Superior mesenteric artery syndrome: an unusual cause of intestinal obstruction

Ta-Pin Lee¹,* , Wen-Chih Huang²,³

ABSTRACT

Superior mesenteric artery (SMA) syndrome is a condition arising from the compression of the duodenum between the SMA and the aorta and subsequently causing bowel obstruction. Its initial management is usually conservative with nutritional support. Surgical intervention is indicated when conservative management fails. We report a case with SMA syndrome and episodes of intestinal obstruction, which was successfully treated by duodeno-jejunostomy.

Keywords: superior mesenteric artery syndrome, superior mesenteric artery, intestinal obstruction

INTRODUCTION

The SMA syndrome is a rare cause of intestinal obstruction. It is characterized by extrinsic compression of the third portion of the duodenum by narrowing of the aortomesenteric angle that is primarily attributed to loss of the intervening mesenteric fat [1]. This unusual illness was first reported by Von Rokitanski and has been known as Wilkie Syndrome, the author who published the largest series of cases in 1927 [2]. It usually occurs in thin and young females, and often caused by weight loss due to harsh dieting or a eating disorder. Because the symptoms can include nausea and early satiety, it is important and necessary to take a recent history, especially of weight loss. The final diagnosis rests on abdominal computed tomography, which confirms a decrease of an angle between the superior mesenteric artery and the abdominal aorta. We believe this article would be helpful for the education of the young medical staff.

CASE REPORT

This 24-year-old woman presented with intermittent dull pain in the lower abdomen for about...
three months. She was slim, her body weight was 42 kilograms, and she denied significant weight loss, major illness or trauma before coming for consult. She had visited the local hospital and diagnostic laparotomy yielded inconclusive findings. The symptom persisted and eventually progressed to frequent episodes of diffuse abdominal discomfort, especially in the epigastric region. Postprandial discomfort was also reported. Nausea and vomiting were usually presented two hours after meals. Physical examination revealed epigastric tenderness. Upper gastrointestinal panendoscopy disclosed superficial gastritis. Upper gastrointestinal radiography with a barium meal ingestion showed compression of the third portion of duodenum with delay in contrast passage (Figure 1). Subsequent abdominal computed tomography demonstrated compression at the third part of the duodenum and an acute angle (13 degrees) between the superior mesenteric artery and the aorta, suggesting SMA syndrome (Figures 2 and 3). Total parenteral nutrition was given in the interim for nutrition support. The abdominal discomfort remained despite the treatment, and surgical intervention was indicated. An open duodenojejunostomy was carried out thereafter. Her physical condition improved gradually after the operation and she was discharged without any complication.

**DISCUSSION**

The cause of superior mesenteric artery syndrome is stark weight loss due to various conditions such as malignancy, bariatric surgery, trauma, chronic infections, severe burns, etc. Young and thin females like our subject, are also predisposed to the illness. Reduction in the mesenteric fat tissue...
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Surrounding the duodenum ensues, and results in shortening the distance and reducing the angle between the SMA and the aorta. Other predisposing factors may be congenital, such as a short Treitz’ ligament, high insertion of the duodenum at the Treitz’ ligament, and abnormal low origin of the SMA. Anatomical changes caused by surgical procedures such as scoliosis correction surgery and esophagectomy can also induce SMA syndrome [3,4].

According to a document reported by V. Bi-ank et al., the most frequent symptoms include abdominal pain, vomiting, nausea, early satiety and anorexia [5]. The condition is generally thought of as a diagnosis of exclusion. Patients might experience relief when lying prone, as opposed to supine where gravity contributes to the duodenal compression. According to the patient’s symptoms, the clinician should be aware of the diagnosis due to the great similarity of symptoms with other more common gastrointestinal diseases, such as peptic ulcer, cholecystitis, pancreatitis, mesenteric ischemia. Our patient received upper gastrointestinal panendoscopy and excluded peptic ulcer disease.

The condition of obstruction can progress and result in compression of the inferior vena cava and aorta. Subsequent increases in cardiac output and distal ischemia may cause lactic acidosis, metabolic derangement, and even death [6].

Plain radiograph may show evidence of proximal obstruction such as massive gastric distention. Upper gastrointestinal series may show compression of the third portion of duodenum, as in our case, with delay in contrast passage. The diagnosis mainly depends on abdominal computed tomography, which confirms the loss of an angle between the superior mesenteric artery and the abdominal aorta to less than 20 degrees. The distance between the two vessels is also less than 6mm (the normal distance is 8–12 mm) [7]. The patient’s angle between the superior mesenteric artery and the aorta was 13 degrees, which meets the diagnostic criteria of SMA syndrome.

Conservative management is recommended first with initial gastrointestinal decompression, correction of electrolyte abnormalities and nutritional support for weight regain and growth of the fat pad between the SMA and aorta. For those unable to attain adequate caloric intake by mouth, nasojejunal tube feedings placed past the obstruction can be applied. Nasojejunal feeding is thought to offer a more durable alternative without the accompanying surgical morbidity [8].

Total parenteral nutrition is also an option if nasojejunal feedings remain inadequate. However, enteral feeding tubes remain more favorable because they enable a better response to nutritional therapy.

Surgery is indicated for failed conservative management and for patients with chronic and refractory symptoms. The three main surgical proposals are the Strong operation, gastrojejunostomy and duodenojejunostomy. Duodenojejunostomy has demonstrated greater effectiveness in solving symptoms, and the laparoscopic approach has been adopted as a viable alternative with the advancement of minimally invasive surgery [9]. Recently, the use of robotics in the SMA syndrome surgery has gained popularity. This advanced technology provides surgical movement with great precision under a three-dimensional view of the surgical field [10].

In conclusion, SMA syndrome is rare and may mimic symptoms of acute or chronic upper intest-
tinal obstruction. The patients are usually young and thin in body type. It should be also suspected for those experiencing significant body weight loss in short period of time. The initial management is conservative with decompression and nutritional support. Surgical duodenojejunostomy is indicated when conservative management fails.

REFERENCES

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上腸系膜動脈症候群: 罕見的腸阻塞病因

李達彬 1,*，黃文志 2,3

中文摘要

上腸系膜動脈症候群（superior mesenteric artery syndrome）是上腸系膜動脈和主動脈之間的十二指腸遭受擠壓而引起的腸阻塞的病症。其處理通常以保守性治療及營養支持為優先考量，而當保守性治療失敗後才考慮手術。我們提供一則上腸系膜動脈症候群及腸阻塞的病例報告，其後成功接受十二指腸空腸吻合術（duodenojejunostomy）治療。

關鍵字：上腸系膜動脈症候群；上腸系膜動脈；腸阻塞

1 亞東紀念醫院放射科
2 亞東紀念醫院解剖病理科
3 國立台北护理健康大學護理學院
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*通訊作者：李達彬 電子信箱：leetapin@gmail.com