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A rare case of jejuno gastric intussusception: A case report and review of the literature

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ABSTRACT

INTRODUCTION: Jejuno gastric intussusception following gastrectomy or gastric bypass surgery is a rare complication that, if not identified early, can have catastrophic outcomes.

PRESENTATION OF CASE: In this case, a 59-year-old male with a previous Billroth II gastrojejunostomy presented with intussusception of the efferent loop of jejunum through his previous repair.

DISCUSSION: As there has only been approximately 300 reported cases of this complication, it often does not rank high as a differential diagnosis. Early detection of jejuno gastric intussusception by maintaining a high level of suspicion is critical in reducing morbidity and mortality associated with this complication. This can be achieved by following the appropriate steps to diagnosis and choosing the appropriate treatment modality.

CONCLUSION: Presentation of the case and a review of the literature is critical to make surgeons aware of this rare complication.

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1. Introduction

Jejuno gastric intussusception is a rare complication that can occur following previous gastrectomy or gastric bypass surgeries. The reported incidence of this complication is 0.1% [1]. It was first described in 1914 by Bozzi, 30 years after the first gastrojejunostomy was performed [2]. To date, only 300 cases of jejuno gastric intussusception have been reported worldwide [1]. We present a case of jejuno gastric intussusception through a previous Billroth II gastrojejunostomy. Early diagnosis and treatment are crucial for these presentations in order to prevent major complications such as bowel ischemia or death [3]. Contributing to the literature will further expand our knowledge about the various treatment modalities to prevent catastrophic complications. The case presented here was managed at a tertiary academic center and was reported in line with SCARE criteria [4].

2. Presentation of case

A 59-year-old male was brought in by ambulance from a rural health center to our tertiary care emergency department with a 2-day history of new onset, progressive abdominal pain, nausea,

vomiting and obstipation. He was tachycardic but otherwise vitally stable. Abdominal exam revealed mild distention and an obvious midline incisional hernia. He did not have any signs of peritonitis and the hernia was soft and reducible. Past surgical history was significant for a Billroth II gastrojejunostomy with tube duodenostomy for perforated peptic ulcer disease 2 years prior. His comorbidities included atrial fibrillation on apixaban, congestive heart failure, peripheral arterial disease and history of a pulmonary embolism. He is an ex-smoker and does not consume alcohol. Initial laboratory investigations revealed an elevated white blood cell count of $21 \times 10^9/L$, a normal CRP, and a venous lactate of 2. At this point the findings were concerning for an internal hernia, small bowel obstruction, recurrent peptic-ulcer disease, or bowel ischemia.

CT scan of the abdomen was performed revealing small bowel herniation through the gastrojejunostomy into the stomach. The report also commented on swirling of the mesentery and hyperenhancement of the involved bowel segment (Fig. 1). A nasogastric tube was inserted for gastric decompression and provided symptomatic relief. The patient remained hemodynamically stable and did not exhibit signs of bowel ischemia or peritonitis. Given the CT scan findings, the patient's clinical status, comorbidities, and the patient's initial refusal of surgery, a decision was made to treat him conservatively with IV antibiotics and serial abdominal examinations.

The following day, the white blood cell count increased to $24 \times 10^9/L$, yet the patient continued to be resistant to operative

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Fig. 1. Coronal CT abdomen image from initial presentation showing intussuscepted small bowel into the stomach (indicated with red arrow).

management given that his abdominal pain had not worsened. A review of the available literature yielded the possibility of endoscopic management in select cases [1,5–8]. A gastroscopy was then performed which confirmed the intussusception of a jejunal loop through the gastrojejunostomy (Fig. 2a & b). An attempt was made to reduce the intussuscepted jejunal loop using the gastroscope, however, this was unsuccessful.

At this time surgery was indicated and consent was obtained to proceed with an exploratory laparotomy. The procedure was carried out by a Canadian Royal College accredited, fellowship trained general surgeon and assisted by general surgery residents. Intraoperatively, a jejuno gastric intussusception of the efferent loop of jejunum was identified (Fig. 3). No lead point was identified. Additionally, an internal hernia through Petersen's defect was identified with no evidence of incarceration. The intussuscepted loop was carefully reduced, and no resection was performed as the bowel appeared viable. Petersen's defect was then closed primarily and the efferent jejunal limb was pexied to the mesocolon. The decision was made to perform a manual reduction and fixation of the intussuscepted jejunal limb rather than revision of the anastomosis because of the patient's multiple comorbidities and overall fitness

for surgery. The patient recovered fully and uneventfully. He has since been seen in follow-up and has been doing well and has no concerns.

