radiating to the back, and relieved by leaning forward.

To cite this article: Kalayci T, Tayar S. A rare cause of abdominal pain: Acute pancreatitis due to intragastric balloon. *J Clin Investig Surg*. 2022;7(2):210-213. doi: 10.25083/2559.5555/7.2.16

On evaluation, her vital findings were as follows: blood pressure: 127/65 mm Hg, pulse rate: 104 beats per minute, oxygen saturation on room air: 94-96%, and body temperature: 37.1º Celsius. On abdominal physical exam, she had abdominal pain in deep palpation in the right lower quadrant. Other systemic examinations, including rectal exam, were performed routinely. The laboratory showed only high serum amylase levels of 563 IU/L (range 28-100 IU/L). The abdominal ultrasound did not detect gallstones or enlarged intra or extrahepatic ducts. A computed tomography scan was performed, and intragastric balloon and distal pancreatic oedema without mass and peri-pancreatic fluid collection were detected on tomography (Figures 1 and 2).

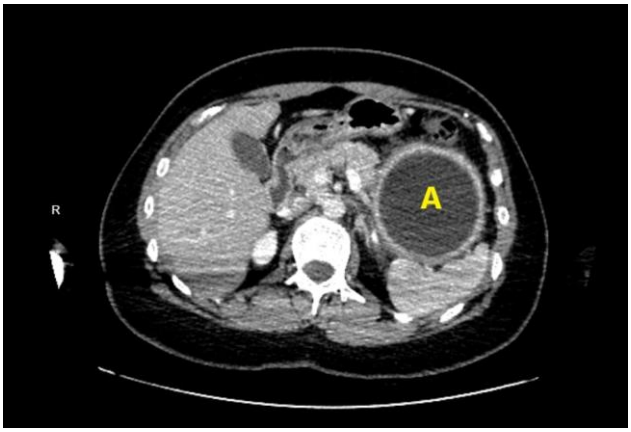

Figure 1. On the CT scan, the intragastric balloon is marked with "A".

Figure 2. Peri-pancreatic fluid collections is shown with arrows on the CT scan.

She was hospitalized for follow-up, and her oral intake was stopped. Intravenous hydration and ceftriaxone 1 g vial every 12 hours were started. Paracetamol 10 mg/mL was given when she had pain. On the second day of her hospitalization, the patient's amylase value returned to the normal range (40 IU/L). The patient who tolerated oral intake was discharged on the 3rd day of hospitalization.

Discussion

Intragastric balloon (IGB) has gained importance in recent years as a reliable and minimally invasive method for weight loss. IGB aims to increase satiety and decrease food intake by increasing mechanical gastric bloating [9,10]. IGB is based on placing a balloon in the stomach under endoscopy and filling this balloon with 400-700 mL of liquid. The average duration of IGB is six months. Common side effects after IGB insertion are nausea, vomiting, abdominal pain and gastroesophageal reflux. In addition, serious complications such as ulceration, perforation and balloon migration may occur. Rarely, acute pancreatitis may occur as a severe complication of IGB [11,12].

A triad has been developed for the diagnosis of pancreatitis after IGB. The diagnostic criteria were as follows: 1) IGB insertion history; 2) Clinical presentation of pancreatitis including epigastric pain, nausea, vomiting, and fever; 3) Confirmation of diagnosis by biochemical and radiological tests [13]. Elevated serum amylase and lipase levels are the primary biochemical markers in the diagnosis, and these values may be accompanied by leukocytosis and high C-reactive protein [14,15]. Ultrasonography (USG) and computed tomography (CT) evaluate the IGB, hepatopancreatic biliary system, and additional intra-abdominal pathologies. However, a CT scan provides more sensitive, specific and detailed information than USG. While ultrasonography is used to rule out the presence of biliary pancreatitis, a CT scan can show the company of cholelithiasis, pancreatic compression, duodenal compression, peripancreatic fluid collections, and pancreatic oedema [16,17]. In the present case, the patient was admitted to the emergency department with a clinical presentation suggestive of acute pancreatitis. In addition, the patient's amylase levels were higher than normal. CT scan showed distal pancreatic oedema without mass and peri-pancreatic fluid collection due to compression of IGB.

The mechanism of acute pancreatitis may be due to direct injury of the balloon to the pancreas, compression of the pancreatic parenchyma or pancreatic duct, or backward pressure through duodenal obstruction [16-18]. However, the main reason is the compression of the pancreatic duct in most previously presented cases like our case report.

