



## SUPERIOR MESENTERIC ARTERY SYNDROME

## General Surgery

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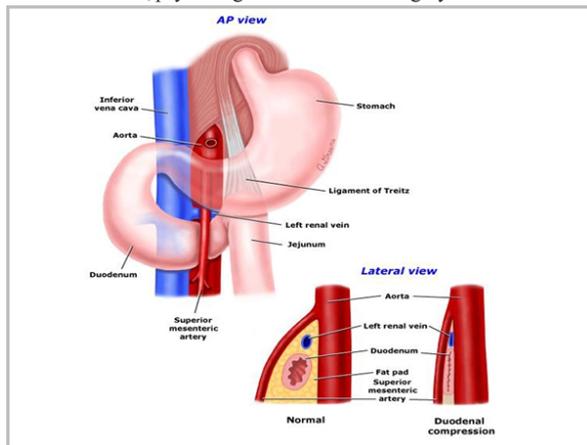
## KEYWORDS

## INTRODUCTION:

Superior mesenteric artery syndrome is an unusual cause of proximal intestinal obstruction. It has been referred to by a variety of other names including Cast syndrome, Wilkie syndrome, arterioesenteric duodenal obstruction, and chronic duodenal ileus.

The syndrome is characterized by compression of the third portion of the duodenum due to narrowing of the space between the superior mesenteric artery and aorta and is primarily attributed to loss of the intervening mesenteric fat pad.

Several factors can decrease the acuity of angle between the aorta and superior mesenteric artery. The most common is significant weight loss leading to loss of the mesenteric fat pad as a consequence of the medical disorder, psychological disorder and surgery.



## CASE REPORT

A 22 year old Hindu unmarried male patient presented to emergency department with chief complaints of generalised abdominal pain since 5 days aggravated on taking food, c/o distension of abdomen, vomiting 2 episodes before 5 days containing food particle, constipation since 2 days. Pt also had complain of low grade fever since 1 month, evening rise of temperature, c/o productive cough since 1 month, weight loss of approx 5 kg in 1 month. No c/o jaundice/ hemetemesis/ malena/ bleeding PR. Pt was admitted in private hospital for chest pain, cough, fever before 10 days and referred to CHA when patient developed features of intestinal obstruction.

Past history of pulmonary koch's before 2 years for which patient has taken AKT for 3 months. Patient drinks alcohol occasionally once or twice a month And smokes 1-2 bidis/day since last 2 years.

On G/E patient is fairly built and poorly nourished and well oriented to time place and person. Pulse 110/min, BP-130/80mmhg, Temp.-afebrile, RR- 20/min. On P/A exam abdomen was distended with no scar sinus or dilated veins. on palpation abdomen was soft with mild generalised abdomen tenderness and guarding. On percussion tympanic note was heard with no sign of free fluid in abdomen. On auscultation bowel sound were present. P/R examination no

ballooning. On investigation Hb- 13.4gm/dl, TC- 10800/cumm, DC- 79/12/2/7 and platelet1.8lac/cumm, S. Na- 138.4meq/l, S. K- 4.20 meq/l, urea 68.4 mg/dl, S. creatinine - 1.18, ADA- 17U/L (Normal <30IU), ESR- 44mm after 1 hour. On imaging study chest X-ray s/o consolidation in left mid and lower lung field and abdominal x-ray no free gas under diaphragm or air fluid level were found. Patient was suspected of having intestinal obstruction due to abdominal koch's and was given iv fluids and Ryle's tube was inserted. On RT insertion 2500ml gastric fluid came out and patient was suspected of having gastric outlet obstruction. On usg exam s/o gaseous abdomen with minimal inter-bowel fluid. Stomach appears overdistended with few small bowel loop appear prominent content filled and show to and fro movement up to duodenum. Patient was suspected of having SMA syndrome causing duodenal obstruction and CT angiography of abdominal vessel were carried out which showed- SMA angle is 7 degree with narrowed distance between aorta and SMA measuring 6 mm causing marked narrowing of 3rd part of duodenum with proximal dilatation of stomach which is reaching and extending up to umbilical region. Patient was treated conservatively for 5 days by iv fluid and injectable antibiotic and planned for surgery. Patient was operated by duodenojejunostomy (side to side) and jejunoejejunostomy (end to side) by creating roux En y loop of jejunum. 2 drain were kept one in Morrison's pouch and another in pelvis. Pt was started orally on pod 5. Patient was started on AKT for pulmonary Koch's.



## DISCUSSION

In the majority of patients, the normal angle between the superior mesenteric artery and the aorta is between 38 and 65° due, in part, to the mesenteric fat pad. In superior mesenteric artery syndrome, the angle can be narrowed to as low as 6° with the aortomesenteric distances as

low as 2 mm, which minimizes the space between the superior mesenteric artery and aorta, potentially leading to duodenal compression. Several factors can decrease the acuity of the angle between the aorta and superior mesenteric artery. The most common is significant weight loss leading to loss of the mesenteric fat pad as a consequence of medical disorders, psychological disorders or surgery. following corrective spinal surgery for scoliosis-Under this circumstance, it may be referred to as 'cast syndrome'.