3. Discussion

Postoperative jejuno gastric intussusception is a rare complication after gastric surgeries. It is classified into 4 types (Fig. 4): Type 1- afferent loop intussusception, Type 2- efferent loop intussusception, Type 3- combined afferent and efferent loop intussusception, and Type 4- intussusception through side-to-side jejunal anastomosis (Braun). Type 2 is the most common form, accounting for 76.5% of cases [9,10]. The etiology is thought to be functional and related to factors such as a long afferent limb, wide anastomosis and retrograde peristalsis, however, the exact mechanism remains undetermined [9]. In patients presenting with intussusception with no prior repair, the most common cause is a lead point secondary to a malignant lesion (30% in small bowel and 66% in large bowel), although idiopathic intussusception occurs in 16 and 5 percent of small and large bowel cases, respectively. Despite a lead-point being the cause in the majority of cases, it has not been identified

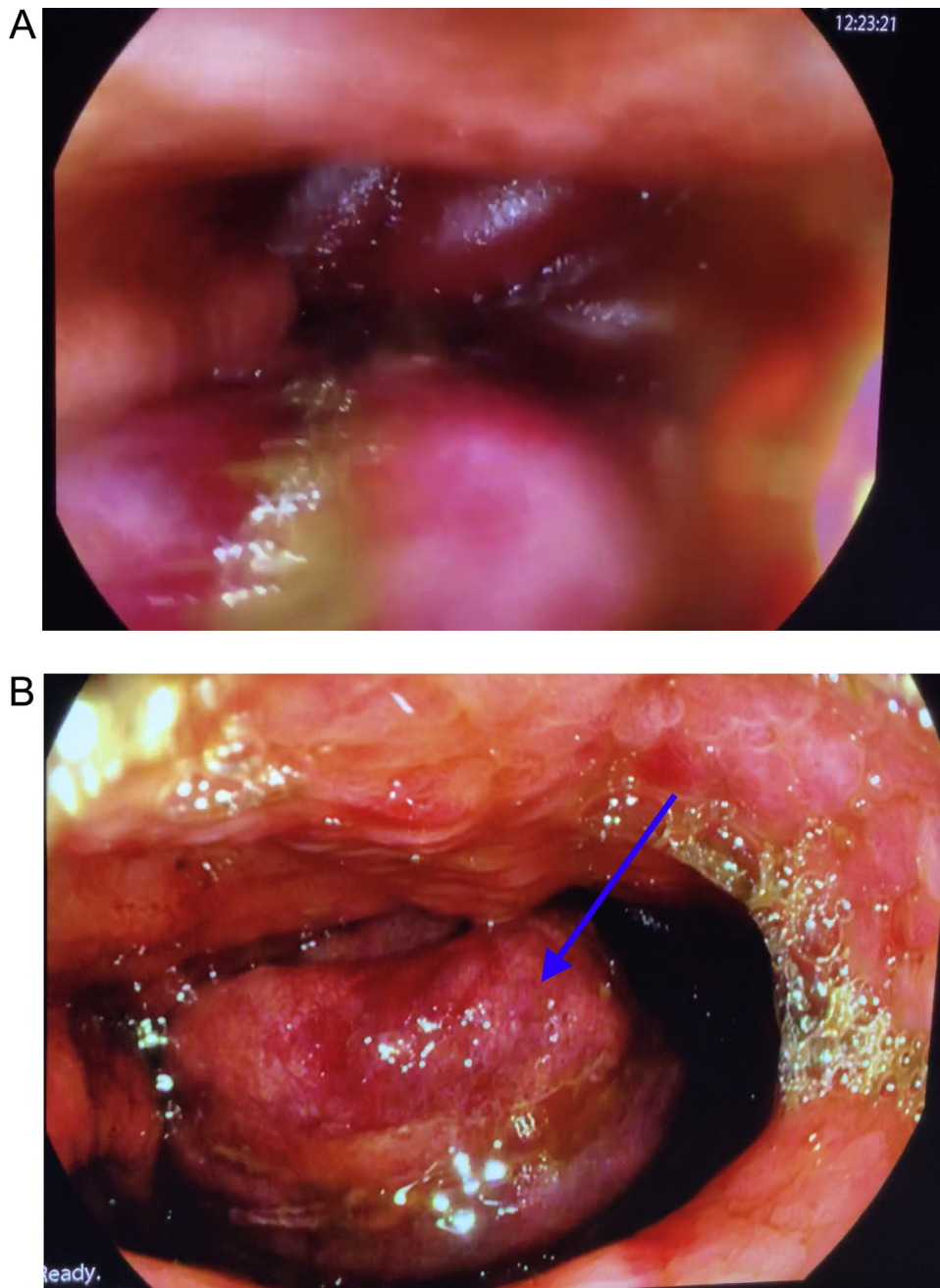


Fig. 2. a) Endoscopic video showing intussusception of a jejunal loop through the gastrojejunostomy. b) A still image captured from the endoscopic video demonstrating the intussusception visualized on gastroscopy. The efferent loop of jejunum within the stomach is indicated with the blue arrow.

