

Candy Cane Syndrome and Jejuno-Jejunal Anastomosis Stump Intussusception in a Roux-en-Y Gastric Bypass - Case Report

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ABSTRACT

Background: A popular bariatric procedure for obese patients is the Roux-en-Y gastric bypass (RYGB). The RYGB technique includes creating two anastomoses, which may result in blind pouches at the level of the anastomoses.

Case presentation: We present the case of a 36 years old patient with history of RYGB who presented episodes of abdominal cramps accompanied by postprandial nausea and vomiting in the epigastric area and left iliac fossa and flank. We found a dilation of the gastro-jejunal stump anastomosis and of the jejuno-jejunal anastomosis stump that were resected. The postoperative course was uneventful with complete resolution of the symptoms.

Discussions: Adult patients with intussusception report with non-specific and typically chronic symptoms. The most crucial feature of pain is its episodic, intermittent nature, which makes diagnosis difficult. Abdominal mass is observed in 24% to 42% of patients. The pathophysiology of the dilatation of the gastro-jejunal stump anastomosis is entirely mechanical: a lengthy, poorly positioned blind loop preferentially channels luminal contents, increasing pressure and producing dilatation, discomfort, regurgitation, postprandial vomiting, and weight loss. In case of jejuno-jejunal Intussusception the most common causes of obstructions are internal hernias and post-operative adhesions.

Conclusion: Symptomatic gastro-jejunal stump dilatation and jejuno-jejunal stump intussusception on the same patient is unusual. Both endoscopic and surgical solutions can be proposed.

Keywords: Roux-en-Y gastric bypass, bariatric surgery, anastomotic stump, dilatation intussusception

BACKGROUND

A popular bariatric procedure for obese patients is the Roux-en-Y gastric bypass (RYGB). The RYGB technique includes creating two anastomoses, which may result in blind pouches at the level of the anastomoses. These blind pouches, may be involved in postoperative discomfort and morbidity. Other problems encountered are internal hernias, adhesions, constriction, or twisting of the anastomosis (1).

An uncommon morbidity of this operation is candy cane syndrome (CCS), which happens when the blind limb of the gastro-jejunal anastomosis is abnormally long. The dilated stump will onto undigested food remnants and predispose to the bacterial proliferation. Typically the symptomatology is

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represented by postprandial epigastric discomfort, dysphagia, regurgitation nausea, and/or vomiting (2). These are non-specific symptoms of CCS, which is usually regarded as a rule-out diagnosis (3).

Adult intussusception is rare, accounting for about 5% of total occurrences and 1-5% of adult intestinal blockages. The majority of adult intussusceptions are caused by tumours, inflammatory bowel illness and anatomical anomalies like Meckel's diverticulum or movable caecum. Intussusception following RYGB is an uncommon cause of intussusception, with a growing prevalence (4).

We present a case of a patient who presented a cady cane syndrome due to the dilatation of the gastro-jejunal stump and in the same time multiples episode of intussusception of the jejuno-jejunal stump. We performed an exploratory laparoscopy with the resection of the gastro-jejunal and jejuno-jejunal anastomosis stump.

CASE PRESENTATION

A 36 years old patient presented in Digestive Surgery consultation for multiples episodes in the latest months for abdominal cramps accompanied by postprandial nausea and vomiting. The pains were localised in the epigastric area, but also in the left iliac fossa and flank. The presence of left fossa and flank pains were accom-

panied by constipation and abdominal bloating with spontaneous resolution after a few days. The pains were relieved by a liquid diet. Presence of episodes of gastro-oesophageal reflux.

The patient had a RYGB by laparoscopy for morbid obesity in 2022, with a weight loss of 40 kg. Medical history of cholecystectomy for gallbladder lithiasis and caesarean section. On clinical examination, evidence of a depressible abdomen with the presence of an reducible umbilical hernia with fatty content. No mass at clinical examination or any abnormalities.

A gastroscopy revealed a post gastric bypass gastro-jejunal stump dilatation of 3-4 cm. No lesions or ulcerations on the gastric mucosa. The anatomopathological exam found chronic mild non-atrophic gastritis. Absence of *Helicobacter pylori* infection.

Oeso-gastro-jejunal opacification who found that the transit occurs normally. Enlargement of the gastric pouch as well as the jejunal loop anastomotic without sign of stenosis. Significant contrast product stasis at the level of the blind loop with jejuno-gastric reflux (*fig. 1*).

Abdominal CT scan found no peritoneal free fluid or air. Postoperative status of cholecystectomy and gastric bypass without complication. Highlighting at the level of the left parieto-colic gutter of an image of small bowel intussusception. In the absence of parietal thickening or mass, this appearance can be transient (*fig. 2*).

