Case Report

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A successful management of Candy Cane syndrome post Roux-en-Y gastric bypass: a rare case report

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Introduction and importance: Candy Cane syndrome (CCS) is a rare condition in which the proximal gastrojejunal attachment's afferent blind limb is elongated. This can lead to different symptoms, including nausea and vomiting, with less commonly described reflux and regurgitation symptoms.

Case presentation: A 38-year-old female presented with a chronic complaint of postprandial pain, discomfort, and reflux lasting for about 2 years after a previous Roux-en-y gastric bypass (RYGB) surgery. Upper endoscopy was done and raised suspicion for CCS. The patient underwent an exploratory laparoscopy, which confirmed the diagnosis. Surgical resection of the afferent limb was done, and all symptoms were completely resolved at the postoperative follow-up.

Clinical discussion: CCS is considered a rarely described complication that can occur after RYGB gastric bypass surgery. Diagnosing this condition includes performing upper gastrointestinal (GI) studies and endoscopy, which reveal a redundant afferent limb. Laparoscopy serves as a dual-purpose tool, confirming the diagnosis of CCS and providing a definitive curative intervention. Surgical resection has a high success rate, with evidence supporting its efficacy in relieving symptoms.

Conclusion: As the popularity of Bariatric surgeries rises, it is crucial to consistently consider CCS, despite its rarity, as a potential complication. Although diagnosing CCS can be challenging, physicians should maintain a high index of suspicion, especially in patients presenting with upper GI symptoms following metabolic surgeries.

Keywords: bariatric surgery, Candy Cane syndrome, case report, laparoscopy, Roux-en-Y gastric bypass

Background

Candy Cane syndrome (CCS) is a rare surgical complication that may occur after a gastrectomy or gastric bypass procedure, especially when the blind limb of the proximal gastrojejunal attachment is excessively long[1,2]. CCS is a poorly described complication with female predominance. However, with the increasing number of bariatric procedures, it may become more common[3,4]. In CCS, the progressive dilation of the blind afferent limb over time due to the accumulation of food can lead to nonspecific symptoms such as abdominal pain, nausea, and vomiting. The diagnosis of CCS can be made through a combination of methods, including the patient's medical history, clinical examination, abdominal ultrasound, computed tomography (CT) scans, and abdominal X-rays. However, barium swallow and upper gastric endoscopy occurred to be the most accurate. There are various differential diagnoses, including maladaptive eating behaviour, bacterial overgrowth, ulcers, and undiagnosed internal hernia.

Management is mainly surgical by resection of the dilated loop but it is technically complex due to adhesions or distorted anatomy that might increase the complications. The laparoscopic approaches can be feasible and safe to improve patient's

HIGHLIGHTS

- With the significant rise in obesity rates globally, there has been a parallel increase in the demand for bariatric surgeries worldwide.
- Candy Cane syndrome (CCS) is a rare complication that can occur after Roux-en-Y Gastric Bypass surgeries that may lead to a long blind loop proximal to the gastrojejunal anastomosis.
- CCS can present with different upper gastrointestinal (GI) symptoms including abdominal pain, nausea, and vomiting.
- Surgical resection is the definitive treatment, with laparoscopic technique being the preferred and safest one.

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recovery[1–5]. In this manuscript, we describe the case of a 38-year-old female patient who was diagnosed with CCS after Roux-en-Y surgery, focusing on clinical signs, treatments, and contributing valuable insights into this rare post-bariatric complication. The work has been reported in line with the Surgical CAse REport (SCARE) 2020 criteria[6]. Supplemental Digital Content 1, http://links.lww.com/MS9/A408.

Case presentation

A 38-year-old female patient presented to the hospital with main complaints of postprandial pain, discomfort, and reflux. Upon admission, the patient was found to be afebrile with normal vital signs. On physical examination, she had tenderness in the epigastric region. Laboratory tests were also normal. Past medical history revealed severe obesity, weighing 120 kg, for which the patient underwent a laparoscopic sleeve gastrectomy (LSG) procedure and lost about 50 kg. However, after the LSG procedure, the patient suffered from symptoms of lower esophagitis and gastric reflux, which were treated by Roux-en-Y gastric bypass (RYGB) procedure. During the first 7-8 months after RYGB surgery, the patient was asymptomatic and pain-free. However, later, she started experiencing the main current complaints of postprandial pain and reflux. These symptoms continued for about 2 years and failed to be resolved by medical therapy. To diagnose the patient's case, an upper endoscopy was requested, and normal gastric bypass anatomy was observed, aside from a blind afferent jejunal limb. During the endoscopy, the access to the blind loop was easy and direct, and the access to the roux loop was difficult and done after passing through an angulation. The rest of the endoscopic examination was unremarkable. These findings raised suspicion for CCS. Therefore, exploratory laparoscopy was performed by a general surgeon in the general surgery department, which revealed a blind afferent loop proximal to the gastrojejunostomy (Fig. 1). After dissecting surrounding tissues, the blind loop was obvious and long enough, measuring around 11–12 cm (Fig. 2), and thus confirming the diagnosis of CCS. The patient underwent surgical resection of the afferent limb (Fig. 3). At the post-operation follow-up appointment, she reported complete resolution of her symptoms.

