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Case Report

Acute pancreatitis as an unusual early postoperative complication after single anastomosis duodeno-ileal with sleeve gastrectomy with duodenal bulb preservation

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ABSTRACT

Acute pancreatitis (AP) is an infrequent complication after bariatric surgery and is associated with procedures that require close dissection to the pancreaticoduodenal area. Herein this case report presents a case of a 35-year-old male who developed severe acute pancreatitis with necrosis after a Single anastomosis duodeno-ileal with sleeve gastrectomy (SADI-S) procedure with preservation of the duodenal bulb. This complication may result from thermal injury during duodenal dissection near the pancreatic head. Early recognition and careful duodenal dissection using harmonic energy with short bursts and cooling intervals are key to prevent this rare but severe postoperative complication.

Keywords: SADI-S, Acute pancreatitis, Bariatric surgery

INTRODUCTION

Postoperative bariatric surgery patients have a higher risk to development pancreatic and biliary disorders, due to increased bile saturation caused by quick weight loss, including pathologies such as gallstones, choledocholithiasis, cholangitis or biliary pancreatitis; or due to complications associated with fibrosis, manifested as Vater ampulla stenosis and Oddi sphincter dysfunction. Although there are published case series describing the clinical course of acute pancreatitis (AP) and related therapeutic interventions in bariatric patients, there is little information about the incidence or risk factors in this group.[1,2] Single anastomosis duodeno-ileal with sleeve gastrectomy (SADI-S) is a modification of the traditional duodenal switch (DS) surgery and is a relatively new bariatric surgical procedure that has shown excellent results in sustained long-term weight loss and comorbidities remission with a lower complication rate; these benefits are attributed to the creation of a single ileoduodenal anastomosis since the most frequent complications are related to it, such as: bleeding, leak, stenosis or intestinal obstruction, which also decreases with the reduction of internal hernias by having a lower number of mesenteric gaps.[3,4] Among the complications of the mediate postoperative period, AP is very rare and is usually related to biliopancreatic loop obstruction and biliary stones in the common bile duct; most of these cases are solved without complications (80%) but in the case of severe pancreatitis (20%) the complications can be catastrophic and leads death (3%).[5]

Due to the performing SADI-S technical characteristics, we infer that the rising risk of AP is related to the duodenum dissection in proximity to its second portion. Currently there are no reported cases in the literature regarding AP in SADI-S surgery. This rare complication is described below in a procedure with extended preservation of the duodenal bulb technical variant.

CASE REPORT

A 35-year-old man with a body mass index (BMI) of 42 kg/m^2 who has been obese since childhood, no comorbidities associated. He had a vertical sleeve gastrectomy performed in 2018 with a weight loss of 50 kg, BMI nadir of 25.4 kg/m^2 and complete regain of EWL% at the time of conversion surgery: SADI-S with preservation of the duodenal bulb. The patient had a history of gallstones with biliary colic on 2 occasions, the ecography showed no exacerbation sign, so a retrograde cholecystectomy was performed during this intervention without incident. During surgery, a duodenal dissection was performed with a harmonic scalpel from 7 cm distal to the pylorus in order to keep the bulb intact (unlike the original technique where a duodenotomy was performed 2 to 3 cm from the pylorus), creating a tunnel for the stapler cutting. This critical step was difficult to perform due to slight bleeding from the pancreaticoduodenal vessels, it was controlled by ultrasound energy. A duodenal transection was performed with an Ethicon® blue cartridge and the duodenoileal anastomosis was confection 2 cm wide at 300 cm from the ileocecal valve with manual closure using PDS 3-0 in a continuous suture plane. The rest of the procedure was configured without incidents.

In the immediate postoperative period, the patient presented moderate epigastric pain, nausea and vomiting. Serum studies were performed 24 hours after surgery: lipase (900 IU/ml), amylase (425 u/l), C-reactive protein (CRP) of 247 mg/l, electrolyte panel, renal and liver function in normal rank. A diagnosis of mild AP was made according to Atlanta criteria. Intravenous fluid resuscitation, analgesia with opioid derivatives, thromboprophylaxis with low molecular weight heparin and intermittent pneumatic pressure stockings were given. A leak test was performed with a barium swallow, showing correct contrast dye transit without leaks. The oral route was continued with exclusive clear liquids. At 48 hours after surgery, the patient presented tachycardia with an average HR of 130 bpm, BP 135/78 and exacerbation of abdominal pain; an abdominal computed tomography (CT) scan with contrast was performed identifying pancreatic necrosis above >50% with the presence of 2 peripancreatic collections (Figures 1a and b).