Treatment of acute pancreatitis due to IGB should be patient-based. Today, there is no consensus on the treatment to be applied according to the time of pancreatitis attack. The time elapsed between IGB insertion and pancreatitis attack ranged from 1 day to 3 years in this review [19-21]. While conservative treatment was sufficient in one-third of all patients, balloon removal was required in the remaining patients. Conventional treatment includes stopping the patient's oral intake, providing appropriate antibiotic therapy, and providing appropriate analgesia. IGB removal is possible primarily with endoscopy, but laparotomy is the right option in IGB cases that cannot be removed by endoscopy [22,23]. A

pancreatitis attack occurred on the 35th day of IGB insertion, and conservative treatment was sufficient for treating pancreatitis.

Conclusions

Pancreatitis due to IGB is a rare condition, and its prevalence increases as the use of balloons increases. Diagnosis is made by a history of IGB insertion, a pancreatitis-like clinical picture, and biochemical and radiological confirmation of the clinical diagnosis. In the treatment, conservative treatment should be tried first, and the IGB should be removed in patients resistant to treatment or with a long IGB insertion time.

Conflict of interest disclosure

There are no known conflicts of interest in the publication of this article. The manuscript was read and approved by all authors.

Compliance with ethical standards

Any aspect of the work covered in this manuscript has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

References

1. Güler Y, Cabar HD, Altay B, Gönener A. Obesity and Nursing Care in Adolescents. *Fırat Journal of Health Services*. 2009;4(10):165-81. https://avesis.kocaeli.edu.tr/yayin/d2a61b3a-e52b-465b-b566-b89e894f717a/adolesanlarda-obezite-ve-hemsirelik-bakimi
2. Kumsar AC, Yılmaz TF, Olgun N. Current approaches in obesity. *Nursing Forum in Diabetes, Obesity and Hypertension*. 2011;3(1):21-9. https://avesis.cumhuriyet.edu.tr/yayin/61a2ab98-7e87-4533-80f4-a97f22f69e8d/obezitede-guncel-yaklasimlar
3. Kim SY, Shin IS, Park YJ. Comparative effectiveness of a low-calorie diet combined with acupuncture, cognitive behavioral therapy, meal replacements, or exercise for obesity over different intervention periods: A systematic review and network meta-analysis. *Front Endocrinol (Lausanne)*. 2022 Aug 26;13:772478. doi: 10.3389/fendo.2022.772478
4. Putter KC, Jackson B, Thornton AL, Willis CE, Goh KMB, Beauchamp MR, Benjanuvatra N, Dimmock JA, Budden T. Perceptions of a family-based lifestyle intervention for children with overweight and obesity: a qualitative study on sustainability, self-regulation, and program optimization. *BMC Public Health*. 2022 Aug 11;22(1):1534. doi: 10.1186/s12889-022-13956-6
5. Grunvald E, Shah R, Hernaez R, Chandar AK, Pickett-Blakely O, Teigen LM, Harindhanavudhi T, Sultan S, Singh S, Davitkov P; AGA Clinical Guidelines Committee. AGA Clinical Practice Guideline on Pharmacological Interventions for Adults With Obesity. *Gastroenterology*. 2022 Nov;163(5):1198-1225. doi: 10.1053/j.gastro.2022.08.045
6. Calcaterra V, Rossi V, Mari A, Casini F, Bergamaschi F, Zuccotti GV, Fabiano V. Medical treatment of weight loss in children and adolescents with obesity. *Pharmacol Res*. 2022;185:106471. doi: 10.1016/j.phrs.2022.106471
7. Sullivan S, Swain J, Woodman G, Edmundowicz S, Hassanein T, Shayani V, Fang JC, Noar M, Eid G, English WJ, Tariq N, Larsen M, Jonnalagadda SS, Riff DS, Ponce J, Early D, Volckmann E, Ibele AR, Spann MD, Krishnan K, Bucobo JC, Pryor A. Randomized sham-controlled trial of the 6-month swallowable gas-filled intragastric balloon system for weight loss. *Surg Obes Relat Dis*. 2018 Dec;14(12):1876-1889. doi: 10.1016/j.soard.2018.09.486
8. Vargas EJ, Pesta CM, Bali A, Ibegbu E, Bazerbachi F, Moore RL, Kumbhari V, Sharaiha RZ, Curry TW, DosSantos G, Schmitz R, Agnihotri A, Novikov AA, Pitt T, Dunlap MK, Herr A, Aronne L, Ledonne E, Kadouh HC, Cheskin LJ, Mundi MS, Acosta A, Gostout CJ, Abu Dayyeh BK. Single Fluid-Filled Intragastric Balloon Safe and Effective for Inducing Weight Loss in a Real-World Population. *Clin Gastroenterol Hepatol*. 2018 Jul;16(7):1073-1080.e1. doi: 10.1016/j.cgh.2018.01.046
9. Yorke E, Switzer NJ, Reso A, Shi X, de Gara C, Birch D, Gill R, Karmali S. Intragastric Balloon for Management of Severe Obesity: a Systematic Review. *Obes Surg*. 2016 Sep;26(9):2248-2254. doi: 10.1007/s11695-016-2307-9
10. Charalampakis V, Rajeev Y, Singhal R. Adjustable intragastric balloon for obesity. *Lancet*. 2022 Jun 4; 399(10341):2099. doi: 10.1016/S0140-6736(22)00463-9
11. Tsaousi G, Grosomanidis V, Kotzampassi K. Intragastric Balloon for Management of Severe Obesity: Letter to the Editor. *Obes Surg*. 2017 Feb; 27(2):476-477. doi: 10.1007/s11695-016-2458-8
12. Ekremoğlu M, Severcan Ç, Pasaoğlu ÖT, Şen B, Pasaoğlu H. An investigation of acute effects at various doses of malathion on glucose homeostasis and insulin resistance in rat liver, pancreas and serum. *J Mind Med Sci*. 2020;7(1):85-93. doi: 10.22543/7674.71.P8593
13. Aljiffry M, Habib R, Kotbi E, Ageel A, et al. Acute Pancreatitis: A Complication of Intragastric Balloon. *Surg Laparosc Endosc Percutan Tech*. 2017;27(6):456-459. doi: 10.1097/SLE.0000000000000477
14. Navajas-Laboa M, Bridet L, Orive-Calzada A, Cabriada-Nuno JL. Intragastric balloon and epigastric pain: beware of the pancreas. *Turk J Gastroenterol*. 2015 Jan;26(1):87-8. doi: 10.5152/tjg.2015.4227
15. Liengswangwong W, Preechakul P, Yuksen C, Jenpanitpong C, Tienpratarn W, Watcharakitpaisan S. Clinical Prediction Score for Early Diagnosis of Acute

