CASE REPORT

SMA Syndrome – Wait & Nurture

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ABSTRACT

Superior mesenteric artery (SMA) syndrome is rare with the common presentation of megaduodenum from entrapment of the third part of the duodenum (D3) by the SMA. We present a case report of a thin, fit 16-year-old boy, active smoker complaining of generalized colicky abdominal pain associated with persistent postprandial vomiting. Small bowel study demonstrated partial duodenal obstruction from compression of the third part of the duodenum by the SMA. Computed tomography of the abdomen shows an aorto-mesenteric angle of 13 degrees with aorto-mesenteric distance of 0.32 cm, indicating SMA syndrome. His symptoms resolved spontaneously with watchful waiting and nutritional care plan. The success was contributed to restoring the fat cushion around the SMA, hence, widening the aorto-mesenteric angle. In conclusion, watchful waiting with a nutritional care plan is a feasible initial strategy in the approach to SMA syndrome. However, should this strategy be unsuccessful, the choice of surgical treatment is duodenojejunostomy.
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INTRODUCTION

Superior mesenteric artery (SMA) syndrome is a rare condition which results from extraluminal obstruction of the third part of the duodenum (D3) by the SMA, leading to mimicry of intestinal obstruction (1). The non-specific symptoms of SMA syndrome often delay the diagnosis (1). In this case report, we aim to share the rarity of SMA syndrome which was successfully treated with non-operative management.

CASE REPORT

A fit 16-year-old gentleman, an active smoker, presented to us with generalized colicky abdominal pain associated with persistent postprandial vomiting for the past two days. He has no significant past medical or surgical history. Abdominal examination revealed left hypochondriac region fullness with tenderness and hyperactive bowel sound. He was thin built and underweight with a body mass index (BMI) of 16 kg/m^2. The laboratory results were unremarkable.

Abdominal radiograph showed absence of bowel gas in the left hemiabdomen. Barium meal and follow-through demonstrated contrast hold-up at the third part of duodenum, with gross distension of the duodenum proximal to the third part of duodenum (Fig. 1).

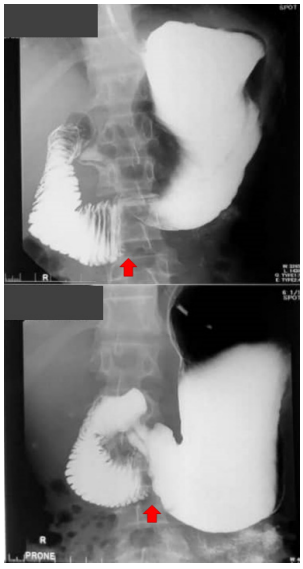

Fig.1: Barium follow-through study showing pooling of contrast at duodenum until the third part of duodenum (red arrow) with delayed gastroduodenal transit time.

Contrast-enhanced computed tomography (CECT) scan of the abdomen showed gross distension of the stomach and proximal duodenum with tapering at the third part of the duodenum. The aorto-mesenteric angle measured 13 degrees with aorto-mesenteric distance of 0.32 cm (Fig. 2 & 3).

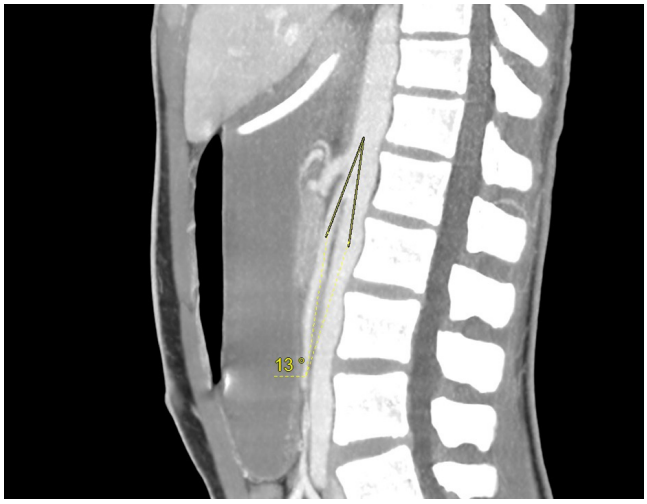

Fig. 2: The aorto-mesenteric angle was 13 degrees (yellow line).

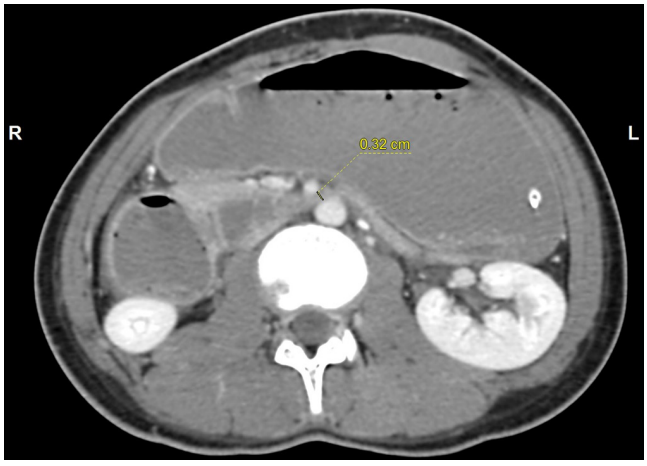

Fig.3: The aorto-mesenteric distance was 0.32 cm (yellow line).