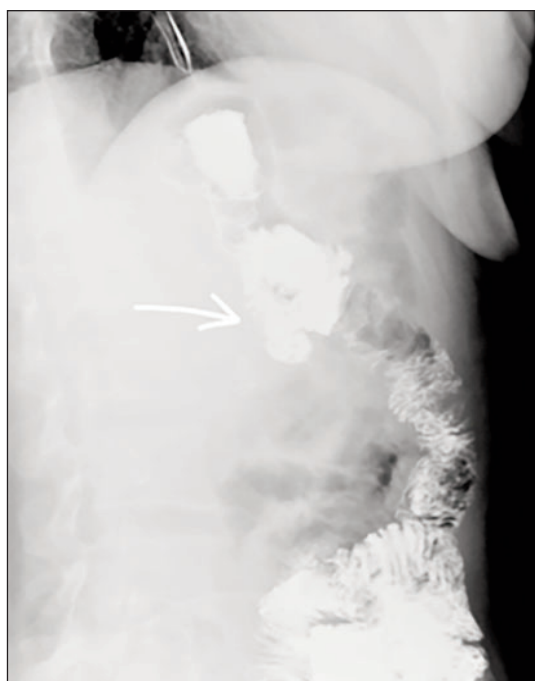


Figure 1 - Oeso-gastro-duodenal transit who reveal an dilated gastro-jejunal anastomosis stump

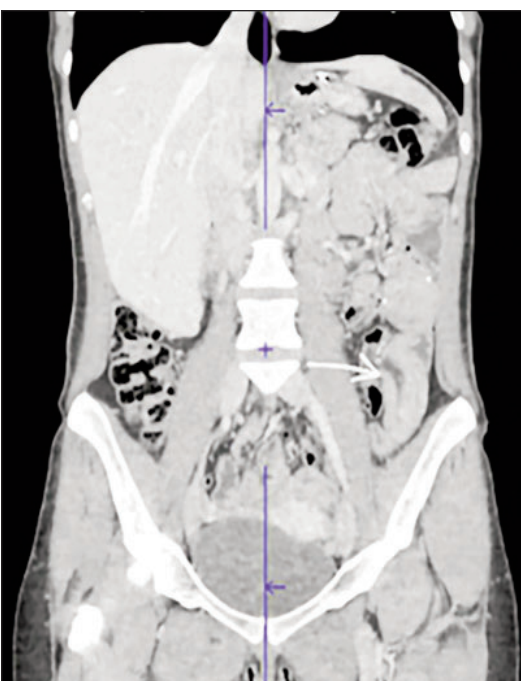


Figure 2 - Abdominal CT scan image who reveals the bowel intussusception in the left flank

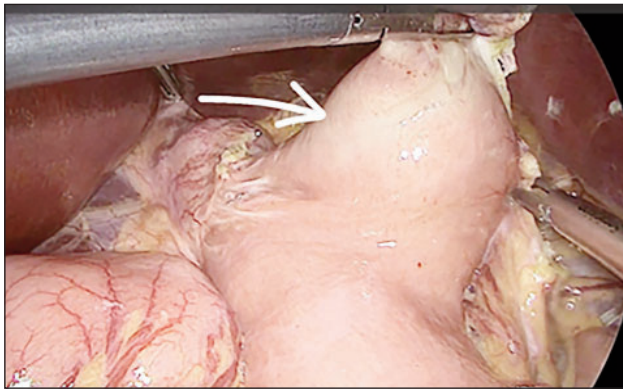


Figure 3 - Intraoperative image with the dilated gastro-jejunal anastomosis stump

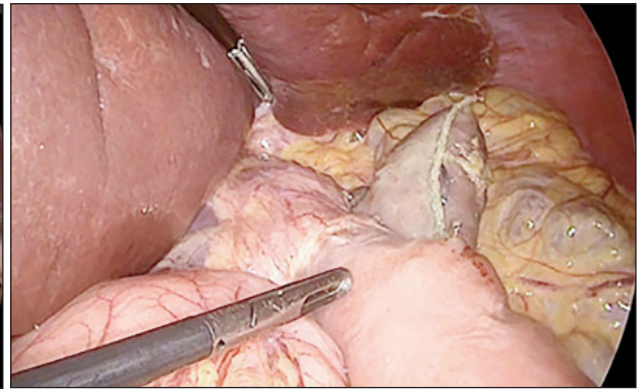


Figure 4 - Intraoperative image with the gastro-jejunal anastomosis stump resected with calibration on a 45 Fr Faucher tube



Figure 5 - Intraoperative image with the jejunio-jejunal anastomosis stump dilatation



Figure 6 - Intraoperative image post jejunio-jejunal anastomosis stump resection

We performed an exploratory laparoscopy. During the exploration we found a dilation of the gastro-jejunal stump anastomosis (*fig. 3*). A 45 French Faucher tube was placed in trans anastomotic in the alimentary limb for calibration. The stump was mobilised and resected using a stapler (*fig. 4*). The exploration also found a significant dilatation of the jejunio-jejunal anastomosis stump (*fig. 5*) that was resected (*fig. 6*).

