CASE REPORT

Superior mesenteric artery syndrome caused by weight loss in a malnourished Syrian man

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Abstract

Superior mesenteric artery syndrome is a rare cause of upper gastrointestinal obstruction in which the third part of the duodenum is compressed between the superior mesenteric artery and the abdominal aorta, and the compression of the duodenum is caused by a narrowed aortomesenteric angle. We report in this case a 35-year-old patient who came with features of small bowel obstruction, weight loss and had a history of malnutrition because of war. Multi-slice computerized tomography showed a narrowed aortomesenteric angle and distance. Conservative treatment was presented and, after 3 months of observation, the patient gained weight.

Key words: superior mesenteric artery syndrome; aortomesenteric angle; upper gastrointestinal obstruction; malnutrition

Introduction

Superior mesenteric artery (SMA) syndrome is one of the rare causes of small bowel obstruction [1]. The defining feature of this syndrome is the compression of the third part of the duodenum due to narrowing of the space between the SMA and the abdominal aorta leading to upper gastrointestinal obstruction [2]. The true incidence of this syndrome is unknown, but it has been estimated to be approximately 0.013–0.3% [3]. Catabolic states and malnutrition as in this case may predispose to this condition by a reduction in retroperitoneal fat tissue. SMA syndrome can present itself as acute small bowel obstruction or as intermittent compression with chronic symptoms. The classical presentation is recurrent postprandial pain, nausea, vomiting, bloating, abdominal discomfort or pain and tenderness. In this case, we present a patient with SMA syndrome (written informed consent was obtained from the patient), aiming to draw doctors’ attention to it, and to include it in the differential diagnosis of proximal intestinal obstruction symptoms. In addition, it should be considered as a complication of malnutrition and starvation experienced in wars and catastrophes, and so should be kept in the minds of health workers in such situations.

Case presentation

A 35-year-old Caucasian man presented to the Gastroenterology Department at Aleppo University Hospital with postprandial non-projectile vomiting that started 2 months earlier with no abdominal pain. As a history, he had experienced excessive...
weight loss because of hunger and malnutrition caused by the difficult humanitarian situation related to Syrian war, leading to weight loss within 5 months from 135 kg (body mass index [BMI]: 42.61 kg/m²) to 100 kg (BMI: 31.56 kg/m²) before the chief complaint started. After the vomiting problem described above began, he lost an additional 40 kg, weighing 60 kg (BMI: 18.94 kg/m²) over 4 months. He had no other comorbidities. His abdomen was soft and not distended, and vital signs and review of other systems were normal. Laboratory findings revealed a mild decrease in serum albumin and a mild elevation in aspartate transaminase (AST) and alanine aminotransferase (ALT). The echography of the abdomen had not revealed any problems. On endoscopy, no gastric outlet obstruction or other abnormalities had been found. When we reached the end of the second part of the duodenum, we pumped air to show the third part. A narrowing in the third part of the duodenum was detected. The mucosa of the stomach and duodenum was normal, and no inflammatory changes were noticed. Multi-slice computerized tomography (MSCT) showed compression of the third part of the duodenum between the aorta and the SMA due to decreased distance (3.9 mm) and narrowed angle (14.6°) between these two arteries (Figure 1). A diagnosis of SMA syndrome was made. A conservative therapy of high-calorie diet was applied through a nasojejunal tube. The patient started gaining weight fast and postprandial vomiting was disappearing gradually. After 7 days, the nasojejunal tube was removed completely and the patient tolerated an oral diet, and was discharged. During the follow-up of 3 months, the patient had no complaints and weighed 80 kg (BMI 25.25 kg/m²).

Discussion

SMA syndrome is a relatively rare clinical condition as a cause of small bowel obstruction. It was first described by Rokitansky in 1842. Wilkie published the first series in 1927; therefore, SMA syndrome is also called Wilkie's syndrome [4]. SMA syndrome is characterized by a compression of the third portion of the duodenum due to narrowing of the space between the SMA and aorta. It is primarily attributed to loss of the intervening mesenteric fat pad [5]. Diagnosis is confirmed by the loss of an angle between the SMA and the abdominal aorta to less than 20°. The distance between the two vessels is also decreased to less than 6 mm (the normal distance is 8–12 mm) [6]. Aortomesenteric angle and distance in our case were 14.6° and 3.99 mm, respectively. Several factors are listed that have an effect on the aortomesenteric angle. The most common one is significant weight loss, which leads to the loss of retroperitoneal fat [5]. Our patient suffered from severe weight loss because of hunger and malnutrition caused by the difficult humanitarian situation due to Syrian war, which made him lose 35 kg (first phase of weight loss due to hunger).

SMA syndrome is most commonly associated with severe, debilitating illnesses, such as malignancy, malabsorption syndromes, AIDS, trauma and burns [5]. Weight loss is not the only factor responsible for SMA syndrome: surgical intervention that distorts the anatomy can also lead to it. Corrective spinal surgery for scoliosis and esophagectomy on some occasions are among the causes. Moreover, congenital short ligament of Treitz suspending the duodenum in an abnormally cephalic position has also been reported in the literature as one of the causes [5]. Females aged between 10 and 40 years are more commonly affected [7]. The predominant clinical symptoms that patients show with vascular compression of the duodenum are nausea, vomiting and postprandial abdominal pain centered at the epigastrium. Our patient complained of postprandial vomiting without abdominal pain. These symptoms can be episodic or persistent and, if persistent as in our case, malnourishment is common, due to narrowing of the duodenal lumen and the resulting vomiting, which made the patient lose an additional 40 kg (second phase of weight loss).

Patients with a history of symptoms suggesting SMA syndrome should undergo further radiographic studies to establish the diagnosis. Upper gastrointestinal series, MCST scan or CT angiography, magnetic resonance angiography, conventional angiography, ultrasonography and endoscopy had all been used for diagnosis [8]. Endoscopy was performed to exclude pyloric stenosis, but we noticed narrowing in the third part of the duodenum. Diagnosis was confirmed by MSCT, which showed compression of the third part of the duodenum between the aorta and the SMA due to decreased distance (3.9 mm) and narrowed angle (14.6°) between these two arteries.

Therapeutic options for SMA syndrome are conservative management or surgical bypass of the obstruction. The goal of medical therapy is to induce weight gain, which would presumably result in an increase in fat at the mesenteric root. Enteral nutrition can be provided using a nasoenteric feeding tube positioned distal to the ligament of Treitz. We applied a nutritional support as a first line therapy through a nasojejunal tube and the patient started gaining weight and postprandial vomiting began to disappear gradually. Failure of the treatment, although a certain period of time cannot be determined, is to be detected by the loss of an angle and distance in our case were 14.6° and 3.99 mm, respectively. Several factors are listed that have an effect on the aortomesenteric angle. The most common one is significant weight loss, which leads to the loss of retroperitoneal fat [5]. Our patient suffered from severe weight loss because of hunger and malnutrition caused by the difficult humanitarian situation due to Syrian war, which made him lose 35 kg (first phase of weight loss due to hunger).

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through the presence of vomiting as the chief symptom and recurrence of the other symptoms. It also indicates the need for surgical treatment for SMA syndrome. If conservative treatment fails, surgical treatment can be performed. A duodenojejunostomy remains the operation of choice to relieve the obstruction, with success rates of up to 90% [3]. In our case, however, the patient responded very well to conservative therapy and there was no need for surgical intervention.

**Conflict of interest**
None declared.

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