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BRIEF COMMUNICATION

Acute Pancreatitis as a Complication of Intragastric Balloons: a Case Series

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Abstract
Intragastric balloon (IGB) placement for the treatment of obesity has been in use for more than three decades. The major advantage of IGBs is that they preserve the anatomy of the stomach and are generally considered safe; the most common complications are nausea/vomiting and abdominal pain, and very rarely are IGBs associated with mortality (0.05%). A total of 14 cases of pancreatitis complicating IGBs have been reported in the literature. In this series, we reported 10 patients who developed acute pancreatitis in association with IGBs of which half were treated conservatively without the removal of the IGBs.

Keywords Obesity · Balloons · Pancreatitis · Complications

Introduction

Intragastric balloons (IGBs) are space-occupying devices that are either filled with saline or nitrogen gas. The fluid-filled IGBs work in many ways including slowing the rate of gastric emptying from the stomach; thus, patients consume smaller meals and feel satiety for a longer period of time. IGBs are associated with marked short-term weight loss [1, 2] and have the advantage of preserving the normal anatomy of the stomach and are considered safe. The most common adverse events were reported in a meta-analysis to be nausea/vomiting in 23.3% while abdominal pain in 19.9%. Serious complications were rare: mortality in 0.05% and gastric perforation in 0.1%.

Pancreatitis following IGB is very rare. A total of 14 cases of acute pancreatitis were reported in the literature [3]. To further increase the awareness of this complication and management, we report cases of acute pancreatitis that developed after the insertion of IGBs.

Case Series

A number of gastroenterologists working throughout Saudi Arabia gathered patients in their practice who had developed acute pancreatitis after the insertion of IGBs; a total of ten cases were reported and were followed up till the resolution of their symptoms. The diagnosis was made if patients had typical epigastric pain of sudden onset and elevated serum lipase or amylase. All patients presented with epigastric pain and 30% with both pain and vomiting. None of the patients gave a history of alcohol ingestion. All patients had normal liver enzymes and bilirubin levels and ultrasound examination was performed on all of them and none had any gallstones or biliary dilation upon presentation. Other common secondary causes of acute

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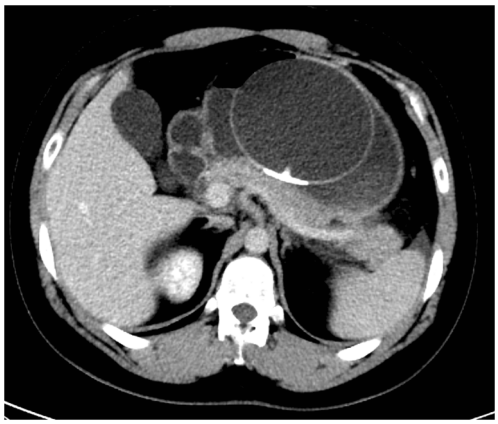

Fig. 1 The intragastric balloon is seen in place in a patient who developed pancreatitis

pancreatitis such as hypercalcemia and hypertriglyceridemia were also excluded with normal laboratory values.

In five patients, a computerized tomography (CT) scan of the abdomen was performed. All patients showed interstitial pancreatitis with fat standing without evidence of pancreatic necrosis (Fig. 1). In none of the cases was there IGB migration beyond and pylorus, nor was there any leak in the IGBs. Five patients required balloon removal due to significant abdominal pain and vomiting. Other patients were managed conservatively with intravenous fluids and analgesia for few days and discharged home. There were no reported complications such as gastric perforation, pancreatic necrosis, acute respiratory distress syndrome, or renal impairment. Eight patients had a BISAP score of 0 (Table 1). The mean age of the affected patients was 31.4 years (range 23 to 44 years), and eight of them were females. Eight patients had fluid-filled balloons with a mean volume of 564 ml while two patients had air-filled balloons with an average volume of 580 ml.

