



## Case report

## Unique long-term simultaneous complications of conventional Roux-en-Y gastric bypass after 27 years: A case report

Alejandro Flores Uribe<sup>\*,\*\*</sup>, Jorge Alberto González Arévalo, Carlos García Contreras, Ricardo Tello Mendoza, Oscar Armando Flores Uribe

General Surgery Department, Christus Muguerza Alta Especialidad Hospital, Monterrey, Nuevo León, México

## ARTICLE INFO

## Keywords:

Intussusception  
Cholecystitis  
Y-de-Roux  
Bypass  
Complications

## ABSTRACT

**Introduction:** We report a case of late concomitant complications caused by conventional Roux-en-Y gastric bypass and its managements.

**Presentation of case:** A 62-year-old male presented 27 years after conventional gastric bypass Y-de-Roux (BGR) with, sudden, moderate intensity abdominal pain, nausea, biliary vomiting and hyporexia. Persistent abdominal pain was constant, so a thoracoabdominal tomography was requested by the surgeon. It confirmed the presence of intestinal intussusception associated with lithiasis and cholecystitis. The patient reported having lost 45 kg since the BGR. He goes to the operating room for definitive management.

**Discussion:** The etiology of post-BGR intussusception is largely unknown, and multiple hypotheses have been created, such as the iatrogenic stitch created by the suture line in the entero-enteric anastomosis and the most common pattern found is antegrade. The use of contrasted CT as the most reliable diagnostic method.

**Conclusion:** The importance of taking into account the possible complications existing in bariatric patients and their frequency gives us the opportunity to suspect and detect them in time and in the most cases the management must be surgical.

### 1. Introduction

BYGR is one of the most effective surgical treatments for morbid obesity [1,2]. This procedure remains one of the most complex due to its post-operative complications, with relatively high morbidity and mortality rates [3].

Intussusception following BYGR was first described by Agha in 1986 [4]. It represents an unusual cause of intestinal obstruction after BYGR, having a prevalence of 0.07 % to 1.2 % [5,6]. There is a clear observation of a greater number of complications in open BYGR than in the laparoscopic version [7–13]. It is described that complications such as intussusception can be seen one year after surgery. There is a possible association between weight loss and greater risk of complications [14]. In addition, it has been hypothesized that this complication could be due to disturbances in the peristalsis caused by the Roux branch [15]. Other authors mention that the suture line in the jejunio-jejunosomy could act

as a reference point [16–17].

The symptoms of intussusception are not specific, and the clinical presentation can vary. Computed axial tomography (CT) being the study of choice, it shows the target sign in 80 % of cases [18].

There are different options of treatment. Jejuniojejunal anastomosis or resection of the damaged bowel is preferred over simple reduction due to its lower recurrence rate [19–21].

### 2. Case presentation

We present a 62-year-old male patient with a history of conventional BGR performed 27 years prior to his admission. He refers absence of pathological personal history of importance, and refers hereditary history of hypertension on his father's side. He denies history of drug addiction, alcoholism and smoking.

He started 8 h before his admission with abdominal pain of insidious

\* Corresponding author at: Universidad de Monterrey (UEM), Escuela de Medicina, Especialidades Médicas, Av. Ignacio Morones Prieto 4500, Jesús M. Garza, San Pedro Garza García, N.L. 66238, México.

\*\* Corresponding author at: Departamento de Cirugía General, Hospital Christus Muguerza, Alta Especialidad, Miguel Hidalgo 2525, Obispaño, Monterrey 64060, Nuevo León, Mexico.

E-mail address: [alexfloresuribe@gmail.com](mailto:alexfloresuribe@gmail.com) (A.F. Uribe).

