

Case Report

Development of a gastrocutaneous fistula from a marginal ulcer after repair of duodenal injury with pyloric exclusion

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ABSTRACT

Introduction: Duodenal trauma is rare but can be associated with significant morbidity and mortality (Pandey et al., 2011). Adjunct procedures, such as pyloric exclusion, can be performed to assist in surgical repair of these injuries. However, pyloric exclusion can lead to severe long-term complications associated with significant morbidity that can be difficult to repair.

Case: A 35-year-old man with a history of duodenal trauma from a gunshot wound (GSW) status post pyloric exclusion and Roux-en-Y gastrojejunostomy presented to the Emergency Department (ED) with complaints of abdominal pain and leakage of food particles and fluid from an open wound around his surgical scar. Computed tomography (CT) scan on admission showed a tract extending from the gastrojejunostomy anastomosis to the skin representing a fistula. Esophago-gastro-duodenoscopy (EGD) reconfirmed a large marginal ulcer that had fistulized to the skin. After nutritional repletion, the patient was taken to the operating room (OR) for takedown of the enterocutaneous fistula and Roux-en-Y gastrojejunostomy, closure of gastrotomy and enterotomy, pyloroplasty and feeding jejunostomy tube placement. The patient was re-admitted after discharge with abdominal pain, vomiting and early satiety. EGD showed gastric outlet obstruction and severe pyloric stenosis which was managed with endoscopic balloon dilation.

Conclusion: This case represents the severe and potentially life-threatening complications that may occur after pyloric exclusion with Roux-en-Y gastrojejunostomy. Gastrojejunostomies are prone to marginal ulceration which can perforate if not adequately treated. Free perforations cause peritonitis, but if the perforation is contained it can erode through the abdominal wall creating the rare complication of a gastrocutaneous fistula. Even after restoration of normal anatomy with a pyloroplasty, patients may suffer additional complications such as pyloric stenosis requiring continued intervention.

Case

The patient is a 35-year-old man with a history of duodenal trauma from a GSW who was initially managed with a primary duodenal repair. He developed a leak post operatively and was taken back to the OR where he was found to have extensive

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inflammation of the duodenum that could not be repaired while maintaining continuity with the stomach. We decided to perform a pyloric exclusion with drainage of the proximal stomach. This eventually required a Roux-en-Y gastrojejunostomy due to failure of the pylorus to reopen.

In the years after his initial procedure, the patient was diagnosed with a large marginal ulcer and abdominal wall abscess but was never treated definitively. Social history was significant for a 20-pack year smoking history but no alcohol or recreational drug use.

He eventually presented to our facility with a 2-day history of abdominal pain and leakage of food particles from an open wound around his old surgical scar. Labs were significant for a white blood cell count (WBC) of 5.5, hemoglobin of 7.4 and albumin of 2.8. His midline abdominal surgical scar was indurated and tender to palpation with a circular wound in the left upper quadrant (LUQ) draining serosanguinous fluid without purulence, as seen in Fig. 2. CT scan showed a tract extending from the prior gastrojejunostomy to the skin, representing a fistula, depicted in Fig. 1.

Upper endoscopy showed a gastrocuteaneous fistula in communication with an 8 cm × 4 cm ulcer at the gastrojejunostomy. This was not amenable to endoscopic suturing or closure given its size. *H. pylori* IgA was positive. The patient was started on TPN and his nutritional status improved.

On hospital day 10, the prior Roux-en-Y gastrojejunostomy was resected. The stomach was found to end blindly at the pylorus, but the adjacent duodenal stump was patent. A Heineke-Mikulicz pyloroplasty was performed and the old gastrostomy site was closed. A jejunostomy feeding tube was placed. Chronically inflamed skin was resected from the site of the fistula and the skin was approximated.

The patient's postoperative course was uncomplicated. Upper gastrointestinal (GI) series done on post-operative day (POD)#5 showed no evidence of a leak. The patient was advanced to a regular diet and was discharged home on POD#10 with a referral for home health care and plans to follow up in 1 week.

Unfortunately, the patient presented three weeks later with a two-day history of abdominal pain, non-bloody non-bilious vomiting, early satiety and leakage of fluid from an open wound in the LUQ. CT demonstrated diffuse edema throughout the subcutaneous and mesenteric tissues and a persistent skin defect in the left anterior abdominal wall. Gastroenterology (GI) was consulted and there was concern for recurrent ulcer or gastric outlet obstruction. Repeat upper endoscopy showed a 2 cm hiatal hernia, Los Angeles grade A esophagitis, severe pyloric stenosis that could not be traversed, and food residue in the stomach. Upper GI study showed a pyloric stricture with markedly delayed gastric emptying. The patient was getting J-tube feeds and tolerating only a clear liquid diet before he left AMA prior to undergoing endoscopic management of his pyloric stricture with GI. He followed up with GI two weeks later and was transfused and re-nourished before eventually undergoing balloon dilation.

