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Sub Occlusive Syndrome Secondary to Petersen's Hernia with Compromised Intestinal Loop: Case Report

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Abstract

Objectives: *to present experience of the management of patients with intestinal occlusive symptoms through rapid clinical stabilization, early diagnosis through imaging, and early suspicion of this complication in gastric bypass or laparoscopic bariatric surgery.*

Materials and methods: *male patient of 46 years; gastric bypass surgery one and a half years before consulting for symptoms of suboclusive syndrome. Record of previous medical history; direct communication with the patient.*

Results: *after emergency surgery, discharge the next day without immediate postoperative complications.*

Discussion: *it is proposed as a strategy to always close the petersen space, as it is the most frequent place of immediate internal hernias after laparoscopic gastric bypass surgery.*

Conclusion: *in patients undergoing laparoscopic gastric bypass, always suspect this pathology if the patient reports related symptoms. Make early diagnosis in advance and quickly, through available imaging studies, to avoid serious and eventually fatal complications.*

Keywords: *petersen's hernia. Laparoscopic bariatric surgery. Roux y gastric bypass. Intestinal sub occlusion.*

Introduction

The first description of this type of hernia was made by Bundee in 1897. This author published two cases of patients who died two weeks after surgery and recommended closing the retroanastomotic space with omentum. In 1900, Petersen described and illustrated two cases with the same outcome and warned of the closure of these spaces advising to leave an afferent handle as short as possible **(**1**)**. Internal hernias remain the most common cause of small bowel obstruction after laparoscopic gastric bypass. Internal hernias usually originate in three places: 1**)** the space in the mesenteric defect of the distal anastomosis **(**jejunum-jejunal**)**; 2**)** Peterson space **(**space behind Roux's handle**)**; 3**)** the space between the transverse mesocolic window. Antecolic placement of the Roux loop is associated with a lower risk of internal hernias **(**0.43%**)**, compared to retro colic placement **(**4.5%**) (**2**)**. The most frequent site of internal hernias after a retro colic bypass is the mesocolic tunnel; after an ante colic gastric bypass, it is the Peterson space **(**3**)**.

Clinical Case

A 43-year-old male patient who consults bariatric surgery with 126 kg of weight and a BMI of 40.7. Assisted by a multidisciplinary team, it manages to drop to 108 Kg, with a BMI of 36. Gastric bypass is consensual. Once the surgery has been performed, she is hospitalized for 2 days and then discharged without particularities. At 19 months after surgery, the office has BMI results of 25.3 kg/m2 **(**36 kg/m2 presurgical**)**, for abdominal pain of two weeks of evolution, colic type, pain in epigastrium, right hypochondrium and right flank, afebrile, spontaneous catharsis, and diuresis, without alterations. Absence of nausea and vomiting. Episodes of bloating. Ultrasound is performed in another hospital and no pathology is found. A CT scan of the abdomen and pelvis with contrast is performed. **(**Fig.1 and 2**)**. With suspected hernia of the Petersen space, post gastric bypass, emergency laparoscopy is indicated. Entrance laboratory, normal.

Pre-surgical chest x-ray: cardiothoracic relationship at normal limits; both lungs with good transparency; rows of normal anatomical configuration; free costophrenic angles. Electrocardiogram: tracing compatible with normality. Frequency of 60 beats per minute.

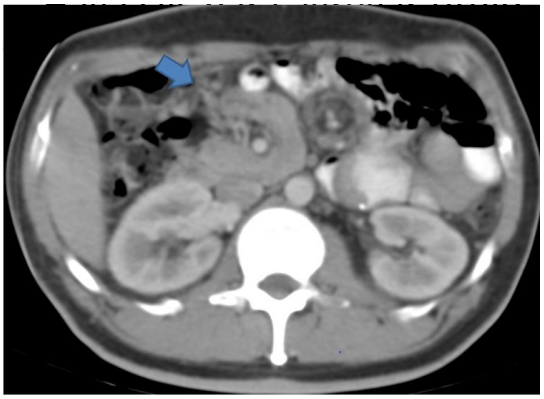

Figure 1. Abdominal CT with intravenous and oral contrast. Arrow: displacement to the right of the Treitz ligament.