He was treated conservatively with nasogastric tube decompression and broad-spectrum antibiotics. Intestinal obstruction leads to translocation of bacteria including both aerobic and anaerobic across the intestinal wall that subsequently led to septic complication. Factors that may increase risk of bacterial translocation includes host immune deficiency or immunosuppression (especially if the patient is malnourished). Given the background of his underweight and the intestinal obstruction, we started him prophylactically on broad spectrum antibiotics to prevent potential septic complication resulting from bacterial translocation in an immunosuppressed individual. He was reviewed by the nutrition support team and was prescribed parenteral nutrition in anticipation of prolonged bowel rest. However, he had shown remarkable improvement with passage of flatus on the third day of admission. Hence, the trial of oral feeding was initiated, bridged by parenteral nutrition. He continued to show improvement, tolerating semi-solid feed, and was allowed for discharge after six days of admission. Upon discharge, he was advised to return if symptoms recur; otherwise, reviewed at the outpatient clinic after two weeks. He continued to be well and remained asymptomatic during his six-month follow-up.

DISCUSSION

SMA syndrome is rare with the reported incidence of 0.013-1% of intestinal obstruction (2). SMA syndrome is defined as constitutional symptoms suggestive of upper gastrointestinal partial obstructions, extrinsic compression of the third portion of duodenum leading to chronic duodenal dilatation. It is confirmed by CECT scan images measuring the aorto-mesenteric angle of 7-22 degree and reduction of the aorto-mesenteric distance of 2-8mm (2,3). It is found commonly among females at the median age of 28 years old (3,4). The aetiologies of SMA syndrome are both congenital and acquired. Congenital low insertion of SMA or high insertion of the angle of Treitz, pulling the duodenum toward the root of mesentery leads to acute angulation and luminal narrowing (1). Acquired drastic overt weight loss due to catabolic diseases such as cancer, burn, trauma and malabsorption syndrome resulting in the reduction in fat cushion around the SMA, leads to progressive rigid and acute angulation (1,5). Surgical intervention that distorts the anatomy such as scoliosis corrective surgery could contributed to the narrowing of the aorto-mesenteric angle and leading to bowel obstruction (1). Other rare, acquired aetiology of SMA syndrome is abdominal aortic aneurysm.

The diagnosis of SMA syndrome is challenging and often delayed due to the non-specific presentations such as abdominal pain, bilious vomiting, early satiety, and postprandial distension (1–3). Others may present with complications such as gastric perforation, malnutrition and electrolyte imbalances (2,3). SMA syndrome can be diagnosed with barium upper gastrointestinal study and contrast enhanced computed tomography (CECT) of the abdomen. A hold up of contrast with grossly dilated first and second portions of the duodenum, with delayed gastroduodenal jejunal transit time are the classic findings in barium study for SMA syndrome (1). CECT of the abdomen on multiplanar view allows for an accurate measurement of the aorto-mesenteric angle and aorto-mesenteric distance (4). The normal aorto-mesenteric angle should range between 25-60 degree and the aorto-mesenteric distance between 10-28 mm.

SMA syndrome can be treated by watchful waiting or surgery. Watchful waiting is successful in up to 83% of patients (2,3). This strategy includes nasogastric

decompression, and nutritional support with electrolytes correction (2). The goal is to restore the fat cushion surrounding the SMA with nutritional support in order to relieve compression of the third portion of the duodenum (2). Proper positioning of the patient during feeding (left lateral decubitus, prone or modified knee chest) increases the aorto-mesenteric angle which may relieve the symptoms relate to SMA syndrome (2). The overall recurrence rate was reported up to 15.8%, which henceforth required surgical intervention (3).

Surgical interventions include bypass surgery with duodenojejunostomy, gastrojejunostomy or Strong's procedure. Duodenojejunostomy has a higher success rate, up to 90%, with fewer complications compared to gastrojejunostomy (4). Potential complications related to gastrojejunostomy include failure to completely release the duodenal obstruction, blind loop syndrome and recurrence of symptoms (3,4). Strong's procedure involves ligament of Treitz with duodenal mobilization. The main advantage being it does not involve bowel anastomosis. However, it was associated with 25% failure rate (3).

Learning points

1. SMA syndrome is rare accounting for 1% of all intestinal obstruction. CT diagnosis includes chronic duodenal dilatation, the aorto-mesenteric angle of 7-22 degree and reduction of the aorto-mesenteric distance of 2-8mm.
2. Watchful waiting strategy in SMA syndrome involves nasogastric decompression with concurrent parenteral nutritional support aimed to restore the fat cushion around the SMA.
3. Duodenojejunostomy is the preferred surgical procedure for SMA syndrome if the watchful waiting strategy is unsuccessful.

CONCLUSION

SMA syndrome is a rare disease which is often underdiagnosed and missed. Watchful waiting with nutritional support is a good initial treatment of SMA syndrome, surgical intervention could be offered as second line treatment if this is unsuccessful.

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