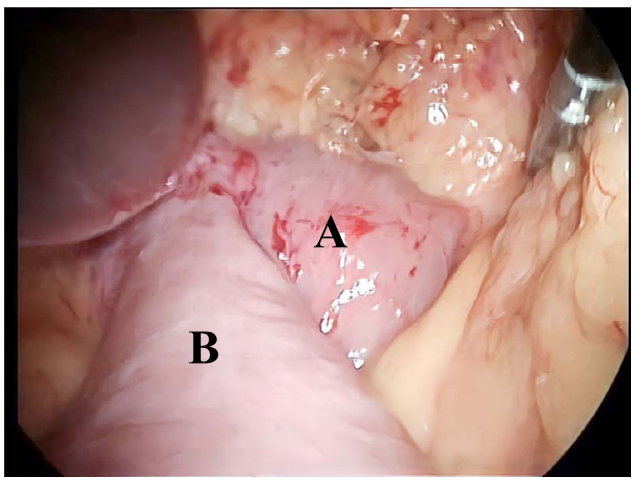

Figure 1(. A) Blind afferent limb loop. (B) Gastrojejunal anastomosis.

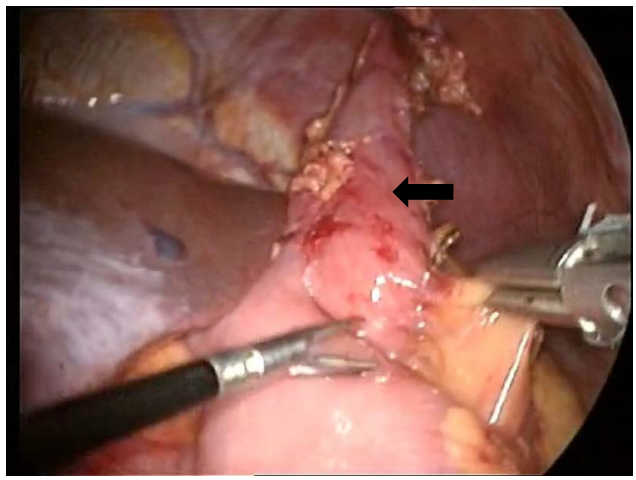

Figure 2. Black arrow indicating the long blind afferent loop measuring between 11 and 12 cm after dissecting the surrounding tissues.

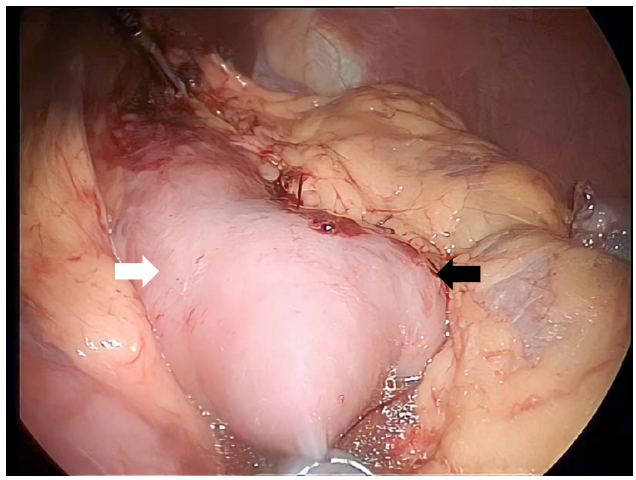

Figure 3. Black arrow indicating the resecting site of the long blind loop, white arrow indicating normal gastrojejunal anastomosis.

Intraoperative images of the laparoscopy procedure are depicted in the supplementary videos, Supplemental Digital Content 2, http://links.lww.com/MS9/A409, Supplemental Digital Content 3, http://links.lww.com/MS9/A410.