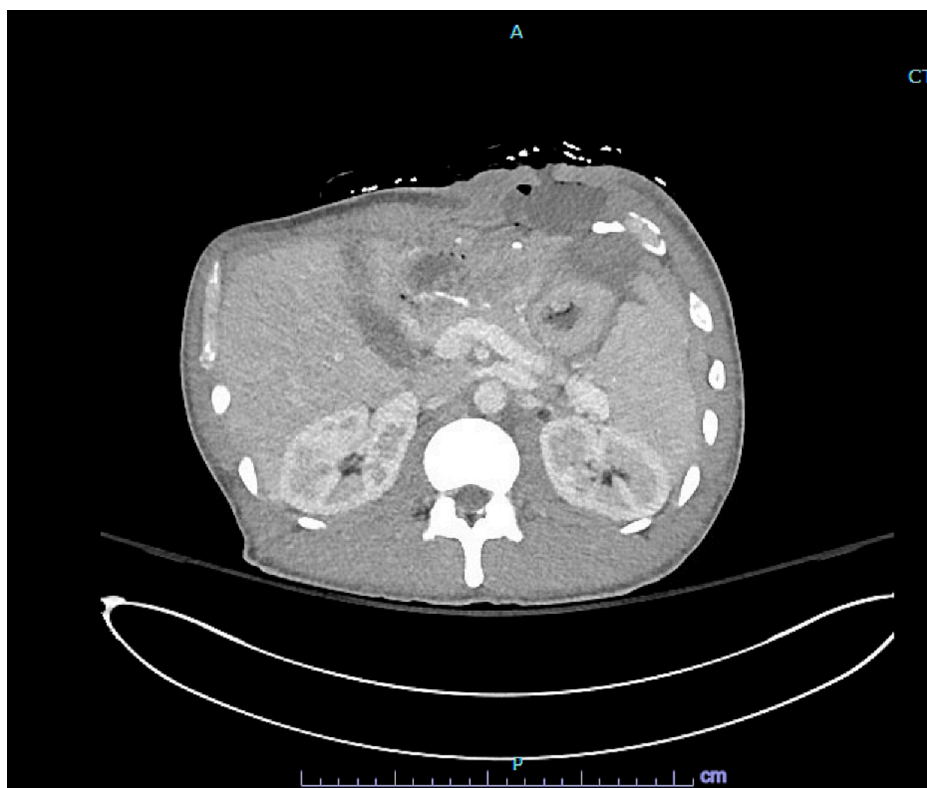


Fig. 1. CT scan GC fistula.



Fig. 2. Physical exam GC fistula.

Discussion

Duodenal injury after trauma is rare, difficult to diagnose and managed with a variety of different surgical techniques based on each patient's unique presentation [1]. Pyloric exclusions can be performed to temporarily protect the duodenum from gastric secretions as injuries heal with the pylorus eventually re-opening over time [2]. Early studies showed decreased incidence of post-operative leak after pyloric exclusion compared to primary repair alone and low incidence of marginal ulcer and duodenal fistula formation [3]. However, the benefit of pyloric exclusion for duodenal injuries has been questioned after recent studies have shown no improvement in clinical outcomes or mortality and trends towards increased complication rate and length of hospital stay [2,4].

Unfortunately, our patient's pylorus failed to open despite multiple interventions via upper endoscopy. This may have been related to stricture formation and the patient's risk factors for ulceration. As a result, the patient required creation of a gastrojejunostomy so he would not be feeding tube dependent. However, gastrojejunal anastomoses are inherently ulcerogenic due to exposure of intestinal mucosa to gastric acid unopposed by pancreatic secretions. Marginal ulcers occur in up to 16 % of patients after Roux-en-Y gastrojejunostomy and may be associated with significant morbidity [5]. In addition, our patient had additional risk factors, including *H. pylori* colonization, smoking, malnutrition, and non-compliance with follow up which all contributed to development of a marginal ulcer and subsequent fistula.

Gastrocutaneous fistulas are uncommon and occur in 0.5–3.9 % of patients after gastric surgery [6]. Etiologies include breakdown of an enteric anastomosis and chronic inflammation, both of which were likely present in the patient described in this case. If left untreated, gastrocutaneous fistulas may lead to sepsis and even death [7]. Our patient had been diagnosed with both a marginal ulcer and abdominal abscess in the years prior to his presentation, so it is difficult to determine how long his gastrocutaneous fistula had been present prior to seeking treatment at our facility. Regardless, these complications in conjunction caused significant morbidity, and the patient suffered from debilitating symptoms, including weight loss, chronic abdominal pain, malnutrition requiring feeding tube placement and chronic anemia requiring repeat transfusions.

Even after reversal of the prior procedure and re-establishing gastro-duodenal continuity with a pyloroplasty, the patient suffered additional complications. He developed symptomatic gastric outlet obstruction from severe pyloric exclusion. The pyloroplasty was widely patent at the time of the operation but may have developed a stricture postoperatively due to the patient's known risk factors for ulceration. We felt that restoring the patient's normal anatomy would be sufficient to allow healing, but we could have considered a vagotomy to definitively manage his ulcer disease. Prior studies have shown that truncal vagotomy performed for non-healing marginal ulcers after Roux-en-Y gastrojejunostomy improves symptoms and can have equivalent outcomes to gastrojejunostomy revision procedures, although these studies are limited by sample size [8,9]. Given the patient's failure with medical treatment, a vagotomy may have helped prevent stricture formation at the pylorus.

Ultimately, one of the main factors that contributed to the poor outcomes in this case was the lack of follow up. Patients who undergo pyloric exclusion require close follow up given the well described potential complications that can occur postoperatively. They should be medically managed with proton pump inhibitors and undergo routine endoscopic surveillance. With routine follow-up, our patient's marginal ulcer and *H. pylori* might have been treated before it became severe enough to fistulize to the skin.

In conclusion, pyloric exclusion for duodenal injury may be unavoidable in patients who have failed primary repair. However, these

patients must be followed closely postoperatively and undergo routine surveillance for prevention of severe complications that can cause morbidity and mortality. If the proximal stomach is drained at the initial procedure, clinicians should be aware that the pylorus may fail to re-open and creation of a gastrojejunostomy may be required. This procedure is associated with development of marginal ulcers which may cause significant morbidity if left undiagnosed and untreated. Reversal of the procedure should be considered if the patient is symptomatic. Definitive treatment for ulcerative disease should be considered in patients who are refractory to medical treatment and who have additional risk factors to prevent strictures and ulcerations.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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