

Inadvertent Gastroileostomy After Obstructing Pyloric Ulcer

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Background	A male patient presented after multiple incorrect diagnoses with the finding of an inadvertent gastro-ileostomy.
Summary	A 72-year-old male presented one year after a presumed gastrojejunostomy for gastric outlet obstruction from a pyloric ulcer. He endured a year of progressive weight loss and diarrhea through multiple hospital admissions before an inadvertent gastroileostomy was diagnosed. He underwent takedown of the gastro-ileostomy and creation of gastrojejunostomy. Due to new-onset postoperative gastroparesis and continued bile reflux, in the setting of a prior vocal cord injury that precluded safe swallowing, this was converted to Roux-en-Y reconstruction, after which he improved. A brief review of the literature follows, discussing recognition and potential causes for this unusual complication.
Conclusion	Inadvertent gastro-ileostomy is a rare albeit potential complication after gastric surgery that contemporary surgical trainees should understand and recognize.
Key Words	gastrojejunostomy; gastro-ileostomy; pyloric ulcer; gastric outlet obstruction

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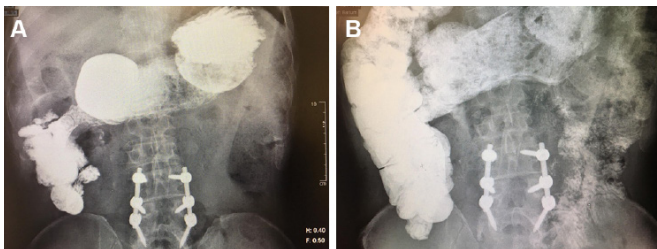
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Case Description

A 72-year-old male presented with one year of weight loss, diarrhea, and malnutrition after a simple gastric-small bowel side-to-side anastomosis without resection for an obstructing pyloric ulcer. His additional history included coronary artery disease with stent placement, oropharyngeal dysphagia secondary to a vocal cord injury from prior intubation, chronic back pain on narcotics, and lumbar fusion. During the year after the index operation, he sought advice at multiple academic medical centers in the United States for investigation without a satisfying diagnosis. Examination revealed a cachectic, emaciated, Caucasian male with a soft scaphoid abdomen with a well-healed midline scar. Initial imaging included an upper gastrointestinal contrast study with small bowel follow-through, revealing a patent anastomosis and contrast entering the colon within 15 minutes (Figure 1).

Figure 1. Upper Gastrointestinal Contrast Study with Small Bowel Follow-Through. Published with Permission



A) Upper gastrointestinal contrast study with small bowel follow-through examination demonstrating no evidence for obstruction at the site of anastomosis; contrast had already reached colon within 15 minutes; B) at sixty minutes, nearly all contrast is present in colon—note: normal gastric emptying function preoperatively

Though the diagnosis was theorized clinically, the colonic transit time on contrast study further suggested a direct gastric-ileal connection. He was taken for exploratory laparotomy, takedown of gastro-ileostomy, and redo gastrojejunostomy with ileal reanastomosis. The upper midline incision was small, suggesting inadequate exposure to the anatomy. A gastro-ileostomy was indeed encountered 30 cm proximal to the ileocecal valve. At the time of operation, a redo gastrojejunostomy was elected to be performed rather than a Roux-en-Y reconstruction, because of two suture lines versus three, in this severely malnourished patient.

The patient developed bilious emesis postoperatively due to gastroparesis of an unclear etiology, requiring intermittent nasogastric decompression. Contrast studies were negative for leak or obstruction. A gastrojejunostomy tube was placed for gastric drainage and distal feeding; there was initial difficulty tolerating jejunal feeds. Further contrast studies showed contrast passing through the entire bowel, with retrograde reflux into the stomach, even when administered through the jejunal port.

Figure 2. Contrast study via jejunal port revealing reflux of contrast into stomach. Published with Permission



As noted previously, the patient had oropharyngeal dysphagia due to unilateral vocal cord paralysis from a suspected prior iatrogenic intubation injury. Because of the persistent biliary reflux combined with inadvertent aspiration risk, we undertook expeditious correction. The patient was taken back for the creation of a Roux-en-Y gastrojejunostomy for reflux prevention. The proximal limb was anastomosed 45 cm distal to the gastro-jejunostomy to the jejunum.

