

## **SUPERIOR MESENTERIC ARTERY SYNDROME: AN UNUSUAL CAUSE OF DUODENAL OBSTRUCTION – A CASE REPORT AND LITERATURE REVIEW**

S.B. Saha, A. Mandal, D. Deoghuria  
Department of Surgery and Radiodiagnosis.  
Bankura Sammilani Medical College, Bankura, West Bengal, India

***SUPERIOR MESENTERIC ARTERY SYNDROME: AN UNUSUAL CAUSE OF DUODENAL OBSTRUCTION – A CASE REPORT AND LITERATURE REVIEW (Abstract):*** Superior mesenteric artery syndrome is a rare form of obstruction of horizontal part of duodenum entrapped between superior mesenteric artery and abdominal aorta. A case of a young male presented with longstanding abdominal pain, vomiting, and weight loss. Barium series, endoscopy, computed tomography scan, and doppler ultrasound made the diagnosis. The patient successfully underwent duodenojejunal anastomosis with a favourable outcome. It should be considered as a cause of vomiting and weight loss in children and young adults.

**KEY WORDS:** ARTERIO-MESENTERIC COMPRESSION, CHRONIC DUODENAL ILEUS, WILKIE'S SYNDROME, CAST SYNDROME, DOPPLER ULTRASOUND, DUODENOJEJUNOSTOMY

Correspondance to: Dr. Subhendu Bikas Saha, Pranabananda Palli, Kenduadihi, Bankura, West Bengal, India. Pin: 722102. Phone: 03242-257672 (R); + 919434183233 (M); e-mail: sbsaha@sancharnet.in; sunsubg@gmail.com\*

### **INTRODUCTION**

Superior mesenteric artery syndrome (SMAS) is an atypical clinical disorder of vascular compression affecting third part of duodenum (D3); first described by Von Rokitanski in 1800s [1,2]. Later, Wilkie coined the term „chronic duodenal ileus” and published a detail description of seven cases in 1927 [3]. Since then, although several cases are reported so far [1-4],<sup>4</sup> the disease remained a subject of controversy, and many have doubted its actual incidence [3]. Modern imaging techniques nevertheless have restricted the trend of over diagnosis. The young age, nonspecific symptoms often lead to a delay in diagnosis. This entity, over the years, acquired different names, such as chronic duodenal ileus, arteriomesenteric duodenal compression, Wilkie's syndrome and Cast syndrome [2,3].

### **CASE HISTORY**

A 19 years old male was referred to our hospital with progressively worsening intermittent, postprandial colicky upper abdominal pain with recurrent episodes of profuse bilious vomiting of partially digested food for last six years. Vomiting generally relieved his abdominal pain. He had usually one or two episodes of pain and vomiting every week for last six months and had lost about ten kilograms of weight during this period. He was treated for peptic ulcer disease by some local practitioner without any relief. The remainder of the history was non-contributory.

---

\* received date: 18.03.2009

accepted date: 27.04.2009

On examination, the patient was 168 cm tall, asthenic with body weight of 48 kg. Abdomen looked scaphoid with mild fullness in epigastrium. There was no hepatomegaly or ascites. Ausculto-percussion and succussion splash test gave a clinical impression of gastric distension. Relevant laboratory values were unremarkable. Barium meal series revealed an abrupt cut-off at the level of third part of duodenum (D3) with marked proximal dilatation (Fig. 1) and incomplete gastro-duodenal emptying. Upper GI endoscopy reported gastro duodenal stasis of food particles without any demonstrable intrinsic lesion except few antral erosions.



**Fig. 1 Barium meal series showing marked gastroduodenal dilatation with a vertical cut-off at the level of third part of duodenum**

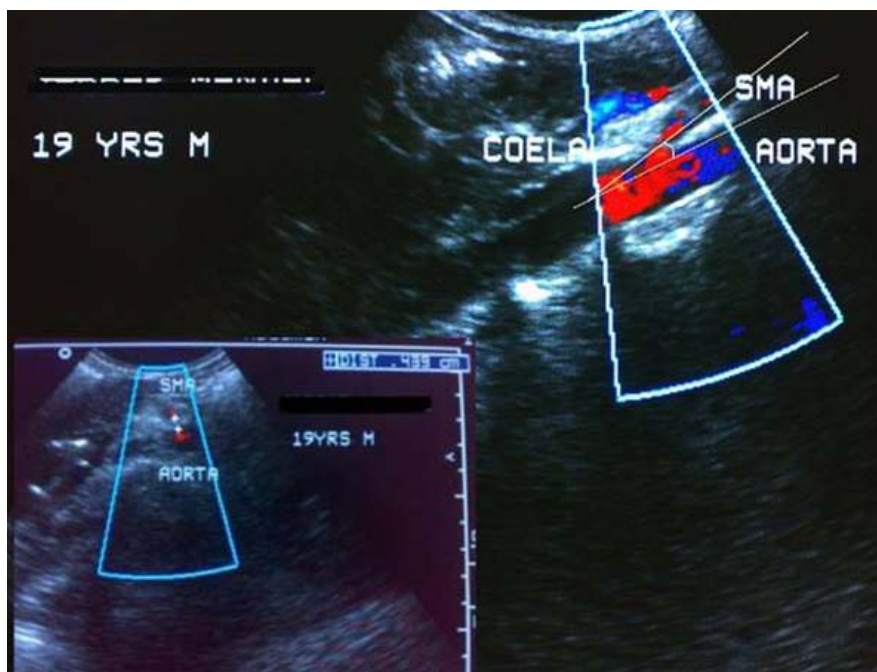
Contrast enhanced computed tomography (CT) scan detected narrowed segment of D3. Doppler ultrasound (USG) study of aorto-mesenteric area showed Superior Mesenteric Artery (SMA) - aorta angle of  $12^\circ$  on sagittal image (Fig. 2) and SMA - aorta distance of 4.39 mm on transverse image (Fig. 2, inset). The above imaging findings and clinical presentation correlated the diagnosis of SMAS.

