Superior Mesenteric Artery Syndrome: An Unusual Cause of Intestinal Obstruction

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Abstract

Superior mesenteric artery (SMA) syndrome is an uncommon cause of proximal intestinal obstruction, frequently occurring in patients who have had an important weight loss. The diagnosis can be difficult and usually is made by exclusion. The most characteristic symptoms are postprandial epigastric pain, fullness, voluminous vomiting and eructation. These symptoms are due to the compression of the third portion of the duodenum against the posterior structures by a narrow-angled SMA and surgical management is necessary. We report a case of SMA syndrome in a 23 year old patient, with a long history (since childhood) of voluminous vomiting, epigastric pain and an important weight loss. We performed small bowel enteroclysis, upper gastrointestinal series and endoscopy, biopsy of gastric and duodenal mucosa, abdominal computer tomography and ultrasonography to establish the diagnosis. Finally, the patient successfully underwent duodenojejunal anastomosis with a postoperative favourable outcome.

Key words

SMA syndrome - chronic duodenal ileus - arterio-mesenteric duodenal compression syndrome

Introduction

Superior mesenteric artery (SMA) syndrome is an uncommon condition thought to be caused by the compression of the third or transverse portion of the duodenum against the aorta, resulting in chronic, intermittent or acute, complete or partial duodenal obstruction (1,2). Since it was first described by Von Rokitansky in 1861, about 400 cases have been reported in the medical literature, but many have doubted its true incidence.

Case report

A 23-year old man presented with a long history, since childhood, of abdominal cramps, voluminous vomiting, once a week, with his own description “I eat cherries in June and I vomit them at Christmas”. There was no history of an eating disorder, nor medication taken and no remarkable family history. Apart from a marked tenderness and distension of the epigastrum and dehydration, the physical examination was normal. He had been in the emergency unit several times and he had received (years ago) treatment for a presumed duodenal ulcer.

On small bowel enteroclysis, a duodenogram showed an important dilatation of the duodenum and a massively distended stomach (Figs.1,2).
The CT scan showed a massively distended stomach and proximal duodenum. The third portion of the duodenum was compressed between the SMA and the aorta. The superior mesenteric vein was also compressed.

The upper GI endoscopy showed marked narrowing of the third portion of duodenum as it passes over the aorta. The duodenal mucosa is similar with gastric mucosa, and the compression is seen at the level of the third segment of the duodenum as a very narrow portion, without any other pathology (Figs.3,4).

The patient was referred for surgery and a duodeno-jejunal anastomosis was performed successfully.

**Discussion**

The SMA usually forms an angle of 45° with the abdominal aorta, and the third part of the duodenum crosses caudally to the origin of the SMA, coursing between the SMA and aorta. Any factor that sharply narrows the aortomesenteric angle causes the compression of the third part of duodenum, resulting in the SMA syndrome. In addition, the aortomesenteric distance in SMA syndrome is decreased to 2-8mm (normal 10-20mm). Many causes have been suggested, as a high insertion of the duodenum at the ligament of Treitz, a congenitally low origin of the SMA and compression of the duodenum caused by peritoneal adhesions, due to duodenal malrotation (3-5).

There are some important etiologic factors which may precipitate the narrowing of the aortomesenteric angle and...
The clinical diagnosis can be confirmed by radiologic studies in 95% of cases (13). The following radiologic criteria have been established for the diagnosis of SMA:
- dilatation of the first and second portions of the duodenum, with or without gastric dilatation;
- abrupt vertical and oblique compression of the mucosal folds;
- antiperistaltic flow of barium proximal to the obstruction, producing to-and-fro movement;
- delay of 4 to 6 hours in transit through the gastroduodenal region;
- relief of obstruction when the patient is placed in a position (prone or knee-chest) that diminishes the drag of the small-bowel mesentery.

CT is also useful in demonstrating both the duodenal distention, the anatomy and the relationships of the superior mesenteric vessels and excluding other pathology.

By the use of selective SMA arteriography against a barium-filled duodenum it is possible to demonstrate extrinsic compression and to measure the aortomesenteric angle and the distance from the aorta.

The initial treatment of the SMA syndrome is generally conservative, with multinutritional support and postural therapy, in patients with a short history and a relatively minor degree of duodenal stasis shown radiologically.

Surgery is indicated if there is a long history of vomiting, progressive weight loss, pronounced dilatation and stasis of the duodenum. Procedures used are: duodeno-jejuno-stomy from the second portion of the duodenum to the jejunum (the best choice), gastrojejunostomy, Roux en Y duodenojejuno-stomy and anterior transposition of the third part of duodenum.

The outcome of the disease is excellent if it is diagnosed early and if the patient receives appropriate therapy.

In conclusion, SMA syndrome is a rare entity with severe consequences if not treated. Appropriate history and physical examination will facilitate the diagnosis.

**References**