Pancreatitis in Emergency Departments. *Open Access Emerg Med*. 2022 Jul 26;14:355-366. doi: 10.2147/OAEM.S371237

16. Alqabandi O, Almutawa Y, AlTarrah D, Alhajeri M, Jamal MH, Almazeedi S. Intragastric balloon insertion and pancreatitis: Case series. *Int J Surg Case Rep*. 2020;74:263-267. doi: 10.1016/j.ijscr.2020.08.043
17. Răcătăianu N, Leach NV, Bolboacă SD, Soran ML, Flonta M, Valea A, Lazăr AL, Ghervan C. The crosstalk between insulin resistance, systemic inflammation, redox imbalance and the thyroid in subjects with obesity. *J Mind Med Sci*. 2021;8(1):139-148. doi: 10.22543/7674.81.P139148
18. Barrichello S, de Moura DTH, Hoff AC, et al. Acute pancreatitis due to intragastric balloon hyperinflation (with video). *Gastrointest Endosc*. 2020 May;91(5): 1207-1209. doi: 10.1016/j.gie.2019.12.012
19. Halpern B, Paulin Sorbello M, Telles Libanori H, Correa Mancini M. Extrinsic compression of pancreactic duct by intragastric balloon treatment and its potential to cause acute pancreatitis: two case reports and clinical discussion. *Obes Res Clin Pract.* 2020 Mar-Apr;14(2):191-193. doi: 10.1016/j.orcp.2020.02.002
20. Schwingel J, Hüttinger S, Lutz M. Acute Pancreatitis Following Insertion of a Gastric Balloon-an Unusual Cause. *Dtsch Arztebl Int*. 2021 Dec 10;118(49):846. doi: 10.3238/arztebl.m2021.0086
21. Selfa Muñoz A, Calzado Baeza SF, Palomeque Jiménez A, Casado Caballero FJ. Pancreatitis aguda asociada a balón intragástrico [Acute pancreatitis associated with the intragastric balloon]. *Gastroenterol Hepatol*. 2016 Nov;39(9):603-604. Spanish. doi: 10.1016/j.gastrohep.2015.08.006
22. Vongsuvanh R, Pleass H, van der Poorten D. Acute necrotizing pancreatitis, gastric ischemia, and portal venous gas complicating intragastric balloon placement. *Endoscopy*. 2012;44 Suppl 2 UCTN:E383-4. doi: 10.1055/s-0032-1310146
23. Abu Dayyeh BK, Maselli DB, Rapaka B, Lavin T, Noar M, Hussan H, Chapman CG, Popov V, Jirapinyo P, Acosta A, Vargas EJ, Storm AC, Bazerbachi F, Ryou M, French M, Noria S, Molina D, Thompson CC. Adjustable intragastric balloon for treatment of obesity: a multicentre, open-label, randomised clinical trial. *Lancet*. 2021 Nov 27;398(10315):1965-1973. doi: 10.1016/S0140-6736(21)02394-1