

CASE REPORT

Superior Mesenteric Artery Syndrome: A Case Report

Esma Leila Gouta, Abdelwahed Yahmadi, Saber Rbeii, Ayoub Zoghlami

Department "B" of General Surgery, Charles Nicolle Hospital, Boulevard du 9 Avril, 1006 Tunis, Tunisia

ABSTRACT

Introduction Superior mesenteric artery syndrome is a rare cause of upper intestinal obstruction due to a compression of the third portion of the duodenum between aorta and superior mesenteric artery. **Case presentation** we report a case of 17 years old male patient which have a low body mass index. The diagnosis was confirmed by typical finding of the abdominal scan. Surgery was necessary after failure of initial conservative management. **Conclusions** This case of superior mesenteric artery syndrome to be implicated to the majority of patients without history of weight loss and the superiority of Duodenojejunostomy compared to gastrojejunostomy.

INTRODUCTION

Superior mesenteric artery syndrome (SMAS) is a rare condition, also known as Wilkie's syndrome is caused by compression of the third portion of the duodenum between aorta and superior mesenteric artery (SMA). A reduced space between aorta and SMA less than 8 mm and an aorto- mesenteric angle less than 20 degrees causes a duodenal compression and stop the progression of the bolus explaining the high intestinal obstruction. Numerous predisposing conditions have been identified, but usually favored by rapid weight loss. We report a case of a 17 years old male patient with low body mass index (BMI) and no history of recent weight loss. Surgical treatment was achieved after failure of initial conservative treatment.

CASE REPORT

A seventeen-year-old male patient with no significant medical history presented to our Emergency department with a complaint of upper abdominal pain, nausea, vomiting and abdominal distention for three days. His body mass index at admission was 15. There is no history of recent weight loss. The physical examination revealed a distended abdomen sensitive to palpation. Laboratory results were unremarkable. A standard X-ray showed distention of the stomach with air fluid level and duodenal gas (**Figure 1**). Abdominal CT-scan visualized major dilatation of the stomach, the first and the second portion of the duodenum. The junction level involved the third portion of the duodenum, which appeared compressed

between the aorta and the superior mesenteric artery (SMA) due to a small aorto-mesenteric distance (4.4 mm) (**Figure 2**). The aorto-mesenteric angle measured 11° (**Figure 3**). The diagnosis of SMA syndrome was assumed and conservative management including parenteral nutrition and aspiration tube was started. Stomach tube produced 2L of bilio-digestive fluid daily. After ten days, this treatment was considered ineffective and open gastrojejunostomy was performed. Post operative period was marked by recurrence of symptoms after removal of the nasogastric tube. A second abdominal CT scan was



Figure 1. Abdominal X-ray showed distention of the stomach with air fluid level and duodenal gas.

Received February 24th, 2016 - Accepted April 25th, 2016

Keywords Body Mass Index; Intestinal Obstruction; Superior Mesenteric Artery Syndrome

Correspondence Esma Leila Gouta
Department "B" of General Surgery
Charles Nicolle Hospital, Boulevard du 9 Avril
1006 Tunis, Tunisia
Phone +21698540006
E-mail pink2203@hotmail.com