The complete blood count showed leukocytosis of 18×109/l, creatinine of 1.9 mg/dl and oliguria (0.3 ml/kg/hour), so the patient was admitted to the ICU. On the 5th postoperative day, abdominal pain got worse radiating like a belt to the right flank, Cullen's sign, blood output of 900 cc/2 hours through a closed drain with hemoglobin decrease from 14.8 to 11.1 g/dl (Figure 2).

Given the clinical picture suggestive of hemorrhagic PA, emergency surgery was performed. During diagnostic laparoscopy, multiple intra-abdominal collections were found (right subphrenic, subhepatic and peripancreatic) with a chocolate-like appearance and clots on the pancreas head with no active bleeding were evident (Figure 3).

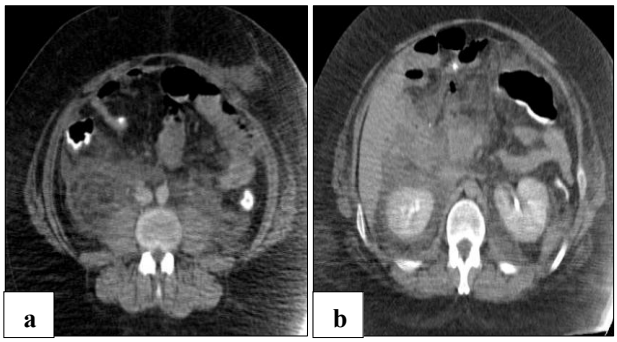

Figure 1 (a and b): Contrast-enhanced abdominal computed tomography. There is an increase in volume at the head of the pancreas with poorly defined hypodense areas suggestive of collections involving approximately 50% of the parenchyma associated with a peripancreatic and right perirenal collection. Balthazar grade e.

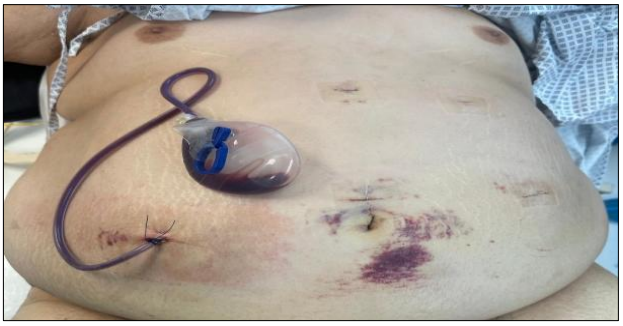

Figure 2: Periumbilical ecchymosis associated with hemorrhagic necrotic pancreatitis (Cullen's sign). The bloody appearance of the discharge from the Blake-type drainage is observed.

Cultures were taken; drainage was performed until the cavity was cleaned. After 24 hours, the patient presented sudden dyspnea, tachycardia, chest pain with D-dimer of 4000 ug/ml, leukocytosis, and persistent renal failure that led to AMI without reversal with resuscitation maneuvers.

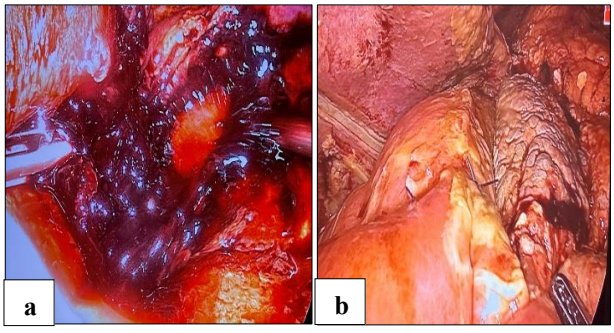

Figure 3: (a) presence of a clot firmly adherent to the surface of the pancreatic head with evidence of recent bleeding, and (b) cobblestone and devitalized appearance of the surface of the head and body of the pancreas adjacent to the duodenoileoanastomosis site. pancreatic necrosis.

DISCUSSION

Bariatric surgery has proven to be the most effective treatment to achieve and maintain long-term weight loss as well as the resolution of comorbidities associated with obesity; however, there are patients in risk to regain weight that could require revisional surgery. SADI-S has become a bariatric surgical procedure with good results for these patients, being an excellent option for recurrence after gastric sleeve.[6] There are technical aspects in SADI-S that favor its choice compared to other procedures such as Roux-en-Y gastric bypass (RYGB); one of these advantages are the pyloric preservation with its function of controlling the passage of partially digested food from the stomach to the small intestine, in addition to having a longer hypoabsortive intestinal segment when creating a duodenoileal anastomosis. However, these advantages are related to its drawbacks since greater skill is required to manipulate the duodenum, increasing the risk of early complications and the tendency to vitamin deficiency in the long term.[7] Intraoperative complications include bleeding from the staple line and pancreaticoduodenal vessels, intestinal leakage and injuries to adjacent organs such as the common bile duct, other duodenum portions or even the pancreas, where the minimum contact may trigger bleeding or enzymatic activation.

