Journal of Surgery and Surgical Case Reports

ISSN: 2694-4944

Case Report

A Suicidal Attempt Leading to a Rare Diagnosis: A Case Report of Superior Mesenteric Artery Syndrome Discovered after Corrosive Ingestion

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Abstract

Introduction: Superior Mesenteric Artery Syndrome (SMAS) is a rare entity. It occurs when the third part of the duodenum is compressed between the bifurcation of the aorta and the superior mesenteric artery which may lead to gastric outlet obstruction.

Case presentation: A 19-year old female, who has been admitted to our hospital due to corrosive ingestion as a suicidal attempt. She presented with generalized abdominal pain and coffee ground vomitus. Consequently, severe pyloric stenosis developed which led to gastric outlet obstruction. Failure of medical treatment necessitates surgical management in the form of laparoscopic gastrojejunostomy. Postoperative abdominal CT scan with IV contrast revealed a radiological finding suggestive of superior mesenteric artery syndrome.

Conclusion: SMAS is a rare condition on its own, and having an accompanying disease is even rarer. Although few cases have been reported, but still there are no set guidelines. Gastric outlet obstruction and duodenal obstruction do not commonly present together. Recommended surgical management regarding such cases is still not established. Gastrojejunostomy is a valid and safe approach that may be used in such conditions.

Keywords: Superior mesenteric artery syndrome; Wilkie's syndrome; Pyloric stenosis; Gastric outlet obstruction; Corrosive gastritis; Laparoscopic gastrojejunostomy

Abbreviations & Acronyms

SMAS: Superior Mesenteric Artery Syndrome; GOO: Gastric Outlet Obstruction; EGD: Esophagogastrodudenoscopy; CT: Computed Tomography; MRA: Magnetic Resonance Angiography

Introduction

Superior Mesenteric Artery (SMA) syndrome or Wilkie's syndrome is a rare condition with an incidence of 0.1 to 0.3 [1]. The radiological findings can be characterized by the aortomesenteric angle being less than 25 degrees, and an aortomesenteric distance of less than 8 mm resulting in vascular compression to the third part of the duodenum between the aorta and the superior mesenteric artery [2]. Symptoms usually are nonspecific and need a high index of suspicion with a radiological investigation being the gold standard modality in the diagnosis of SMA syndrome. We are reporting a case of a 19 years old female patient with gastric outlet obstruction with incidental finding of SMA syndrome, secondary to corrosive ingestion.

Citation: Marzooq A, Alsahwan A, Alsafwani J, Dandan O, A Suicidal Attempt Leading to a Rare Diagnosis: A Case Report of Superior Mesenteric Artery Syndrome Discovered after Corrosive Ingestion. J Surg Surgic Case Rep. 2020;1(1):1002.

Publisher Name: Medtext Publications LLC

Manuscript compiled: July 3rd, 2020

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Case Presentation

A 19-year-old female, not known to have any medical illness, except for psychiatric depression, was brought to the emergency department after ingestion of cleaning detergent. She presented with abdominal pain that was associated with nausea, sore throat, coffee ground vomitus, and difficulty swallowing. Physical examination was unremarkable. Basic labs and toxicity profiles, chest, and abdominal x-ray were unremarkable. Initial Esophagogastrodudenoscopy (EGD) after admission concluded the finding of severe esophageal/gastric corrosive injury. The patient was kept NPO and started on TPN feeding. After two weeks of being observed, she was started on clear fluid, which she could not tolerate. A month later another (EGD) was done which showed severe pyloric deformity leading to almost gastric obstruction with retention of fluid and food content. In addition, contrast meal study, showed a hugely dilated stomach reaching the pelvis, contrast did not pass into the duodenum after 30 minutes from the start of the study (Figure 1).

The surgical option in the form of laparoscopic gastrojejunostomy was discussed with the patient and agreed on. Intraoperatively, the diagnostic laparoscopy showed a distended hyperemic stomach, which was associated with adhesions (Figure 2). While creating the gastrojejunostomy a moderate amount of pus was noted coming from the stomach, and after applying suction the stoma was closed in a hand sewing fashion using 3.0 Stratafix suture materials. Post-op, contrast meal, and CT showed no signs of leaking, intact anastomosis sites, and findings of superior mesenteric artery syndrome inform of aorta distance with SMA measuring 5 mm and an aortic angle of 20 degrees (Figure 3).