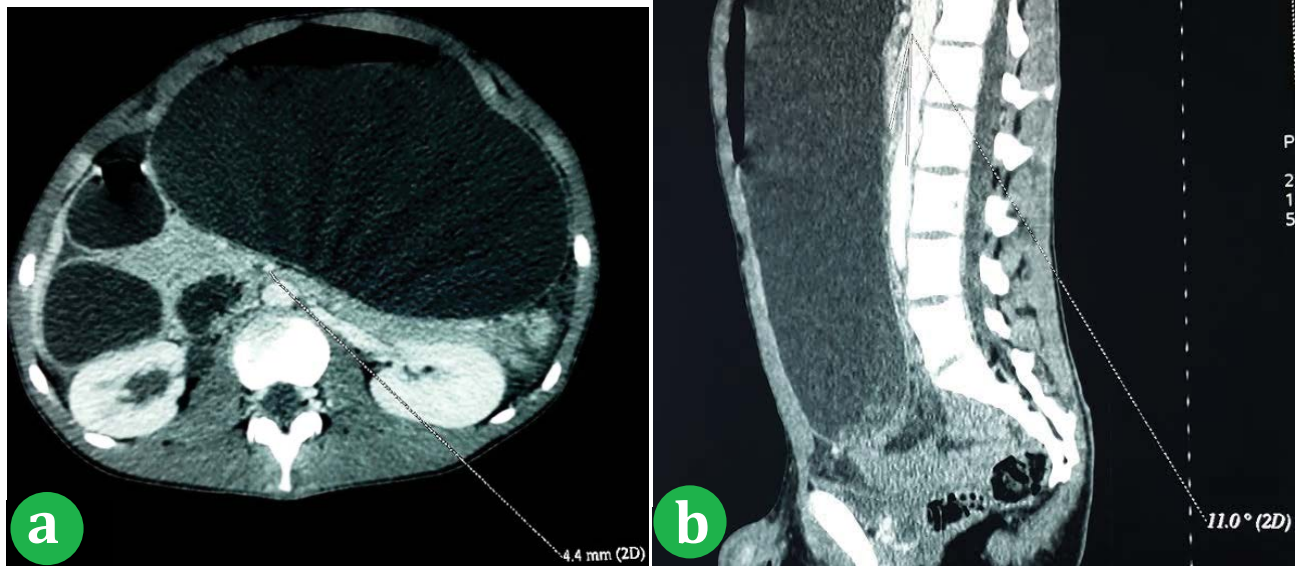


Figure 2. Abdominal computed tomography. Abdominal computed tomography showed distension of the stomach and the duodenal bulb due to compression of the third portion of duodenum. The distance between the abdominal aorta and superior mesenteric artery was 4.4 mm **(a)**. The angle between the abdominal aorta and superior mesenteric artery was 11° **(b)**. AAo, abdominal aorta; D, duodenum; SMA, superior mesenteric artery.

performed and showed the same imaging features than last one. Twelve days later we have seen no improvement and we decided to practice a side-to-side duodenojejunostomy after removal of the initial gastrojejunostomy. The postoperative period was uneventful. Intestinal transit was noted on the second postoperative day. The patient was discharged on the seventh postoperative day. At the follow-up visit at 1 month and 3 months the patient had complete resolution of his preoperative symptoms.

SMA syndrome was first described by Rokitsky in 1842. The pathogenic mechanism, as described by Wilkie in 1927, involves a small aorto-mesenteric space and extrinsic compression of the third portion of the duodenum between the SMA and the posterior structures. It is rare condition with prevalence between 0.013 % and 0.3 % [1] that usually occur in young women between 18 and 35 years old [2]. Several pathophysiological theories have been advanced as the role of the mesenteric lymph nodes and the existence of a hypertrophied Treitz ligament. But the most common cause of SMA syndrome is severe weight loss including trauma, burns, chemotherapy, anorexia nervosa and/or after prolonged bed rest causing a massive and rapid reduction in the thickness of adipose tissue of the aorto- mesenteric space which is normally supposed to maintain the aorto mesenteric angle open and protects the duodenum of the vascular compression [3, 4]. A Wambre-Nicolas *et al.* [5] demonstrated that Aortomesenteric angle's width is related to the body mass index. In our patient the etiology of SMA syndrome may be related to the undernutrition with low BMI. There are two non-specific clinical forms: The most common form (90 %) is made of

chronic intermittent epigastric pain, nocturnal bilious vomiting worsening in supine position and improving by the left lateral or the seated positions. The second form, such as our case, is a rare form made of a severe bowel obstruction which can be life-threatening [2]. The diagnosis is confirmed by abdominal CT scan with contrast, which shows a gastroduodenal expansion to the third duodenal portion. The Arteriographic criteria include a significantly decreased aorto-SMA angle of 6° to 25° (nl=45°) and a shortened aortomesenteric distance of 2 to 8 mm (nl=10 to 20 mm) [6], which is the case in our observation. Complications can affect kidneys (renal failure, fluid and electrolyte disorders), or respiratory tract (acute respiratory failure) or the occurrence of gastric rupture [7, 8].

The main differential diagnosis to discuss is the mégaduodénum, another rare anomaly which represents a form of intestinal pseudo-obstruction of the small intestine localized in the upper part of the digestive tract. It is manifested by the same symptoms and the same radiological abnormalities. Only, bowel manometry studies or histological analysis of transmural biopsies of the duodenum could distinguish between these two pathologies.