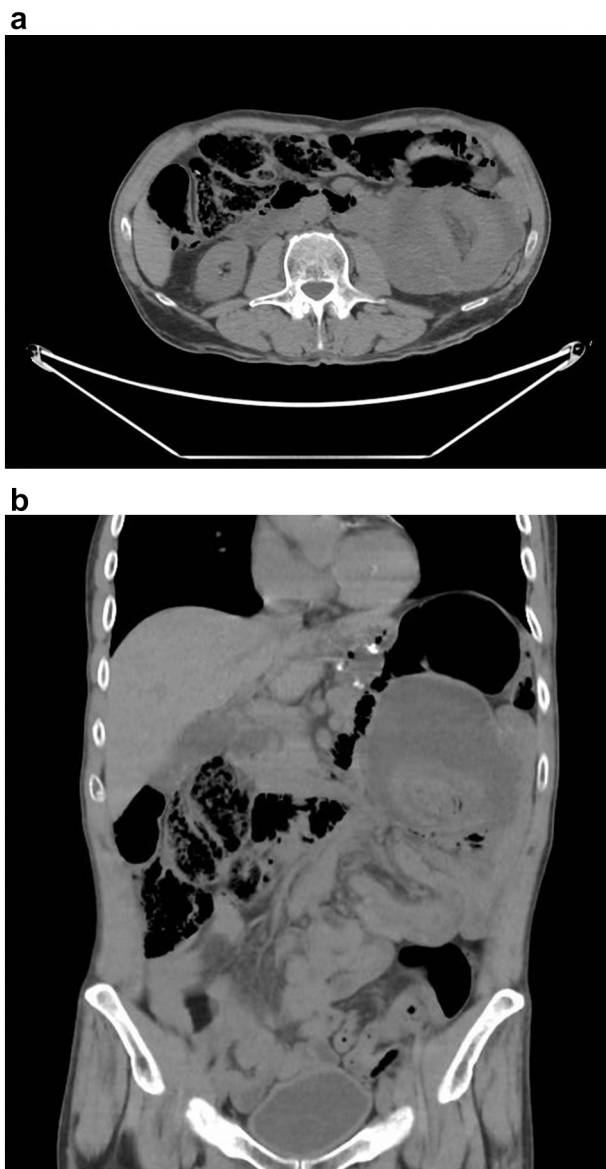
<https://doi.org/10.1016/j.ijscr.2022.107787>

Received 21 September 2022; Received in revised form 9 November 2022; Accepted 19 November 2022

2210-2612/© 2022 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

onset of moderate intensity, located in the mesogastrium, radiating to the epigastrium, aggravated by movement and food intake, partially attenuated with analgesics, accompanied by hyporexia, nausea and multiple vomiting of biliary content. He progresses 2 h earlier with increasing pain intensity, evolving high intensity, which is the reason why he goes to the emergency department. On arrival, the physical examination reveals a globose abdomen at the expense of distension with decreased peristalsis at auscultation, and peritoneal irritation demonstrated by positive rebound sign and positive Murphy sign. It was decided to perform a simple thoracoabdominal computed axial tomography, in which an image, suggestive of intestinal intussusception, was visualized along with multiple lumps and vesicular wall of 4 mm (Fig. 1).

For this reason, the patient was scheduled for diagnostic laparoscopy, which was performed by the 4th year general surgery resident. The procedure began with the placement of 5 trocars, 2 of 11 mm in the umbilical and subxiphoid region and 3 trocars of 5 mm in the left flank, right flank and right iliac fossa. Dilated small bowel loops were observed, with a transition area located 100 cm from the jejunum-jejunum anastomosis. Intussusception in the common loop was found.



**Fig. 1.** Thoracoabdominal computed tomography identifying intussusception of a small bowel loop and acute calculous cholecystitis. A: transverse section. B: coronal section.

Attempted laparoscopic reduction failed, thus converting to open surgery. An incision was made in the midline, supra and infraumbilical line. Abdominal planes were dissected, and after this a successful manual reduction is performed, areas of ischemia and transmural intestinal necrosis were observed in the intestine involved in the intussusception (Fig. 2A). For this reason, it was decided to perform a small bowel resection of approximately 70 cm. A later entero-entero latero-lateral T Barcelona anastomosis was performed with linear stapler, blue cartridge of 60 mm, 25 cm from the jejunum-jejunum anastomosis (Fig. 2B).