The postoperative course was uneventful. The patient was discharged at the first operative day. The 3 months follow up revealed complete absence of previous symptoms.

DISCUSSIONS

Candy Cane Syndrome

Bariatric surgery using RYGB is one of the most prevalent weight loss techniques. Some patients experience postprandial nausea, vomiting, and epigastric pain. This is frequently explained by transitory

food intolerance, overeating, and anatomical abnormalities such as stricture or gastro jejunostomy marginal ulcer. In the context of gastro-jejunal stump anastomosis dilatation, the postprandial pain that subsides after vomiting, this is known to as "Candy Cane Syndrome" (5).

Probably, the pathophysiology of CCS is entirely mechanical: a lengthy, poorly positioned blind loop preferentially channels luminal contents, increasing pressure and producing dilatation, discomfort, regurgitation, postprandial vomiting, and weight loss. Given its nonspecific presentation, CCS is frequently diagnosed subjectively based on clinical symptoms in conjunction with the endoscopic and/or radiographic appearance of a long and dilated blind jejunal limb proximal to the anastomosis, known as the candy cane sign (6).

There are endoscopic techniques like suturing closure of the blind pouch, endoscopic revision of the gastro-jejunostomy to redirect food to the Roux limb, and the introduction of a lumen-apposing metal stent to connect the blind end to the efferent limb (7). These

might limit the acid reflux, aiding with weight loss, and diverting the flow of contents towards the enteral efferent limb (8).

The surgery consist in resection of the dilated stump next to the gastro-jejunal anastomosis. A calibration of the resection by Faucher 45 Fr tube, in necessary in order to avoid the anastomotic stenosis. CCS can be avoided by omitting an unnecessarily lengthy jejunal (blind) loop proximal to the anastomosis during the initial surgery. A blind loop of less than 3 to 4 cm is typically not linked with blockage and so does not produce CCS.

Jejuno-Jejunal Intussusception

The most common causes of obstructions are internal hernias and post-operative adhesions. One less frequent but potentially deadly RYGB consequence is jejuno-jejunal intussusception. In the literature, post-RYGBP intussusception incidences range from 0.4 to 0.7%, while internal hernia incidences range from 1 to 9% (9).

The aetiology is unclear and seems to be multifactorial, including a lead point (adhesions, food boluses, and suture lines), motility disturbances from the development of an ectopic pacemaker due to anatomical changes, and/or intestinal mesentery thinning from weight loss that permits increased bowel mobility and an unstable area surrounding the Roux limb site (10).

Adult patients with intussusception report with non-specific and typically chronic symptoms. The most crucial feature of pain is its episodic, intermittent nature, which makes diagnosis difficult. Abdominal mass is observed in 24% to 42% of patients (11).

In the normal adult population, intussusception is frequently antegrade (peristaltic), and the pathophysiology of the almost entirely retrograde (anti-peristaltic) character in post-RYGB patients is unknown. Bowel dysmotility is thought to be a major contributing factor. The duodenum, which is important for peristaltic pacesetting, is specifically bypassed when passing through the jejunum and re-anastomosing. This pacesetting is often initiated when food passes through the duodenum (12). Pacesetter potentials were driven retrogradely by ectopic pacemakers in the Roux limb, which may be the cause of backward intussusception. The distal end of the distal colon was propelled retrogradely by anti-peristaltic contractions caused by the ectopic pacemaker potential at the distal jejunojejunostomy site. The cause of jejunoileal bypass intussusceptions,

on the other hand, is not only antegrade but also made worse by incorrect fixation at the proximal end of the bypassed ileum. This was a stark contrast to the latter. Staple or suture errors, post-operative adhesions, or even electrolyte imbalances are additional possible causes (13). One segment of the bowel invaginating into a section that is directly adjacent is known as intussusception. The proximal portion that invaginates into the distal portion, also known as the intussusciens (receiving segment), is referred to as the intussusceptum (14).

Because of the high sensitivity, abdominal CT scan is useful for the diagnosis. Additional tests, such as plain film X-rays and ultrasounds, can also be useful in the diagnosis (15).

The reduction or resection with revision of the area of intussusception appears to be effective in acute settings, in less acute patients, the best treatment options are controversial (16).

In the presence of dilatation of both anastomotic limbs with mixed symptoms surgical exploration with resection of the limb is in our perspective the most efficient treatment.

CONCLUSION

Dilatation of the both gastro-jejunal and jejuno-jejunal anastomotic stump is unusual. The patients report non-specific and typically chronic symptoms. Endoscopic and surgical solutions can be proposed. In our case de preferred surgical exploration with resection.

Author's Contributions

SC: Conceptualization, Investigation. CD: Writing-original draft. TTB: Writing-review & editing. JM: Validation, Supervision. All authors read and approved the submitted version.

Conflict of Interest

The authors declare that they have no conflicts of interest.

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Consent to Participate

Informed consent to publish the case report from the patient was obtained.

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