Postoperatively, the patient's tube feeds were titrated to the goal. Parenteral nutrition was discontinued, and he tolerated thick liquids on discharge with continued jejunal enteral feeding given his aspiration risk. After three months, his paralysis recovered with Teflon injections. His gastrojejunostomy tube was removed, and after being transitioned completely to oral feeding, he gained 15 kg, with a marked improvement in energy, mood, and affect.

Discussion

The creation of inadvertent gastro-ileostomy is rare, and there is a paucity of cases in the literature. In 1949, William Moretz¹ of the University of Utah reviewed the first 27 cases known in the literature, with the first case being initially published in 1915. After this, subsequent case series were published in surgical journals globally: Portugal 1955,² Italy 1958,³ Brazil 1963,⁴ Spain 1963,⁵ Japan 1971,⁶ *Gastroenterology* in 1963,⁷ and again in the *Annals* in 1968.⁸

Moretz noted that an “interesting and constant feature about the reported instances of gastro-ileostomy is that the original operation was performed by some surgeon other than the one reporting the case.”¹ There does not appear to be a published case in the last thirty years. Though the “heyday” of gastric surgery for ulcer operations is dwindling, we believe surgical trainees should be made aware of this complication. The fact that the patient sought aftercare without a correct diagnosis and treatment plan at multiple revered tertiary and quaternary centers is indicative of a knowledge gap worth writing about and an opportunity for improvement. Thus, our motivation for publishing is similar to that of Moretz in 1949: “It is felt that the occurrence of a gastro-ileostomy following gastric resection is sufficiently rare to justify another report.”¹

This elegant paper discusses the embryological development of the small bowel and proposes how malrotation leads to the error. Twenty-two of the 24 cases utilized in Moretz’s analysis were for peptic ulcer disease. In only two were partial gastrectomies performed. None of these patients had feeding jejunostomies placed before reconstruction, but some received them after.

Throughout its recognition, the symptoms of this complication tended to include abdominal pain, diarrhea, and weight loss; vomiting was less frequent. The symptoms were expectedly more severe when accompanied by gastric resection and complete pyloric exclusion, which was not the case in our patient. A Lahey Clinic case series notes: “Many cases were reported during the heyday of gastroenterostomy, but the complication was not a serious one with the short circuit procedure as some of the gastric contents continued to go through the pylorus.”⁹

There are several potential sources of error contributing to an inadvertent gastro-ileostomy. They include inadequate exposure, which seemed to be the reason in this case; malrotation of the midgut, which can cause the surgeon to mistake jejunum for ileum; absence of the Ligament of Treitz, and severe adhesive disease. An ill-placed adhesion can be mistaken for the ligament of Treitz. One should identify the ligament by its proximity to the inferior mesenteric vein as nothing else is consistently reliable. Prevention requires positive identification of the bowel via the landmarks above. One cannot anastomose with impunity without this assurance: “Although a loop of bowel in the left upper quadrant beneath the transverse mesocolon will usually be jejunum, it must be identified with certainty before it is used in a gastroenterostomy.”¹

A limitation of this case report is the unclear reason for the development of acute gastroparesis in a patient who did not have pre-existing diabetes or gastric dysmotility. We stand by our decision to perform a “simple” gastrojejunostomy first, before creating a Roux-en-Y, to limit the creation of a Roux-en-Y, to limit the amount number of suture lines and potential for failure in this malnourished patient. Whether this is a sequela related to the structural change itself would be a potential area for future investigation. For training program purposes, this topic is most related to the ACGME Competency of Performance of Operations and Procedures recognition of postoperative complications.

Conclusion

This patient was seen at multiple reputable academic centers before the correct diagnosis of inadvertent gastro-ileostomy was reached, highlighting a need for refamiliarization of this rare surgical complication. Current surgical trainees should know about the possibility of this error after gastric outlet obstruction surgery.

Lessons Learned

Inadvertent gastro-ileostomy is a rare albeit potential complication after gastric surgery, manifested by diarrhea and malnutrition and supported by short colonic transit time. Several best practices can be employed to ensure correct identification of the small bowel when creating an anastomosis between the stomach and the jejunum.

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