In a second stage, conventional cholecystectomy was performed with silk ligation of the duct and cystic artery (Fig. 2C). Drainage was placed over the anastomosis and the hepatic bed, which was extracted through the right iliac fossa port. Closure by planes was performed and the patient went on to recovery without any eventuality.

This patient evolved in a successful and satisfactory manner. The patient reports feeling noticeably better in his postoperative period, where he denies abdominal pain. He began to channel gas at 48 h and started a progressive tolerance to diet at 72 h postoperatively. He had an initial drainage of 20 cc serohematic liquid, with no data of systemic inflammatory response. The patient was discharged on the 4th postoperative day without drainage.

The postoperative recommendations involved drainage care, feeding and continuation of antibiotics. Post-surgical follow up was recommended to the patient through open consultation to the surgery department, however, his adherence has been poor. She has reported no complications or adverse effects of treatment.

The patient was informed about the interest of publication of this case. A written informed consent was obtained from the patient so that, with his authorization, this study could be published.

### 3. Clinical discussion

Intussusception is an under-reported complication of BGYR, but due to the increase in the number of bariatric surgeries in recent years, intussusception will become an increasingly prevalent complication [22].

What adds to the evidence in a report such as this is the recognition of the risk of complications in patients who, regardless of years of history of metabolic surgery, will be at risk for a complication such as the one reported above. Lifelong surveillance by the treating surgeon should be recommended based on the findings of this study.

The most common pattern found in intussusception is antegrade [21]. The etiology of post-BGYR intussusception is largely unknown, and multiple hypotheses have been created, such as the iatrogenic stitch created by the suture line in the entero-enteric anastomosis [23,24].

Other authors suggest Roux stasis syndrome as another possible etiology, theorizing that anomalous peristalsis of the Roux segment could create adjacent areas of high and low pressure allowing intussusception [25,26]. This supports our recommendation of physician follow-up in patients with a history of metabolic surgery.

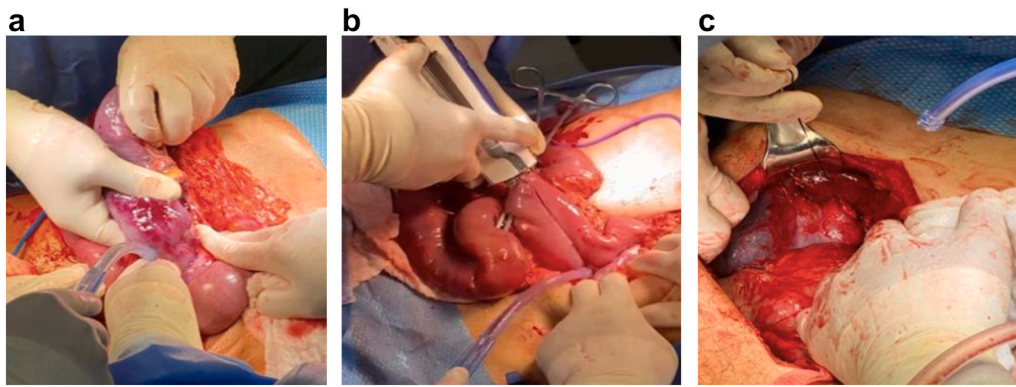
The use of CT, especially contrasted as the most reliable diagnostic method, is recommended and should be obtained as soon as possible in a post-BGYR patient with abdominal symptoms, bearing in mind that the bull's eye sign will not appear in intestinal hernia, which is much more common than intussusception and which may present with similar evidence [27,28].

This case report has been performed based on the SCARE 2020 criteria guidelines [29].

### 4. Conclusion

The importance of taking into account the possible complications existing in bariatric patients and their frequency gives us the opportunity to suspect and detect them in time.