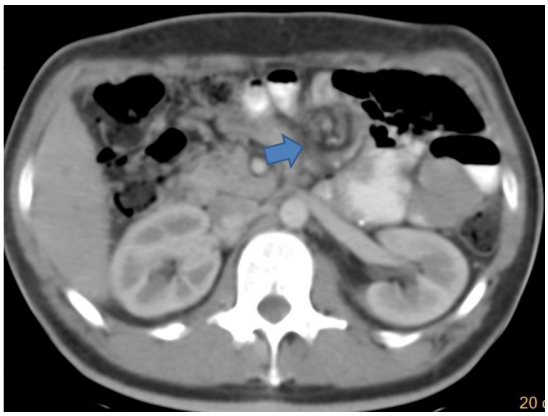

Figure 2. Abdominal CT with intravenous and oral contrast. Arrow: swirl sign at the root of the mesentery **(**Whirpool's sign**)**

Surgical Time

Exploratory laparoscopy is urgently scheduled. Under general anesthesia, asepsis, placement of surgical fields, pneumoperitoneum, CO2 insufflation with Veress needle is performed, a trocar of 12 mm and two of 5 mm is placed, patient in anti-Trendelenburg position. Quadrant exploratory laparoscopy is performed. There is a hernia of the Petersen space with almost the entire small intestine to the right including the foot of the Y of Roux and wall edema. **(**Fig 3**)**. The entire small intestine is reduced to its anatomical position, through delicate maneuvers. **(**Fig 4**)**. The mesenteric defect is sutured with a non-absorbable polyester 2.0 suture. **(**Fig 6**)**. The trocars are removed under direct vision: they do not bleed. The skin is sutured with nylon monofilament 3.0 **(**Dermal Lon**)**.

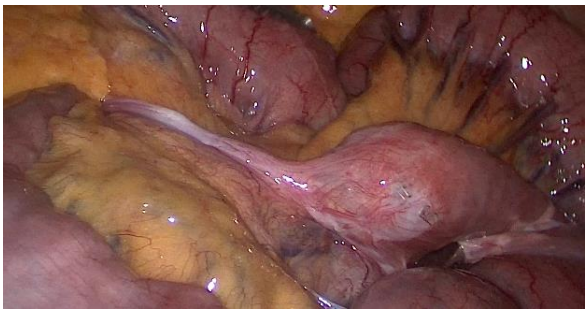

Figure 3. For the compressive defect on the vessels Edema of the meso with extravasated lymph

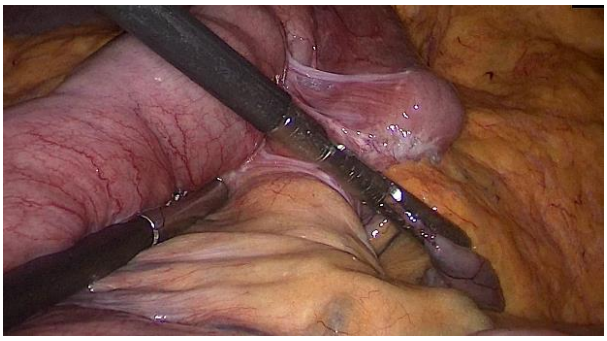

Figure 4. Traction of the distal ileum towards its normal anatomical position

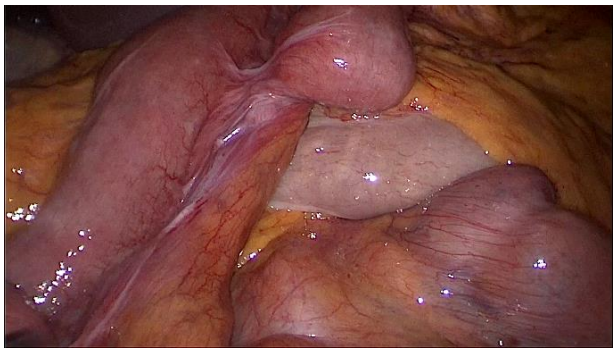

Figure 5. Petersen space: Space that forms between the food loop and the transverse mesocolon.

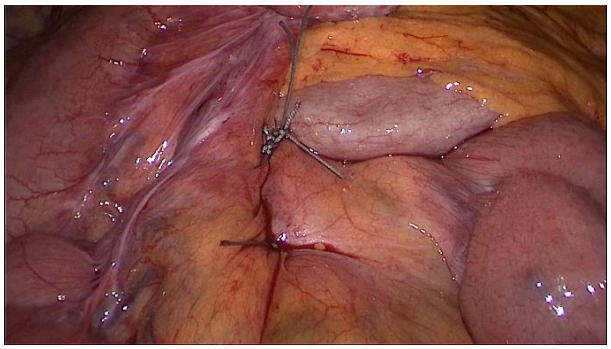

Figure 6. Petersen space closed with non-absorbable suture.