Discussion

CCS was first documented in a 2007 study describing a series of patients presenting with diverse gastrointestinal symptoms after they had undergone a Laparoscopic RYGB and end-to-end anastomosis to a jejunal loop construction[7]. Studies found that the most common symptoms associated with CCS were postprandial abdominal pain with nausea and vomiting, whereas the least common symptoms were reflux, regurgitation and/or weight loss. These symptoms that could be suspicious for CCS are reported from as early as 3 months to up to 11 years after their initial RYGB. The pathophysiology of CCS is partly mechanical, which means that the redundant afferent limb serves as a blind pouch

where food accumulates, which in turn increases the pressure within the lumen, leading to dilation[2,4,7]. The differential diagnosis of CCS includes anastomotic stenosis, dysmotility syndromes, and recurrence in oncologic gastrectomy cases. These diagnoses may have similar clinical presentations in terms of symptoms, which may include abdominal pain, nausea, and vomiting. Nonetheless, CCS is associated with an elongated afferent loop which can be seen through endoscopy or imaging studies[3].

Clinical diagnosis of CCS can be done using multiple diagnostic methods. The most common methods are upper gastrointestinal study and endoscopy. Other methods include CT scan, right upper quadrant ultrasound, and laboratory blood to rule out other causes of abdominal pain[2–4].

After the diagnostic tests have confirmed the diagnosis of CCS, the next step is to determine which surgical approach—laparotomy or laparoscopy—is the best. Compared to laparotomy, the laparoscopic method improves the surgeon's visualization of the hiatus and mediastinal dissection. Patients with CCS may undergo surgical excision of the redundant afferent jejunal limb as a treatment option. This diverts the oral intake into the alimentary limb[8].

The laparoscopic surgical approach has been shown to be safe and feasible, offering a minimally invasive option and leading to good symptom resolution in the majority of CCS patients[2,4].

A study conducted at the University Hospitals of Cleveland included 19 patients with CCS who underwent surgical afferent limb resection. The surgery was successful in 18 out of 19 patients, with a 94% success rate. This provides additional evidence that CCS is a real condition that improves with surgery[3]. Treating CCS by surgically resecting the redundant limb or constructing an enteral pouch is supported by a systematic review involving 13 studies. According to this review, the chosen interventions demonstrated efficacy in relieving symptoms, achieving success rates ranging from 73 to 100% across the examined cases. To prevent this complication, the surgeon should avoid a redundant extended jejunal loop proximal to the anastomosis during the initial operation and, after total gastrectomy, should construct a jejunal pouch[7].

Our case contributes significant value to the medical literature as it delves into the relatively uncommon complication of RYGB procedures. By examining the relation between upper gastrointestinal (GI) symptoms and a previous gastrojejunostomy, our study emphasizes taking CCS into consideration in such contexts. Furthermore, we highlight the efficacy of surgical resection as a highly successful intervention for CCS, providing comprehensive insights into its potential to achieve complete resolution of symptoms in the majority of cases.

Conclusion

As the popularity of bariatric surgery, specifically RYGB, continues to rise in the management of obesity, the incidence of CCS, a rare complication associated with these procedures, is at an increased risk. Therefore, maintaining a heightened awareness of CCS is essential, especially when evaluating patients with upper GI symptoms following bariatric surgeries. Laparoscopic resection of the blind loop emerges as a safe and effective treatment strategy for this syndrome.

Ethics approval

Ethics approval is not required for case reports at our institution.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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No funding was required.

Author contribution

Y.A.: Project administration, design of study, data collection, data interpretation and analysis, resources, software, validation, visualization, drafting, critical revision and approval of final manuscript. Q. S.: data collection, data interpretation and analysis, resources, software, validation, visualization, drafting, critical revision and approval of final manuscript. U.S.: data collection, data interpretation and analysis, resources, software, validation, visualization, drafting, critical revision and approval of final manuscript. S.C.: data collection, data interpretation and analysis, resources, software, validation, visualization, drafting, critical revision and approval of final manuscript. G.G.: data collection, data interpretation and analysis, resources, software, validation, visualization, drafting, critical revision and approval of final manuscript. F.S.: the supervisor; patient care, critical revision, and approval of the final manuscript.

Conflicts of interest disclosure

The authors declare that they have no conflicts of interest.

Research registration unique identifying number (UIN)

Not applicable.

Guarantor

Dr Fadi Souleiman is the guarantor of this work.

Data availability statement

Not applicable. All data (of the patient) generated during this study are included in this published article and supplementary information files.

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