Clinical presentation of acute calculous cholecystitis is more frequent in bariatric patients compared to intestinal intussusception, which is



**Fig. 2.** Loop of intestine with jejunojunal intussusception with evidence of ischemia and acute gallbladder. A: reduction of the loop. B: loop anastomosis. C: conventional cholecystectomy.

much rarer to suspect. In this case report, we present an infrequent presentation of both acute calculous cholecystitis and intussusception.

Once the diagnosis is suspected in someone who has bariatric history and has a clinical presentation of emergency acute abdomen, imaging studies could be avoided and definitive surgical management could begin immediately, avoiding an increase in possible complications, increasing the prognosis and quality of life of the patients.

#### Ethical approval

This study gets an ethical approval by the hospital's ethics committee already established.

#### Registration of research studies

It does not apply.

#### Guarantor

Dr. Alejandro Flores Uribe, M.D.

#### Sources of funding

This study did not receive any specific support from funding agencies, in the public, commercial or non-profit sector.

#### Ethical considerations

Protection of humans and animals: The authors declare that no experiments on humans or animals have been performed for this research.

#### Confidentiality of data

The authors declare that they have followed the protocols of their work center on the publication of patient data.

#### Right to privacy and informed consent

The authors declare that no patient data appear in this article.

#### Provenance and peer review

Not commissioned, externally peer-reviewed.

#### Credit authorship contribution statement

Dr. Alejandro Flores Uribe: Patient care, clinical case, writing.  
Dr. Jorge Alberto González Arévalo: Patient care, clinical case.

Dr. Carlos García Contreras: Writing and translation.

Dr. Ricardo Tello Mendoza: Writing and translation.

Dr. Oscar Armando Flores Uribe: Data analysis and writing.

#### Declaration of competing interest

The authors declare that they have no conflict of interest in the writing of this manuscript.

#### References

- [1] J.B. Freeman, M. Kotlarewsky, C. Phoenix, Weight loss after extended gastric bypass, *Obes. Surg.* 7 (1997) 337–344.
- [2] T.K. Curry, P.L. Carter, C.A. Porter, D.M. Watts, Resectional gastric bypass is a new alternative in morbid obesity, *Am. J. Surg.* 175 (1998) 367–370.
- [3] A.C. Wittgrove, G.W. Clark, U. Tremblay, Laparoscopic gastric bypass, roux-en-Y: preliminary report of 5 cases, *Obes. Surg.* 4 (1994) 353–357.
- [4] F.P. Agha, Intussusceptions in adults, *Am. J. Roentgenol.* 143 (1986) 527–531.
- [5] L. Daellenbach, M. Suter, Jejunojunal intussusception after roux-en-Y gastric bypass: a review, *Obes. Surg.* 21 (2011) 253–263.
- [6] O. Varban, A. Ardestani, D. Azagury, et al., Resection or reduction? The dilemma of managing retrograde intussusception after roux-en-Y gastric bypass, *Surg. Obes. Relat. Dis.* 9 (2013) 725–730.
- [7] Steeg K. Ver, Retrograde intussusception following roux-en-Y gastric bypass. Intussusception after roux-en-Y gastric bypass for morbid obesity: case report and literature review of rare complication, *Obes. Surg.* 16 (2006) 1101–1103.
- [8] M.A. Edwards, R. Grinbaum, J. Ellsmere, D.B. Jones, B.E. Schneider, Intussusception after roux-en-Y gastric bypass for morbid obesity: case report and literature review of rare complication, *Surg. Obes. Relat. Dis.* 2 (2006) 483–489.
- [9] J. Majeski, D. Fried, Retrograde intussusception after roux-en-Y gastric bypass surgery, *J. Am. Coll. Surg.* 199 (2004) 988–989.
- [10] J. Bocker, J. Vasile, J. Zagar, E. Goodman, Intussusception: an uncommon cause of postoperative small bowel obstruction after gastric bypass, *Obes. Surg.* 14 (2004) 116–119.
- [11] M.P. Hocking, D.M. McCoy, S.B. Vogel, J.V. Kaude, C.A. Sninsky, Antiperistaltic and isoperistaltic intussusception associated with abnormal motility after roux-en-Y gastric bypass: a case report, *Surgery* 110 (1991) 109–112.
- [12] J. Gorman, M. Greenwald, L. Gellman, D. Gadaleta, Antiperistaltic intussusception after roux-en-Y gastric bypass, *Am. Surg.* 70 (2004) 67–70.
- [13] T.M. Duane, S. Wohlgemuth, K. Ruffin, Intussusception after roux-en-Y gastric bypass, *Am. Surg.* 66 (2000) 82–84.
- [14] S. Singla, B.A. Guenthart, L. May, J. Gaughan, J.E. Meilahn, Intussusception after laparoscopic gastric bypass surgery: an underrecognized complication, *Minim. Invasive Surg.* (2012) 1–2.
- [15] M.P. Hocking, D.M. McCoy, S.B. Vogel, et al., Antiperistaltic and isoperistaltic intussusception associated with abnormal motility after roux-en-Y gastric bypass: a case report, *Surgery* 110 (1991) 109–112.
- [16] A.C. Wittgrove, G.W. Clark, Laparoscopic gastric bypass, roux-en-Y-500 patients: technique and results, with 3–60 month follow-up, *Obes. Surg.* 10 (2000) 233–239.
- [17] T.M. Duane, S. Wohlgemuth, K. Ruffin, Intussusception after roux-en-Y gastric bypass, *Am. Surg.* 66 (2000) 82–84.
- [18] G. Gayer, R. Zissin, S. Apter, et al., Pictorial review: adult intussusception—a CT diagnosis, *Br. J. Radiol.* 75 (2002) 185–190.
- [19] D.D. Coster, S.M. Sundberg, D.S. Kermod, et al., Small bowel obstruction due to antegrade and retrograde intussusception after gastric bypass: three case reports in two patients, literature review, and recommendations for diagnosis and treatment, *SurgObesRelatDis* 4 (2008) 69–72.
- [20] D. Stephenson, R.C. Moon, A.F. Teixeira, et al., Intussusception after roux-en-Y gastric bypass, *Surg. Obes. Relat. Dis.* 10 (2014) 666–670.