Discussion

There are three main types of transmesenteric hernias: the first and most common type is transmesocolic, which occurs in 0.7-3.25% of Roux's Y gastric bypass. The second occurs through a defect in the mesentery of the slender intestine, and the third, known as Petersen, through the transverse mesocolon **(**4**)**.

Petersen's hernia is a specific type of hernia where the small intestine protrudes to a potential space between the caudal surface of the transverse mesocolon and the ascended food loop when a Roux Y-reconstruction is performed. **(**5**) (**6**)**.

As with any major surgery, gastric bypass and other weight-loss surgeries pose potential health risks, both in the short and long term.

Longer-term risks and complications of gastric bypass may include intestinal obstruction; rapid gastric evacuation syndrome, which causes diarrhea, nausea, or vomiting; gallstones; hernias; low blood sugar **(**hypoglycemia**)**; malnutrition; stomach perforation; ulcers; Vomiting. In rare cases, complications of gastric bypass can be fatal **(**7**)**.

Internal hernias are presented as one of the most frequent complications in the context of a picture intestinal obstruction. Internal hernias occur more frequently after laparoscopic procedures because few adhesions are formed compared to open procedures and, in addition, because many surgeons fail to close these defects with a continuous non-absorbable suture **(**8**)**.

The clinic, along with the symptoms of internal hernias, is not very clear; moreover, they are non-specific **(**abdominal pain, nausea, and vomiting...**)** It can be confused with an acute abdominal picture such as appendicitis, pancreatitis, or biliary colic, among others, which makes diagnosis difficult if hernias are not suspected, which can have a fatal outcome for the patient if they are not recognized in the time since they produce, in some cases, intestinal ischemia **(**9**)**.

Radiological studies are usually normal or inconclusive. Tomographic findings are subtle and may include signs of intestinal obstruction, dilated intestinal segments, thickening, clumping of loops, in addition to distortion and engorgement of mesenteric vessels. Despite all these possible signs, the diagnosis of internal hernia by tomography is difficult **(**10**)**.

Diagnosis is complex due to variability in location and appearance. A common finding is the presence of intestinal loops clustered on the periphery of the peritoneal cavity, lateral to the colon, with central, inferior, and posterior displacement of the transverse colon. Displacement of mesenteric vessels can also be observed with winding and increasing the caliber of these **(**11**)**.

The "whirlpool sign" takes place when two intestinal loops rotate clockwise along with mesenteric fat and the superior mesenteric vein around the superior mesenteric artery. They can accompany findings

suggestive of complications such as free fluid, engorgement of mesenteric vessels, or mural thickening, among others. It has been described in the context of intestinal malrotation and volvulus of the small or large intestine of primary or secondary origin, closed-loop obstructions, in cases of enteritis, omental or ovarian torsion. The direction of the whirlpool is clockwise on ultrasound **(**seen from above, so to speak**)** and counterclockwise on CT **(**as if viewed from below**) (**12**) (**13**)**.

There is concern that closure of mesenteric defects may be associated with a higher rate of postoperative complications, such as mesenteric hematomas and hemorrhage **(**14**)**.

The risk of necrosis of long segments of the small intestine underscores the absolute need for early diagnosis and intervention, due to the associated increase in morbidity and mortality; there is intestinal obstruction and severe pain, as an example of how our patient consulted. The emergency surgical examination is mandatory. Most patients can be treated laparoscopically and treatment should target the underlying disease, with hernia reduction and closure of all mesenteric defects. An intestinal resection may be necessary if necrosis is observed in the surgical examination **(**15**)**, which in our patient was not performed, due to timely diagnostic behavior and treatment.

Conclusion

In the case presented, the closure of the Petersen space, by laparoscopic surgery that leaves the small intestine in its corresponding anatomical position by means of a non-absorbable suture, helped a faster recovery and thus avoid consequences such as intestinal necrosis that can trigger death if they were not detected in time. Imaging such as CT is an excellent means of diagnosis. The key is to always suspect the problem and submit it to laparoscopic correction early. The closure of all mesenteric spaces, during surgery, can reduce the incidence.

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