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Case Report

Laparoscopic duodenojejunostomy in a patient with superior mesenteric artery syndrome

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ABSTRACT

SMA syndrome is a rare occlusive vascular disease small bowel obstruction due to compression of 3rd part of duodenum between aorta and SMA. The patient usually presents with duodenal obstruction signs such as bilious vomiting, rapid weight loss. We present a case of a 23-years-old male patient with symptoms of GI obstruction. The radiological investigations revealed obstruction of 3rd part of duodenum between superior mesenteric artery and aorta with reduced aorto-SMA angle. After no significant improvement with conservative management was seen, the patient underwent laparoscopic duodenojejunostomy with complete resolution of symptoms.

Keywords: Aorta, Duodenum, Laparoscopy, Small bowel obstruction, Superior mesenteric artery

INTRODUCTION

Superior mesenteric artery syndrome, also known as Wilkies syndrome or cast syndrome is a rare condition characterized by the compression of the third part of duodenum between aorta and superior mesenteric artery.[4,7] This compression, typically occurring when the space between the aorta and SMA measures less than 8 mm and the aorto-mesenteric angle is less than 20 degrees, results in duodenal compression and obstruction, leading to high intestinal obstruction.[1,6] While numerous predisposing conditions have been identified, SMA syndrome is often precipitated by rapid weight loss. Here, we present the case of a 20-years-old male patient with a low body mass index (BMI) and no recent history of weight loss.[9] Surgical intervention was pursued after initial conservative management proved ineffective.

CASE REPORT

A 23 years old poorly built and poorly nourished male patient presents to the surgical OPD with complaints of abdominal pain, vomiting. Patient was having repeated episodes of abdominal pain - colicky in nature, confined to the epigastrium, aggravates after oral intake, with 4-5 bouts of bilious vomiting per day, early satiety, weight loss (approximately 8-10kgs) since the past 4-6 months.[1,2] The patient had alarming loss of appetite with multiple hospital visit and admissions in the past - all culminating in symptomatic conservative management. The patient was managed conservatively with ryles tube decompression with correction of electrolyte imbalance, prone and left lateral position for relief of pain. The patient was discharged on oral feeds, with relief of symptoms.

The patient presented a week later with obstructive symptoms. On examination the patient's vitals were unremarkable. The patient was poorly built and nourished, weighing 38 kgs and 156 cms tall with a BMI of 15.6. Abdomen on palpation revealed minimal generalized tenderness, more confined to epigastrium, with no guarding and no rigidity. The blood investigations were well within normal limits. Subsequent radiological investigations and ultrasonography revealed GI obstruction.[6,11] Abdominal

contrast enhanced CT established the diagnosis of SMA syndrome with distension of 1st, 2nd and 3rd part of duodenum and aortomesenteric angle of 14 deg and aortomesenteric distance of 5-6 mm.[3,5]

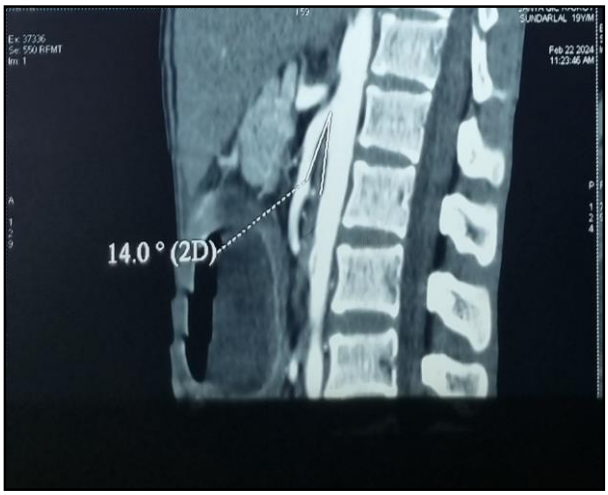

Figure 1: Aortomesenteric angle on cect.