### CLINICAL EVALUATION

Patients may present acutely (such as following surgery) or more insidiously with progressive symptoms. In both cases, symptoms are consistent with proximal small bowel obstruction. Patients with mild obstruction may have only postprandial epigastric pain and early satiety, while those with more advanced obstruction may have severe nausea, bilious emesis and weight loss. Patients may also have symptoms of reflux.

Symptoms may be relieved when patient is lying prone, in the left lateral decubitus, or in a knee-chest position. These positions remove tension from the mesentery and superior mesenteric artery opening the space between the superior mesenteric artery and aorta.

### DIAGNOSTIC STUDIES

-Plain abdominal films —may reveal findings suggestive of proximal small bowel obstruction such as gastric distension, dilation of the proximal duodenum, and, occasionally, an abrupt vertical cut off of air in the third portion of the duodenum.

-Oral contrast studies — Upper gastrointestinal series usually demonstrate marked delay in passage of the contrast from the duodenum into the more distal small bowel. Ultrasound identify and measure the aortomesenteric angle.

-Arteriography— Conventional arteriography was traditionally performed simultaneously with barium contrast radiography to demonstrate the superior mesenteric artery superimposed upon the barium-filled duodenum. Lateral mesenteric arteriography demonstrates the narrowing of the aortomesenteric angle.

-Computed tomographic (CT) and magnetic resonance (MR) arteriography have largely replaced conventional arteriography since they are non invasive and provide additional anatomic detail such as the amount of intra-abdominal and retroperitoneal fat.

Diagnostic imaging criteria — As a general rule, the following criteria should be present on imaging:

1. Duodenal obstruction with an abrupt cut off in the third portion and active peristalsis.
2. An aortomesenteric artery angle of  $\leq 25^\circ$  is the most sensitive measure of diagnosis, particularly if the aortomesenteric distance is  $\leq 8$  mm.
3. High fixation of the duodenum by the ligament of Treitz, abnormally low origin of the superior mesenteric artery or anomalies of the superior mesenteric artery.

**CONSERVATIVE THERAPY GOAL-** Alleviation of obstructive symptoms and reversal of any precipitating factors. Gastrointestinal decompression Correction of electrolyte abnormalities Nutritional support

### SURGICAL MANAGEMENT—OPEN SURGERY

**Strong's procedure** – Strong's procedure mobilizes the duodenum by dividing the ligament of Treitz. Once the duodenal-jejunal junction has been fully mobilized, the duodenum is positioned to the right of the superior mesenteric artery so it does not lie within the space between the aorta and the superior mesenteric artery. The integrity of the bowel is maintained; however, the short branches of the inferior pancreaticoduodenal artery may limit the ability of the duodenum to fall away from the aorta.

**Gastrojejunostomy** – Gastrojejunostomy is performed by bringing a loop of jejunum up to the stomach and performing a side-to-side anastomosis.

**Duodenojejunostomy** – With duodenojejunostomy the duodenum can be left intact or divided and the proximal jejunum brought through the right mesocolon to perform a side-to-side duodenojejunostomy.

**Laparoscopic approach** — Successful laparoscopic duodenojejunal

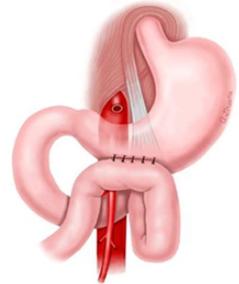
bypass has also been described. Although experience is limited, it offers a less invasive surgical option. Advanced laparoscopic techniques have been described for the Strong procedures and duodenojejunostomy.

**Follow-up** — Contrast studies are performed at one to two weeks postoperatively to demonstrate patency of the repair and normal emptying of the duodenum. Patients are followed for resolution of their preoperative symptoms and weight gain is monitored.

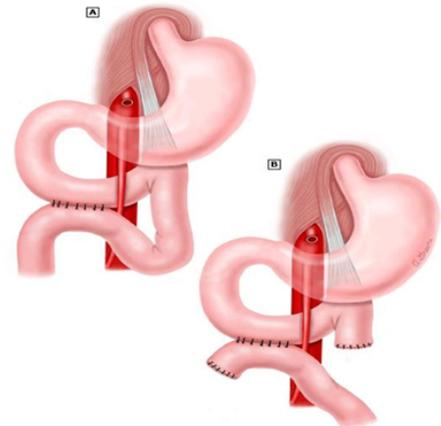
### Strong's procedure



### Gastrojejunostomy



### Duodenojejunostomy



### Outcomes and complications of surgery

Each of the surgical approaches has advantages and disadvantages. Strong's procedure maintains the integrity of the bowel; however, failure occurs in up to one fourth of patients. Gastrojejunostomy decompresses the stomach but the failure to relieve the duodenal obstruction may result in recurrent symptoms requiring a second procedure and the unrelieved obstruction may result in blind loop syndromes or peptic ulceration. Duodenojejunostomy is generally accepted as having superior results to both Strong's procedure and gastroenterostomy. Duodenojejunostomy with division of the fourth part of the duodenum establishes bowel continuity and minimizes the issues associated with a blind loop.

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