Upon discovering these findings, a detailed history was obtained from the patient regarding her condition prior to the incident. She complained of recurrent attacks of vomiting with epigastric pain,

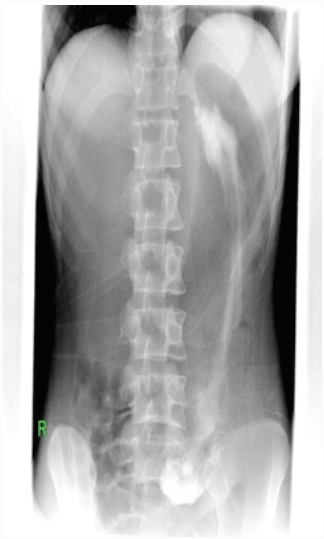

Figure 1: A barium study was done pre-operatively showing, an enlarged stomach reaching the pelvis. Contrast is appearing as a long-curved line, highlighting the curvature of the stomach.

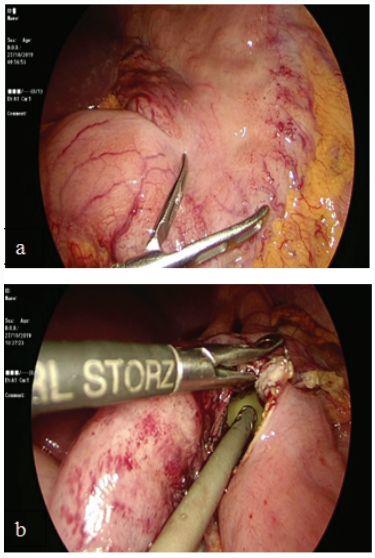

Figure 2: (a) A laparoscopic picture showing the stomach upon inspection, it was noted to be a hyperemic and largely distended stomach. Showing an extremely enlarged stomach, with dilated vessels on the surface. (b) Pus is being suctioned from the stomach, upon applying the anastomosis.

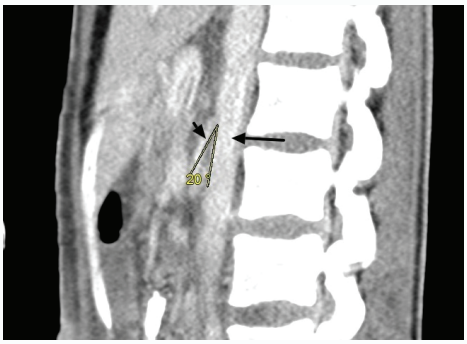

Figure 3: MRI showing sign of SMAS. (long arrow) showing the descending abdominal aorta. (short arrow) superior mesenteric artery. And the aorto-mesenteric angle is marked as 20 degrees.

early satiety, and a decrease in appetite, which has been present for years. Further, the patient mentioned an unintentional weight loss of about 10 kg in the last 6 months. A Liquid diet was started on the 4th day postoperatively before progressing to a full diet slowly. She was discharged in good condition on the 8th day postoperatively. Complete resolution of the symptoms was recorded on multiple visits to the clinic in 6 months following the surgery.

Discussion

Gastric Outlet Obstruction (GOO), is defined as incomplete emptying of gastric content into the duodenum due to partial or complete obstruction in the distal stomach, pylorus, or duodenal bulb [3]. GOO can be caused by peptic ulceration, tumor, caustic ingestion, chronic granulomatous disease, or eosinophilic gastroenteritis [4]. Gastrojejunostomy is the most commonly used procedure in cases of gastric outlet obstruction [5].

SMA syndrome is a rare entity that can cause small bowel obstruction, the first case of SMA syndrome was described in 1861 by Carl Von Rokitansky, as an autopsy finding [6]. In 1927, Wilkie explored the pathophysiology and the diagnostic findings from his experience with 64 patients. He published it as chronic duodenal ileus, with suggestions for the modality of treatment. Hence led to naming the syndrome after him [7]. The incidence of this syndrome is 0.1% to 0.3%, occurring more in the young-adult age group and more prominence in female's sex [1,2]. And mostly between the age of 10 and 39 [8].

