

The Role of MSCT in Superior Mesenteric Artery Syndrome (SMAS)

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ABSTRACT: Superior mesenteric artery syndrome (SMAS) is a rare condition caused by compression of the third part of the duodenum between the superior mesenteric artery (SMA) and the aorta, causing symptoms of duodenal outflow obstruction. We report a case of superior mesenteric artery syndrome in a 48-year-old female associated with severe dehydration and vomiting resulting from duodenal compression that necessitated surgical treatment, undiagnosed for 14 years. The diagnosis was performed with MSCT. Diagnostic evaluation revealed compression of the third portion of the duodenum by the SMA with resultant proximal dilatation. The patient successfully had duodeno-jejunal anastomosis.

KEYWORDS: superior mesenteric artery syndrome (SMAS), MSCT, superior mesenteric artery, duodenum, aorta

Introduction

Superior mesenteric artery syndrome (SMA syndrome, also known as Wilkie's syndrome) is a rare condition first described in 1861, by Rokitansky [1]. It occurs when the third (transverse) portion of the duodenum gets entrapped under the superior mesenteric artery. Anatomically, the duodenum passes across the abdominal aorta just below the origin of the SMA. In some cases, various structural anomalies change the angle between the superior mesenteric artery and the aorta (which is normally 45°). This change creates pressure to the duodenum, resulting in to obstruction of its lumen. In the medical literature, there are over 400 cases of SMA syndrome reported, constituting this an unusual cause of upper intestinal obstruction [2].

The syndrome is typically caused by an angle of 6°-25° between the abdominal aorta and the superior mesentery artery, in comparison to the normal range of 38°-56°, due to a lack of retroperitoneal and visceral fat. In addition, the aortomesenteric distance is 2-8 millimeters, as opposed to the typical 10-20 mm [3].

CT scanning is useful in the diagnosis of superior mesenteric artery syndrome and can provide diagnostic information, including aorta-superior mesenteric artery distances and duodenal distension. Also, it can be used to assess intra-abdominal and retroperitoneal fat. CT criteria for the diagnosis of superior mesenteric artery syndrome include an aorto-mesenteric angle of less than 22 degrees and an

aorto-mesenteric distance of less than 8-10 mm. CT can also identify problems that may require intervention, like compression of the left renal vein that results in renal vein thrombosis, pneumatosis or portal venous gas, or an abdominal aortic aneurysm.

Case report

A 48 years old female patient presents with a 16 years old history of stabbing (sharp) pain on the level of diaphragm which propagates to the back between the thoracic and lumbar region and postprandial discomfort. The onset of symptoms is associated with certain types of food or abundant quantity of food and is more pronounced during night time and in a supine position. Pain is relieved with antacids and proton pump inhibitors. Patient is subjected to numerous examinations which result in no major relevant findings (dextral convex scoliosis, hyperplastic stomach polyp, biliary gastritis, liver heamangioma and horseshoe kidneys). She is also put under strict diet avoiding the food that causes the discomfort and after ten years she realizes that the pain is alleviated in a semi supine position, but nevertheless the pain gradually is more intensive. At the age of 48 she underwent a CT scan with contrast which results in the final diagnosis of SMAS. CT examination results with: angle between superior mesenteric artery and the aorta is 18° and the distance between aorta and mesenteric artery at the level of crossing of duodenum (aorto-mesenteric distance) is 7.5mm (Fig.1).