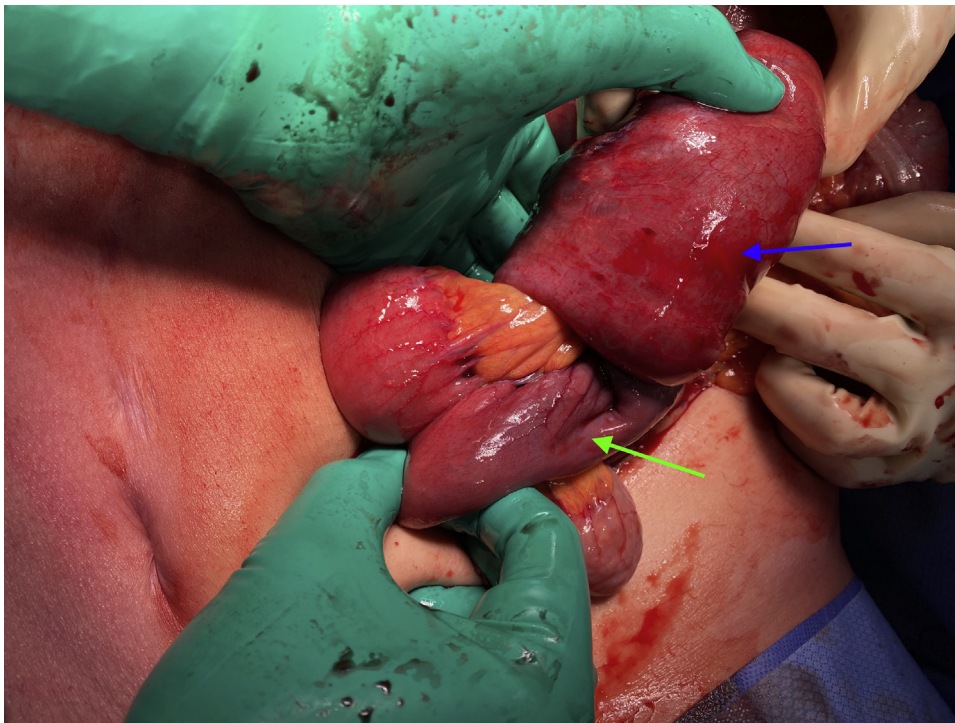


Fig. 3. Intraoperative photograph showing jejunogastric intussusception of the efferent loop of jejunum. The stomach is labeled with a blue arrow and the intussuscepted loop of jejunum is indicated with a green arrow.

as a cause of jejunogastric intussusception following gastrojejunostomy [11,6].

Early diagnosis is critical as mortality rates increase from 10% when an intervention occurs within 48 h, to 50% if treatment is delayed for 96 h [3]. Presentation can vary depending on the acuity as well as bowel integrity. Nausea and vomiting are common presenting symptoms. The classic triad of epigastric pain, hematemesis and a palpable, tender epigastric mass is defined in the literature [12]. The gold standard for diagnosis is endoscopy as it allows for assessment of bowel viability. Ultrasound and CT have improved the rate of diagnosis and are readily available in most centers, however, most cases are still diagnosed with direct visualization, whether it be endoscopically or intraoperatively [1,12].

Treatment modalities for jejunogastric intussusception include both endoscopic and surgical interventions, with endoscopic reduction having higher recurrence rates [5,8]. The decision to attempt endoscopic reduction in our case was multifactorial, based on the patient's hesitance to proceed with surgical management, hemodynamic stability, CT scan findings and available evidence [5–8]. The more well-known cause for intussusception remains a lead point [11], which poses the question as to whether endoscopy should be reserved for diagnostic purposes only, as it does not allow for a full examination of the reduced limb of bowel and the fact that recurrence rates are higher [6,9]. Nevertheless, endoscopic reduction was unsuccessful in our case and it should be avoided in cases where the bowel is compromised, or the patient shows signs of peritonitis [5,6].