SMA is the second branch of the abdominal aorta, after passing the diaphragm just below the origin of the celiac trunk. Arising at the level of the first lumbar vertebrae, from the anterior aspect of the aorta and directed anteriorly downward giving a sharp angle with the abdominal aorta [9]. The normal measurement of the aortomesenteric angle is 38 degree to 65 degree, and normal aortomesenteric distance of 10 to 28. The syndrome occurs when the angle measures less than 25 degrees due to loss of fat pads cushion between the aorta and the SMA leading to vascular compression to the third part of the duodenum [8,10].

The causes of decrease aortomesenteric angle are classified as Acquired i.e., (dietary, hyper-metabolism conditions, or diseases can cause cachexia) or congenital i.e., (lumbar hyperlordosis, Ladd's bands, Short or hypertrophic ligament of Treitz) [11]. There are variable estimations for patients suffering from SMAS who have lost weight, where it is estimated to vary from 25% to 76%, with no actual association between the BMI and symptoms [10,12]. SMAS after surgeries to correct spinal deformities has been reported to reach up to 4.7%, many attribute these symptoms to the weight loss that occurs post-surgery more than the compression due to surgery [13-15].

Patients usually present with chronic nonspecific symptoms that may include epigastric abdominal pain, postprandial bloating, nausea, vomiting, or weight loss. These symptoms are usually aggravated by eating [1]. The diagnosis can be confirmed by different radiologic modalities i.e., (Barium swallow, CT, or MRA) after a high index of clinical suspicion [2].

Management of SMA syndrome can either be conservative or surgical, the aim of conservative management usually to increase the fat pads between the SMA and aorta. This approach includes correction of electrolyte imbalance, nutritional support, decompression of the GI tract, position therapy after eating, and prokinetic medications. Indication of surgical intervention is the failure of conservative management [9,16].

Duodenojejunostomy, gastrojejunostomy, and Strong's procedure are the recommended surgical options, with duodenojejunostomy being the most common procedure [17,18]. In literature gastrojejunostomy was the procedure of choice for SMAS patient that did not respond to palliative treatment. Gastrojejunostomy reduces compression of the stomach, but it does not treat the duodenal obstruction if present. Patients may still suffer from symptoms and may need further intervention. Although it's rare, complications such as blind loop syndrome, dumping syndrome and marginal ulcerations may be a concern. In years the popularity of this procedure decreased [19,20]. In 1908 duodenojejunostomy was described as a treatment for this condition, where it relives symptoms by creating a new route to bypass the obstruction. Many say it has a superior result from other surgeries although it has its fair share of complications [16,21].

In 1958 Dr. Strong described the procedure where the ligament of teritz is divided, to free the duodenum from the aorta-mesenteric angle and reduce the obstruction which is known today as Strong's procedure [22]. Although it's least invasive surgery, where no anastomosis of the bowels is required. But it is associated with a very high failure rate, where it's estimated to reach up to 25% [16]. Which is mainly due to a short inferior pancreaticoduodenal artery. Where despite the surgery the duodenum is retracted and cannot fall from the angle.

In 1998, Gersin and Heniford reported the first case of laparoscopic duodenojejunostomy [23]. And in 2008, The London Health Sciences Centre reported the first robotic-assisted intestinal bypass surgery to treat SMAS [24]. Recently other procedures have been reported to have good results such as robotic Strong's procedure, endoscopic duodenojejunostomy using magnets, or ultrasound as a guide [25-27]. The benefits of minimally invasive procedures are short hospital stay, decrease post-operative pain and early return to usual activities [17].

In our case, we had no prior knowledge of the underlying condition. As a result, we choose gastrojejunostomy as the surgical treatment for gastric outlet obstruction. As the patient had an unusual presentation where there are two sites of deformity. Pyloric stenosis and duodenal compression, the recommended surgical option for SMAS duodenojejunostomy has no beneficial effect, because of the first site of obstruction. From our experience with this patient, Gastrojejunostomy could treat the condition and relief the symptoms of both obstructions. With 6 months follow up, our patient had no complications, with a gradual return to normal activity.

Conclusions

SMAS is a rare condition on its own, and having an accompanying disease is even rarer. Although few cases have been reported, but still there are no set guidelines. Gastric outlet obstruction and duodenal obstruction do not commonly present together. Recommended surgical management regarding such cases is still not established. Gastrojejunostomy is a valid, safe approach that may be used in such conditions.

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