- [21] S.C. Simper, J.M. Erzinger, R.D. McKinlay, et al., Retrograde (reverse) jejunal intussusception might not be such a rare problem: a single group's experience of 23 cases, *Surg. Obes. Relat. Dis.* 4 (2008) 77–83.
- [22] H.P. Santry, D.L. Gillen, D.S. Lauderdale, Trends in bariatric surgical procedures, *JAMA* 294 (2005) 1909–1917.
- [23] S. Al-Sabah, N. Christou, Intussusception after laparoscopic roux-en-Y gastric bypass, *Surg. Obes. Relat. Dis.* 4 (2008) 205–209.
- [24] R.L. Nelson, L. Williams, T. Bombeck, A unique late mechanical complication of jejunoileal bypass, *Dis. Colon Rectum* 28 (1985) 738–740.
- [25] K. Chaiyasate, M. Solh, S. Silapasvang, V. Mittal, Intussusception after roux-en-Y gastrojejunostomy: sequela of the roux stasis syndrome? *Surg. Rounds* 29 (2006), 286–6.
- [26] J. Goverman, M. Greenwald, L. Gellman, D. Gadaleta, Antiperistaltic (retrograde) intussusception after roux-en-Y gastric bypass, *Am. Surg.* 70 (2004) 67–70.
- [27] M.S. Srikanth, T. Keskey, S.R. Fox, et al., Computed tomography in small bowel obstruction after open distal gastric bypass, *Obes. Surg.* 14 (2004) 811–822.
- [28] S. Carilli, M. Arisoy, A. Alper, A rare complication following laparoscopic roux-en-Y gastric bypass: intussusception-case report, *Springerplus* 4 (2015) 603.
- [29] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, A. Thoma, Z. The Mei, SCARE, Guideline: updating consensus surgical CAse REport (SCARE) guidelines, *Int. J. Surg.* 2020 (84) (2020) 226–230.