Surgery remains the treatment of choice and a variety of surgical procedures can be performed depending on intraoperative findings. Operative approaches may include manual reduction of the intussuscepted loops(s) with fixation of the jejunal limb, resection and revision of anastomosis or creation of a Roux-en-Y bypass depending on bowel viability [5]. There is limited data on recurrence rates between the different surgical approaches given the rarity of this complication [14]. Operative management should be decided on a case-by-case basis and will depend on both intraoperative findings and the patient's overall health status. Further research will need to be conducted to compare various operative strategies and future recurrences to determine the optimal intervention.

4. Conclusion

This is a rare case of jejunogastric intussusception 2 years following a Billroth II gastrojejunostomy. Our hope is to add to the available literature to aid physicians in their diagnostic work-up and in developing management plans for similar cases that present in the future. Although jejunogastric intussusception is rare, immediate treatment is critical to avoid catastrophic outcomes, and therefore, a high index of suspicion is required for early diagnosis.

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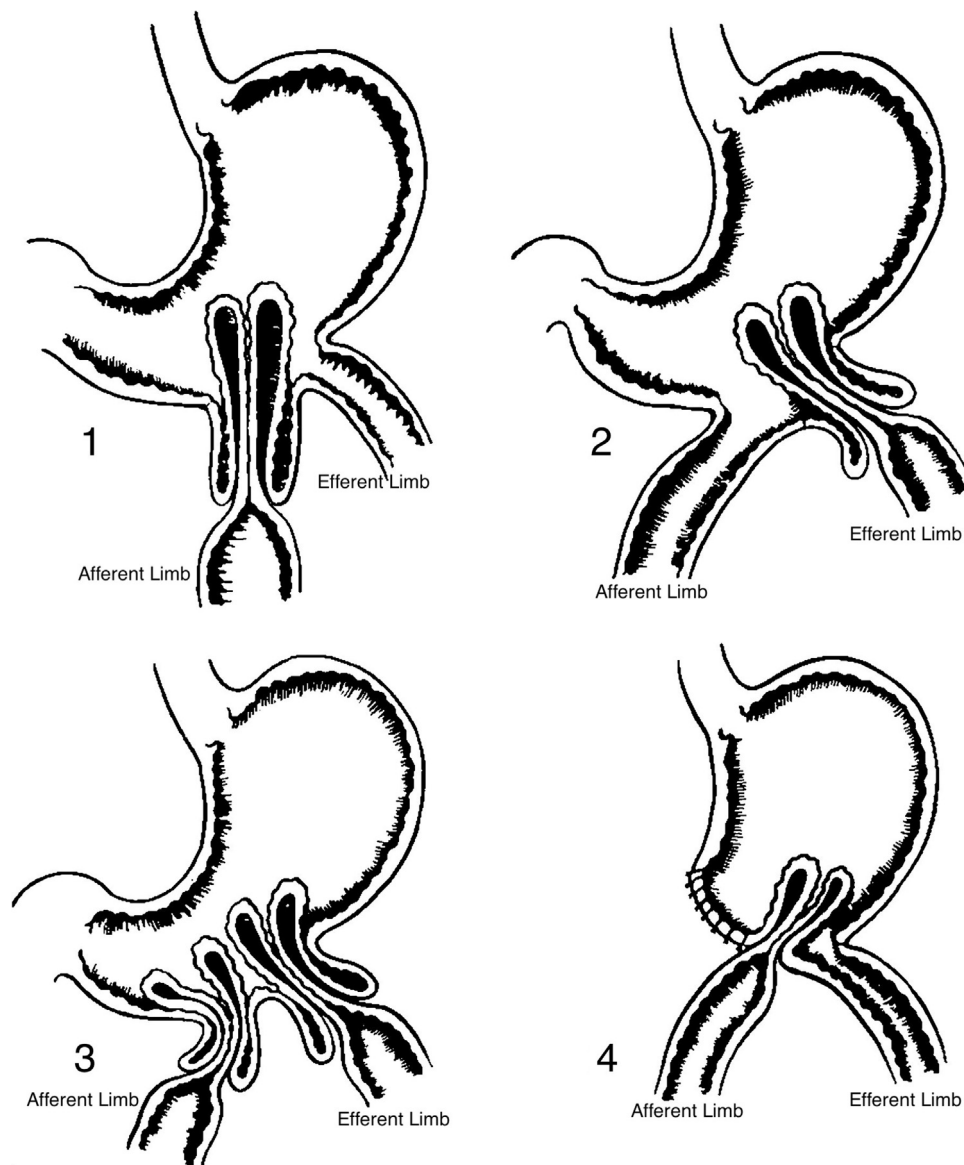


Fig. 4. Diagram illustrating the 4 different types of gastrojejunal intussusception following Billroth II reconstruction [13].

Ethical approval

Ethical approval was not required for this case report.

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.