Conservative trial was attempted for 3 weeks with nasogastric decompression, small, frequent, high caloric feeding, postural advice and supplementation but symptoms remained refractory.

Exploratory laparotomy confirmed compression of the D3. There was no evidence of any other cause of obstruction. A side-to-side retrocolic duodenojejunostomy bypass was done. The patient recovered uneventfully. During nine months follow up, he was symptom free and attained a body weight of 59.5 kg.

## DISCUSSION

SMA usually takes an angular downward course from ventral surface of aorta. It is through this vascular angle that the D3 passes. Normally fat and lymphatics around SMA maintains this angle and provide protection for duodenal compression. In SMAS, SMA-aorta angle is narrowed down to 7° to 22° (normal range 25° to 60°) and SMA-aorta distance is reduced to 2 -8 mm ( normal range 10 to 28 mm) [1,2,4].



**Fig. 2** Sagittal ultrasonography image shows SMA-aortic angle of 12° (white constructed angle); [inset - Transverse ultrasonography image showing SMA - aorta distance of 4.39 mm.]

Some etiological factors include dramatic weight loss resulting in loss of fat cushion (in extensive cancer and burns, malabsorption, eating disorders), high insertion and shortness of ligament of Treitz, low origin of SMA, peritoneal adhesion, duodenal malrotation, rapid linear growth without compensatory weight gain, scoliosis and body casting [1-5].

SMAS should be differentiated from SMA-like-syndrome (mega duodenum) found in several neuropathic and connective tissue disorders [1,3].

SMAS can be presented as chronic intermittent or acute duodenal obstruction in children and young adults, more often in females. Postprandial upper abdominal pain and fullness, bilious vomiting and rapid weight loss are the most characteristic symptoms. Food aggravates while certain postural adjustments like left lateral, knee-chest or prone position may relieve abdominal symptoms. As obstruction is usually incomplete, diagnosis is challenging, often made by process of exclusion [2,4].

Conventional barium study findings although characteristic but not specific for SMAS [1,5]. Non-invasive modalities like colour doppler ultrasonography, CT or magnetic resonance (MR) angiography are currently useful tools for diagnosis [1,2,4,5].

Unal et al [4], observed high clinical correlation with CT or doppler ultrasound-measured values of 8 mm for SMA-aorta distance (100% sensitive and specific) and 22° for SMA-aorta angle (42.8% sensitive and 100% specific).

The initial treatment of this condition is generally conservative. Surgery is indicated in longstanding and unresponsive cases or in massive duodenal dilatation and stasis [2,5].

Duodenojejunosomy, open or laparoscopic, is the most accepted procedure with success rate of 90% [1,2,5].

#### **ACKNOWLEDGEMENT**

We would like to thank Dr. M. Chaudhury, Principal, B. S. Medical College for his support in submission of this manuscript to this journal

#### **REFERENCES**

1. Shukla RC, Pathak R. Superior mesenteric artery syndrome: case report. *Nepal Med Coll J.* 2008; 10(2): 144-145.
2. Baltazar U, Dunn J, Floresguerra C, Schimidt L, Browder W. Superior mesenteric artery syndrome: an uncommon cause of intestinal obstruction. *South Med J.* 2000; 93(6): 606-608.
3. Ahmed AR, Taylor I. Superior mesenteric artery syndrome. *Postgrad Med J.* 1997; 73: 766-768.
4. Unal B, Aktaş A, Kemal G, Bilgili Y, Güliter S, Daphan C, Aydinuraz K. Superior mesenteric artery syndrome: CT and ultrasonography findings. *Diagn Interv Radiol.* 2005; 11(2): 90-95.
5. Makam R, Chamany T, Potluri VK, Varadaraju PJ, Murthy R. Laparoscopic management of superior mesenteric artery syndrome: a case report and review of literature. *J Min Access Surg.* 2008; 3: 80-82.