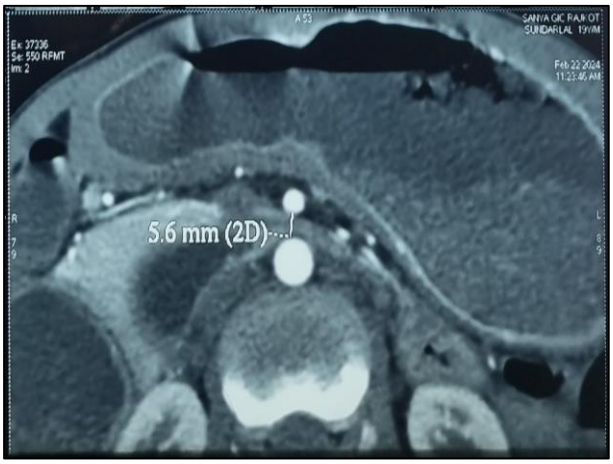

Figure 2: Aortomesenteric distance on CT.

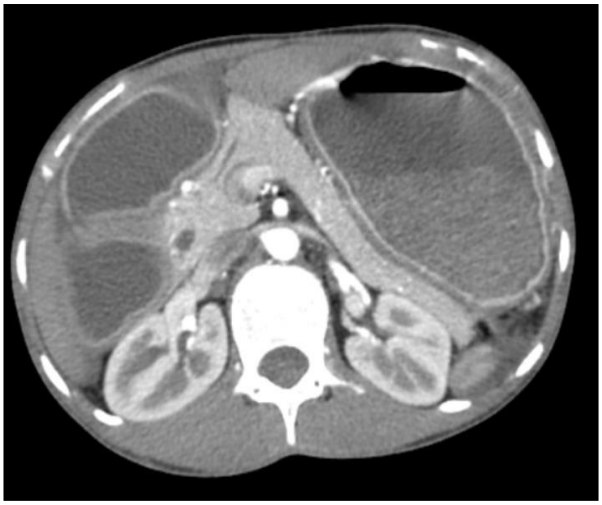

Figure 3: Dilated stomach and duodenum.

Figure 4: Dilated part of duodenum.

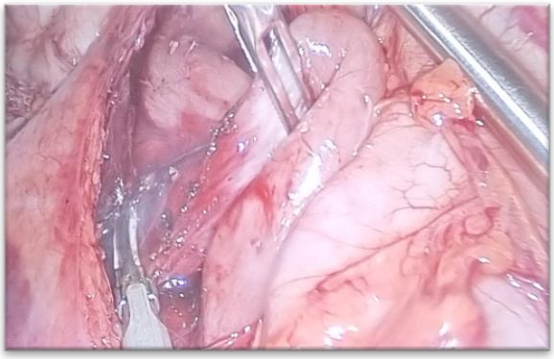

Figure 5: Mobilizing the part of jejunum.

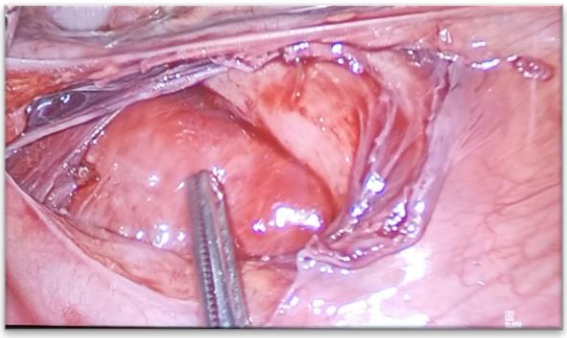

Figure 6: Peritoneum opened to expose duodenum.

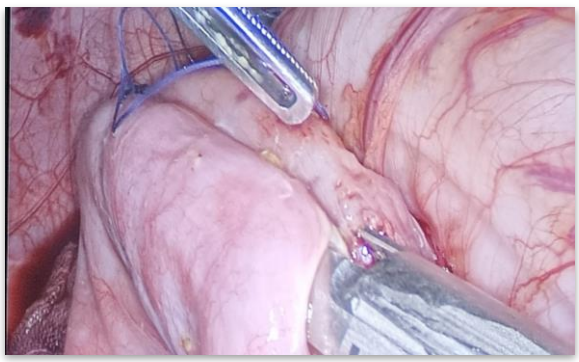

Figure 7: Anastomosis using endo GIA stapler.

