Difficulties in diagnosing an intermittent mesenteroaxial gastric volvulus

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INTRODUCTION
Gastric volvulus is a rare condition that comes in two subsets: organoaxial and the less frequent mesenteroaxial volvulus (29%) [1]. An organoaxial volvulus rotates around the long axis of the stomach that bisects from the gastroesophageal junction and the pylorus of the stomach. On the other hand, a mesenteroaxial volvulus rotates around the short axis of the stomach [1, 2]. Gastric volvulus most frequently occurs secondary to diaphragmatic defects, but occasionally present even in the absence of predisposing anatomic abnormalities [3]. Acute cases of gastric volvulus typically present with the Borchardt triad of epigastric pain, retching without emesis and inability to pass a nasogastric tube [4]. Chronic cases may have an intermittent presentation of upper abdominal distension, gastroesophageal reflux or intermittent dysphagia [1]. Imaging is imperative in the diagnosis of an intermittently presenting volvulus due to the vague symptoms that patients experience. This can present a diagnostic dilemma as conclusive findings in imaging are only present during symptomatic periods and due to the intermittent nature of the disorder, a volvulus may spontaneously resolve before imaging studies are performed.

CASE REPORT
A 22-year-old male presents to the emergency department with several hours of abdominal pain, nausea and vomiting without blood. He has a 2-year history of having episodes of similar symptoms. Over the 2-year span, the patient has had a multitude of workups that included esophagogastroduodenoscopies (EGDs), abdominal X-rays, upper gastrointestinal (GI) contrast studies, computed tomography (CT) scans and magnetic resonance imagings of the brain and abdomen. All of these imaging studies were negative for significant pathology. Additionally, a psychiatrist was consulted but did not provide any additional insight. The patient’s vital signs on presentation were stable. Physical examination revealed a thin appearing, well-developed male with no acute distress. Examination of the abdomen revealed a scaphoid abdomen with epigastric tenderness upon palpation. The remainder of his physical examination was within normal limits. The patient had a prior appendectomy.

The laboratory results of the patient were creatinine 1.10 mg/dl (0.60–1.00), serum glucose 124 mg/dl (65–100), hemoglobin 16.9 µl (12.0–16.0) and total bilirubin 1.6 mg/dl (0.2–1.0). A gastroenterologist was consulted and an urgent EGD was done, showing negative insufflations of the stomach that were characteristic of a volvulus. The diagnosis of mesenteroaxial volvulus was confirmed by single contrast upper GI (UGI) imaging (Fig. 1).

The patient underwent a laparoscopic gastrostomy-tube gastroscopy. A 10 mm laparoscope and three 5 mm ports were placed. There was no evidence of a hiatal hernia, diaphragmatic hernia or Meckel’s diverticulum on visualization. The...
A crease on the stomach was visible where the volvulus had occurred. A 24-French gastrostomy tube was inserted percutaneously into the stomach and inflated. Using the gastrostomy tube, the stomach was approximated to the posterior aspect of the anterior abdominal wall. A point along the greater curve of the stomach, distal to the volvulus, was chosen to suture the stomach to the abdominal wall with permanent sutures. The patient tolerated the surgical procedure well (Fig. 2) and was discharged 4 days later.

DISCUSSION

Volvulus can have either an acute or chronic presentation. An acute gastric volvulus is a true medical emergency as it can lead to ischemia, necrosis and perforation carrying a mortality rate as high as 30–50% [1, 2]. A chronic, intermittent volvulus is difficult to diagnose because patients can present with a wide range of symptoms and severity. The volvulus can be asymptomatic and found incidentally [2]. A symptomatic, chronic gastric volvulus presents with vague symptoms that spontaneously resolve and may include upper abdominal distension, early satiety, water brash, gastroesophageal reflux or intermittent dysphagia [1]. These intermittent symptoms are often confused with peptic ulcer disease or cholecystitis [2]. Diagnosis is often delayed by the nature of the intermittent pathology, whereby the imaging studies are only abnormal during symptomatic periods.

Diaphragmatic defects are the main risk factor of a gastric volvulus. Gastric ligament laxity can predispose a patient to excessive rotation of the stomach and intra-abdominal adhesions can act as a hinge for the stomach to rotate around and form a volvulus [2, 5]. Other risk factors include patients aged over 50-years, asplenism, small and large bowel malformations, pyloric stenosis, colonic distention, rectal atresia, gastric tumor and splenic or left hepatic lobe agenesis [3, 4].

Diagnosis is made with clinical suspicion and imaging. X-ray, EGD, CT scan and upper GI contrast study all can be used to visualize a volvulus. An X-ray often shows a retrocardiac air bubble or an expanded air fluid level in the chest, while an upper GI contrast study may reveal an ‘upside-down’ stomach where the pylorus is positioned above the fundus [1, 4, 5]. The preferred treatment for gastric volvulus is repair of the paraesophageal hernia with fundoplication with or without gastropexy. In the absence of diaphragmatic pathology, the preferred treatment is anterior gastropexy whereby the stomach is sutured to the anterior abdominal wall. A tube gastrostomy can be used to further secure the stomach. The procedure can be done either open or laparoscopically. In severe cases where ischemic injury has caused necrosis, gastrectomy may be required [2].

This case report illustrates the obstacles in diagnosing an intermittent mesenteroaxial volvulus. It is important for physicians to maintain a high clinical suspicion for an intermittent volvulus as the presentation is often vague and subsequent imaging is frequently negative. This case also illustrates the importance of prompt imaging. Multiple
modalities of imaging that were done on our patient to diagnose the mesenteroaxial volvulus were negative because the volvulus had resolved by the time the imaging studies were conducted. In addition, this patient did not possess any risk factors to indicate a gastric volvulus which made the diagnoses even more difficult. When the diagnosis was confirmed in our patient, prompt surgical treatment was performed to correct the anatomy, prevent potential complications of obstruction and ischemia of the stomach, and relieve the patient of any future discomforts caused by his gastric volvulus.

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