Discussion

IGB have been on the market for more than three decades with literature supporting the short-term benefits of IGBs in reducing excess body weight. A meta-analysis of 17 studies demonstrated an excess weight loss of 25.4% (95% CI; 21.5 to 29.4%) and a total weight loss of 11.3% (95% CI; 8.2 to 14.4%) at 12 months after balloon placement [1]. IGBs allow patients to sense fullness and ultimately reduce their food intake as well as they facilitate satiety peripherally by being an obstacle to food consumption, decreasing intragastric volume, and delaying gastric emptying.

This case series further validates that acute pancreatitis, although rare, can occur as a complication of IGBs and occurred with different manufacturers as well as with gas filled IGBs. Furthermore, acute pancreatitis occurred at various time spans after the insertion of IGBs and did not appear to be related to the volume of the IGB which is concurrent with previously reported cases where pancreatitis developed within 1 day to 11 months after the insertion of the IGB [3]. It is thought that acute pancreatitis from IGB use is due to the mass effect from the balloon on the pancreas or it could be due to dislodgment of catheter to the second part of the duodenum [3].

From the 14 cases reported, 10 were females, 10 cases developed mild pancreatitis, and in all except one, the IGBs were removed [3–9]. In this case series, most of who developed pancreatitis were females, and they presented within 1 day to 494 days after the insertion of the IGB, with a mean of 62 days. Their BISAP score ranged between 0 and 2. Five patients in this series were treated conservatively without the removal of the IGBs, which is not a common management approach in cases reported in the literature. This case series questions the practice of removal of IGBs after an episode of acute pancreatitis, as it might have no impact on the natural

Table 1 Details of patients who had acute pancreatitis after intragastric balloon insertion

	Age	Sex	Symptoms at presentation	Type of IGB	Volume (ml)	BMI at insertion	BMI at removal	Duration of IGB (days)	Serum lipase level (IU/L)	BISAP score	Management
1	23	Female	Epigastric pain	Allergan	600	28	28	84	1100	0	IGB removal
2	23	Female	Epigastric pain, vomiting	Spatz	450	24	22	120	1406	0	Conservative
3	24	Female	Epigastric pain, vomiting	Spatz	600	36.4	36.4	1	1853	1	Conservative
4	29	Female	Epigastric pain, vomiting	Heliosphere	660	34	33	4	916	0	Conservative
5	30	Female	Epigastric pain, vomiting, fever	MedSil	600	33	33	5	249	2	IGB removal
6	30	Female	Epigastric pain	Obalon	500	34	33	90	808	0	Conservative
7	35	Male	Epigastric pain	Allergan	600	36	33	35	>10,000	0	Conservative
8	38	Male	Epigastric pain	Spatz	500	44	43	240	526	0	IGB removal
9	39	Female	Epigastric pain	Orbera	600	40	38	5	149	0	IGB removal
10	44	Female	Epigastric pain, Nausea	Orbera	600	38	36.5	11	195	0	IGB removal

history of pancreatitis. At the same time, as this is usually an elective procedure for weight loss, it is understood that both the healthcare provider and the patient might be hesitant to continue with the IGB and it should be a shared decision between both.

It is important to note that a CT scan is not required to make a diagnosis of acute pancreatitis if clinical history and biochemical profile supports such a diagnosis. If a CT scan is performed, as was the case in five of the 10 cases, it was to exclude another etiology as IGBs are not a common cause.

As this was a compilation of cases from gastroenterologists throughout the country, we did not have the denominator to estimate the incidence of acute pancreatitis after the insertion of IGBs. Rather, the aim of the manuscript was to describe the outcomes of acute pancreatitis in the setting of IGBs.

Although pancreatitis is not a common complication from IGB insertion, this diagnosis needs to be kept in mind in patients presenting with significant abdominal pain, nausea, and vomiting after IGB insertion. The United States Food and Drug Administration has issued a safety warning of pancreatitis from Orbera and Reshape balloons and it has been considered that air-filled balloons are unlikely to cause pancreatitis but two patients in this case series were air-filled balloons.

In conclusion, the possibility of acute pancreatitis in patients presenting with abdominal pain and or vomiting after IGB insertion should be entertained. In some cases, conservative treatment can salvage IGBs without removal and most cases are mild in severity.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval For this type of study, formal consent is not required.

Informed Consent Statement Does not apply.

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