Author contribution

Dr. Nawaf Abu-Omar, MD conceived, designed and drafted the article, with additional contributions to acquisition of data and critical revision.

Dr. Megan Spafford, MD contributed to design, critical revision of the manuscript and acquisition/interpretation of data.

Dr. Pieter Seshadri, MD contributed to conception of the work and contributed to critical revision of the manuscript for intellectual content.

All authors listed above gave final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Contributors = Dr. Moayad Alturkistani, MD who was involved in patient-care and conception of the article.

Registration of research studies

Not applicable.

Guarantor

All of the authors (Nawaf Abu-Omar, Megan Spafford, Pieter Seshadri) act as guarantors for the report and accept responsibility for the work. Each author had access to the data and controlled the decision to publish.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.ijscr.2021.105862>.

Declaration of Competing Interest

The authors report no declarations of interest.

References

- [1] F.A. Herbella, J.C. Del Grande, *Radiology for the surgeon. Soft-tissue case 53. Postgastrectomy jejuno gastric intussusception*, *Can. J. Surg.* 46 (November (6)) (2003) 465–466.
- [2] E. Bozzi, *Annotation*, *Bull. Acad. Med.* [Internet] 122 (1914) 3–4.
- [3] P.M. Walstad, J.A. Ritter, V. Arroz, *Delayed jejuno gastric intussusception after gastric surgery: an ever-present threat*, *Am. Surg.* [Internet] 38 (March (3)) (1972) 172–175.
- [4] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, for the SCARE Group, *The SCARE 2020 guideline: updating consensus Surgical Case Report (SCARE) guidelines*, *Int. J. Surg.* 84 (2020) 226–230.
- [5] C.M. Loi, S.Y. Huang, Y.D. Chen, S.D. Chen, J.M. Wu, K.H. Chen, *Retrograde jejuno gastric intussusception: a case report and review of the literature*, *Asian J. Surg.* [Internet] 40 (June (4)) (2014) 309–312, <http://dx.doi.org/10.1016/j.asjsur.2014.04.001>.
- [6] S. Guadagni, M. Pistoia, M. Catarci, F. Carboni, L. Lombardi, M. Carboni, *Retrograde jejuno gastric intussusception: is endoscopic or surgical management more appropriate?* *Surg. Today* [Internet] 22 (1992) 269–272, <http://dx.doi.org/10.1007/BF00308834>.
- [7] E. Toth, S. Arvidsson, H. Thorlaciuss, *Endoscopic reduction of a jejuno gastric intussusception*, *Endoscopy* [Internet] 43 (2) (2011) 63, <http://dx.doi.org/10.1055/s-0030-1256103>.
- [8] Y.X. Lyu, Y.M. Xu, *Jejuno gastric intussusception after Whipple procedure with B-II reconstruction: a case report*, *BMC Gastroenterol.* [Internet] 20 (1) (2020) 101, <http://dx.doi.org/10.1186/s12876-020-01259-2>.
- [9] S. Brynitz, E. Rubinstein, *Hematemesis caused by jejuno gastric intussusception*, *Endoscopy* [Internet] 18 (July (4)) (1986) 162–164, <http://dx.doi.org/10.1055/s-2007-1018361>.
- [10] H.S. Irons, R.J. Lipin, *Jejuno-gastric intussusception following gastroenterostomy and vagotomy*, *Ann. Surg.* [Internet] 141 (April (4)) (1955) 541–546, <http://dx.doi.org/10.1097/00000658-195504000-00017>.
- [11] T. Lu, Y.M. Chng, *Adult intussusception*, *Perm J.* [Internet] 19 (1) (2015) 79–81, <http://dx.doi.org/10.7812/TPP/14-125>.
- [12] H. Tokue, Y. Tsushima, Y. Arai, K. Endo, *Jejuno gastric intussusception: life-threatening complication occurring 55 years after gastrojejunostomy*, *Intern. Med.* [Internet] 48 (18) (2009) 1657–1660, <http://dx.doi.org/10.2169/internalmedicine.48.2115>.
- [13] W.S. Caudell, M.C. Lee, *Acute and chronic jejuno gastric intussusception*, *N. Engl. J. Med.* [Internet] 253 (1955) 635–640, <http://dx.doi.org/10.1056/NEJM195510132531503>.
- [14] A.J. Archimandritis, N. Hatzopoulos, P. Hatzinikolaou, S. Sougioultzis, D. Kourtesas, G. Papastratis, M. Tzivras, *Jejuno gastric intussusception presented with hematemesis: a case presentation and review of the literature*, *BMC Gastroenterol.* [Internet] 1 (2001) 1, <http://dx.doi.org/10.1186/1471-230x-1-1>.

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