Treatment is primarily medical with introduction of nasogastric tube suction gently with correction of electrolyte disturbances and introduction of parenteral or enteral feeding by a jejunostomy, whose goal is weight gain. Besides, left lateral decubitus or sitting position in order to reduce the pressure on the duodenum for the temporary relief of duodenal compression [9]. Myung Seok Shin *et al.* [10] reported a study including eighteen

children with SMAS, medical management was successful in 72.2% and the median duration of this treatment was 45 days. If medical management fails, surgery should be contemplated. Gastrojejunostomy is one option but seems to be associated with complications including dumping syndromes, blind loop syndrome, and marginal ulceration. Another option could also be Strong intervention which consists in dividing the Treitz ligament and lower the fourth portion of the duodenum. A major advantage of the procedure is the avoidance of a gastrointestinal anastomosis [11, 12]. Duodenojejunostomy is the third surgical option and can be used when either of the other operations fails. As we move in the era of laparoscopic surgery all this procedures can be laparoscopically achieved. We opted first for a gastrojejunostomy but twelve days later we have seen no clinical or radiological improvement so we decided to practice a duodenojejunostomy. Operating course was uneventful.

CONCLUSIONS

SMAS is a rare cause of duodenal obstruction. Contrast-enhanced computed tomography (CT) is noninvasive tool for diagnosis. First intention treatment is conservative management but surgery may necessary. Duodenojejunostomy should be the preferred technique as it seems to offer the best outcome.

Conflicts of Interest

The authors do not have any conflicts of interest to disclose.

References

1. Unal B, Aktas A, Kemal G. Superior mesenteric artery syndrome: CT and ultrasonography findings. *Diagn Interv Radiol* 2005; 11:90-5. [PMID: 15957095]
2. Kalouche I, Leturgie C, Tronc F, Bokobza B, Michot F, Pons P. Le syndrome de la pince mésentérique. A propos d'une observation et revue de la littérature. *Ann Chir* 1991; 45:609-62.
3. Bonnet JP, Louis D, Foray P. La pince aortomésentérique. *Arch Pediatr* 1995; 2:333-8.
4. Ortiz C, Cleveland RH, Blickman JG, Jamarillo D, Kim SH. Familial superior mesenteric artery syndrome. *Pediatr Radiol* 1990; 20:588-9. [PMID: 2251002]
5. Wambre-Nicolas A, Pennec VL, Geffard B, Ardouin L, Schmutz G, Salamé E. ANAT4 La pince aorto-mesenterique : correlation entre radio-anatomie et indice de masse corporelle. *Journal de Radiologie* 2006; 87:1436.
6. Loeb T, Loubert G, Morsly R, Gabillet JM, Pasteyer J. Syndrome de l'artère mésentérique supérieure. *Ann Fr Anesth Reanim* 1999; 18:1000-4. [PMID: 10615549]
7. Banerjee A, O'Neil R, Bidstrup H. Adult respiratory distress syndrome caused by superior mesenteric artery syndrome. *Anesth Intensive Care* 1994; 22:602-4. [PMID: 7818068]
8. Saul SH, Dekker A, Watson CG. Acute gastric dilatation with infarction and perforation. Report of fatal outcome in patient with anorexia nervosa. *Gut* 1981; 22:978-83. [PMID: 7308853]
9. Merrett ND, Wilson RB, Cosman P, Biankin AV. Superior mesenteric artery syndrome: diagnosis and treatment strategies. *Gastrointest Surg* 2009; 13:287-92. [PMID: 18810558]
10. Myung Seok Shin and Jae Young Kim. Optimal duration of medical treatment in superior mesenteric artery syndrome in children. *J Korean Med Sci* 2013; 28: 1220-1225. [PMID: 23960451]
11. Kadji M, Naouri A, Bernard P. Syndrome de la pince aortomésentérique: à propos d'un cas. *Ann Chir* 2006; 131:389-92.
12. Kim IY, Cho NC, Kim DS, Rhoe BS. Laparoscopic duodenojejunostomy for management of superior mesenteric artery syndrome: two cases report and a review of the literature. *Yonsei Med J* 2003; 44:526-9. [PMID: 12833593]