After the initial conservative management didn't yield any fruitful results, the patient was taken up for laparoscopic duodenojejunostomy. After induction, pneumoperitoneum was created and 4 ports were inserted- one 10mm supraumbilical port, three 5 mm ports- two at either lumbar and one at left hypochondria. The transverse colon was lifted up to expose the dilated 2nd, 3rd part of duodenum and a loop of jejunum approx. 40-45 cm distal to DJ flexure were anastomosed (side to side) using endo GIA linear 45 mm stapler.

The post operative period was uneventful with bowel sounds appearing on POD 2 and patient passed stools on POD 2. Oral feeds with sips were started on POD 3, followed with liquids and soft diet on POD 4 and POD 5 respectively. Patient was discharged on POD 7. During the follow up checks, the patient didn't have any of the previous symptoms. After a 3-weeks follow up, the patient regained 600 gms weight.

DISCUSSION

Superior mesenteric artery syndrome is a rare (0.01-0.3%) 1, serious obstructive condition characterized by narrowing of aortomesenteric angle or reduction of aortomesenteric distance.[4,7] First discovered by Baron von Rokitansky and described by Wilkie, SMA causes duodenal obstruction and presents with vague and non-specific symptoms.[6] The most common symptoms include nausea, postprandial epigastric pain, bloating after meals, eructation, esophageal reflux, early satiety, anorexia, acute metabolic alkalosis, hypokalemia and chronic intractable bilious vomiting, potentially resulting in severe dehydration.[1,2,8] Patients may develop a fear of eating, perpetuating a cycle of weight loss.

The primary cause of SMA syndrome is significant weight loss, leading to a depletion of the fatty cushion surrounding the SMA.[9] Etiological factors can be categorized into congenital and acquired anatomical abnormalities, as well as debilitating conditions causing severe weight loss.[6] Congenital anatomical abnormalities may include a high insertion of the angle of Treitz or an atypical low insertion of the SMA. Acquired anatomical abnormalities can result from spinal trauma, corrective spinal surgery or abdominal surgery, which can cause tension on the small bowel mesentery. Conditions leading to severe weight loss encompass eating disorders (e.g., anorexia nervosa), burns, other catabolic states and wasting conditions such as malabsorptive states or neoplasia.

The first investigation is abdominal X-ray with may reveal a gastrointestinal duodenal distension, but the preferred investigation is fluoroscopy.[11] Contrast enhanced computed tomography is used to evaluate aortomesenteric vasculature. Narrowed aortomesenteric angle, decreased aortomesenteric distance, gastroduodenal dilation are the commonest features seen in CECT.[5,6]

Usually, the first therapeutic approach is a conservative treatment aimed at correction of electrolyte imbalance and providing nutritional support for weight gain.[2,9] In certain acute cases a combination of parenteral and enteral nutrition may be required. When conservative approach fails, surgical interventions come into play. One common surgical procedure is strong's procedure, which involves complete mobilization of the third and fourth portions of the duodenum and division of the ligament of Treitz.[9] Subsequently, the jejunum is passed behind the superior mesenteric axis and positioned to the right of the vessels. The advantage of Strong's procedure is that it doesn't require a gastrointestinal anastomosis. Another surgical intervention is gastrojejunostomy, but it has several disadvantages to it including dumping syndrome, blind loop syndrome, marginal ulceration.[8]

Duodenojejunostomy is the best and most widely accepted procedure with the best outcome.[3,5,10] It entails mobilizing a loop of jejunum (approximately 20 cm distal to the ligament of Treitz) and anastomosing it to the dilated second-third portion of the duodenum, thereby decompressing and bypassing the obstructed region. Today, minimally invasive duodenojejunostomy, including robotic procedures, boasts a success rate exceeding 90% and a complication rate of 7%.[3]

CONCLUSION

To conclude, laparoscopic duodenojejunostomy is a safe and effective treatment for SMA syndrome, providing results similar to open surgery while offering the benefits of minimally invasive surgery, such as reduced pain, shorter recovery times and fewer postoperative complications.[8,10] While follow-up data shows moderate improvements in weight gain and symptomatic resolution, the procedure remains the preferred option.[3,5] There is still scope for further improvements in preoperative assessment and treatment strategies to enhance patient outcomes.

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