Mediate complications (up to postoperative day 7) include leakage, hemorrhage, fistula, and rarely, AP as in the present case. Late complications (up to day 30 after surgery) include surgical site infection, leakage, stenosis, internal hernia, GERD, or nutritional deficiency.

The recorded incidence of AP in the early postoperative period after SADI-S is low (1.04%).[2] In a case series report only 138 of 3765 patients (3.6%) developed postoperative pancreaticobiliary complications, and of these, only 10 cases (0.27% of the total) developed AP in an average of 1.8±1.4 years.[7] The relationship of cholelithiasis, female sex, age >50 years and RYGB were identified as predictive factors of these complications.

In a cohort study to evaluate AP after bariatric surgery, it was shown that only 28 patients (1.04%) of 2695 suffered from it in a population with a median follow-up of 3.5 years. Quick weight loss and the presence of gallstones were identified as important risk factors; however, this study does not specify the exact time of AP development or the etiology.[3]

The established technique for SADI-S with extended preservation of the duodenal bulb involves the dissection of the duodenum from the anterior pancreas surface in the head-neck area where the gastroduodenal artery and the duodenal branches of the superior and inferior pancreaticoduodenal arteries are located; this technical variant has been useful in cases where retrobulbar fibrosis is found, so it is decided to perform the duodenal transection 7 cm from the pylorus, proximal to the papilla, attributing to it an improvement in the absorption of minerals and trace elements, maintaining a better nutritional status compared to classic SADI-S with excellent results in weight loss and comorbidities remission.[8]

Dissection and electrocoagulation must be performed slowly and carefully with the harmonic scalpel. This ultrasonic energy device generates heat from high-grade friction with lateral thermal spread that can reach up to 100º C and can easily damage vital structures or generate a transmural burn in the serosa and muscularis layer of the duodenum itself, with or without perforation.[9,10]

The proximity of the pancreatic body to the duodenal wall and the extension of diathermy from coagulation of the vessels to the adjacent pancreatic tissue is the most likely cause of the complication that developed in the present case. The transmitted heat could destroy acinar cells and trigger trypsin activation.

There are several technical strategies to prevent extensive thermal injury to the duodenal wall. One of them is with pneumatic dissection using pneumoperitoneum CO_2, allowing its infiltration in the layer of visceral peritoneum facilitating the split of duodenal serosa and pancreas surface while setting the harmonic scalpel dissection slowly with waiting times after taking each new tissue sample from the transcavity opening. Another suggestion is to perform tissue coagulation for short periods, which prevents the harmonic scalpel tip from heating above 45 ºC. It should always perform a slow and precise dissection avoiding the intestinal wall or pancreatic parenchyma exposure to the damaging effects of diathermy. Blunt dissection should not be considered in this area without underestimating the increased risk of bleeding or enzyme activation secondary to this manipulation.

The presence of intense epigastric abdominal pain after the surgical procedure should be considered as a diagnostic possibility of AP of traumatic etiology, and the diagnostic protocol should be carried out immediately with clinical criteria, taking pancreatic enzymes and/or performing imaging studies as appropriate to apply the Atlanta criteria.

our case, the diagnosis was made based on clinical and laboratory findings (2 of 3 criteria) classifying the AP as mild, however, the clinical deterioration and worsening of symptoms was an indication to perform an abdominal CT scan with contrast, reclassifying the case as severe AP with local complications, Baltazar E type (necrosis zone greater than 50% of the parenchyma).

A hematocrit decrease associated with intense abdominal pain and blood loss through drainage are indicators of hemorrhagic pancreatitis, leading to urgent surgical exploration and management of hypovolemic shock; these cases causing bleeding secondary to pseudoaneurysms ruptured of the wall of extensive areas of pancreatic necrosis.

CONCLUSION

AP in the early postoperative period of SADI-S is a rare but serious and potentially fatal condition. One of the critical points of the procedure is the duodenal dissection in its posterior plane, so the intimate proximity of the pancreas must be considered while dissection of pancreaticoduodenal vessels is performed, and thus additional measures must be taken to minimize the risk of deep thermal injury to the pancreatic parenchyma or duodenal wall. These care points may include short periods of coagulation and pneumatic dissection with CO_2 of the pneumoperitoneum when opening the omentum transcavity.

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