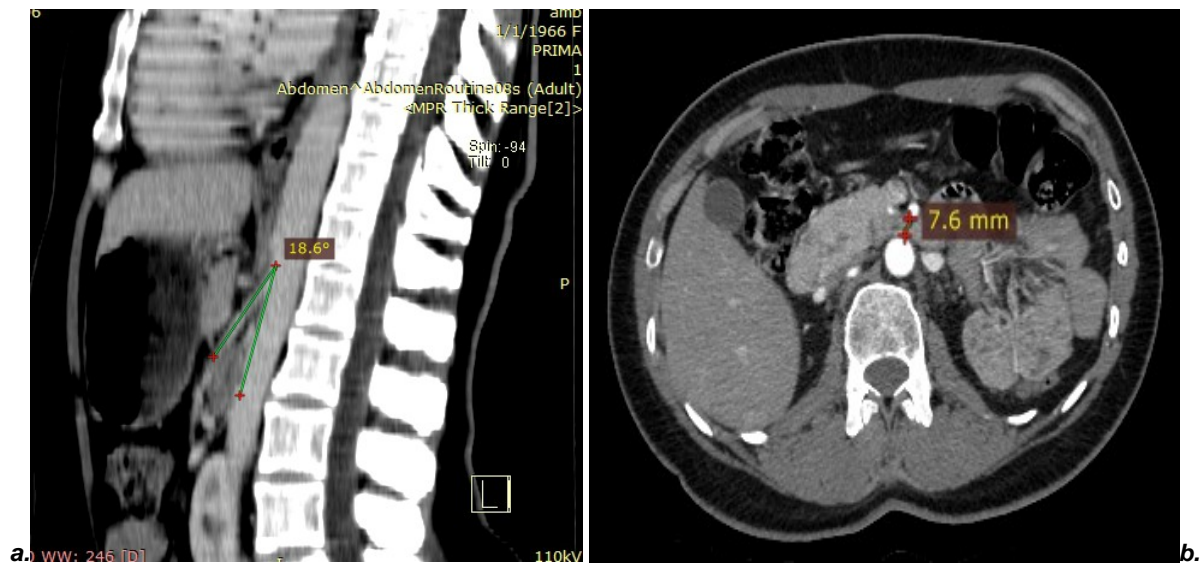


Fig.1. a: Angle between the superior mesenteric artery and the aorta 18° b: Aortomesenteric distance 7-8mm

Diagnostic evaluation revealed compression of the third portion of the duodenum by the

SMA with resultant proximal dilatation of duodenum and stomach (Fig.2).

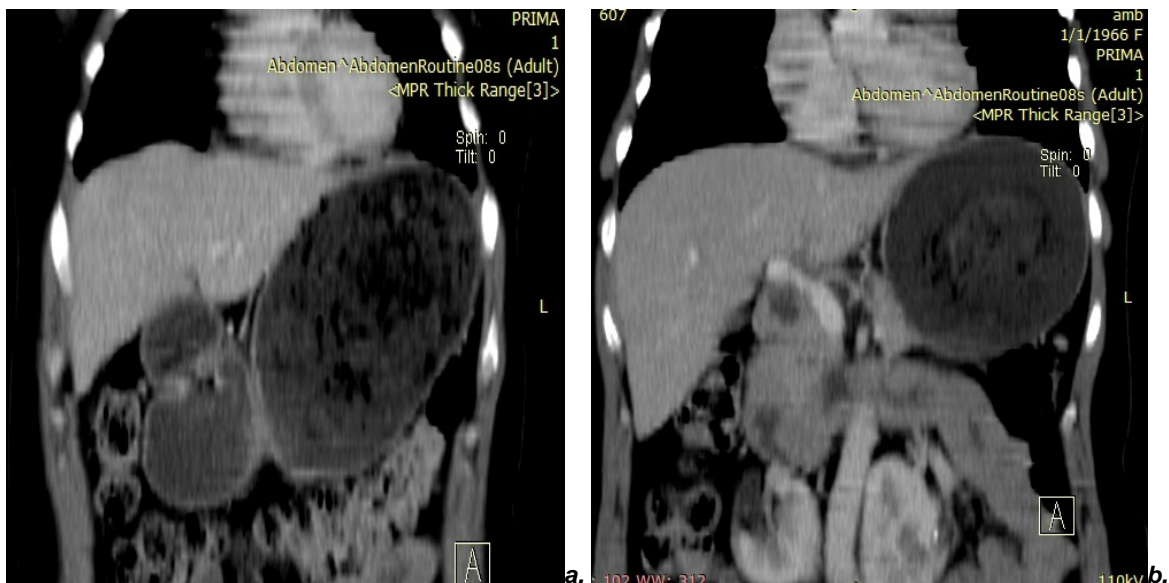


Fig.2.a: Dilatation of stomach. b: Dilatation of prestenotic part of duodenum

Following the diagnosis of illness and considering that in left semi supine position pain alleviates, patient abstained from strict diet that resulted in weight gain, thus in period of one year aorto-mesenteric angle enlarged resulting with fat tissue growth at the mentioned position

(Fig.3). And regardless of this, the overall condition of the patient does not improve therefore a surgical treatment is recommended. The patient successfully had duodeno-jejunal anastomosis in France.

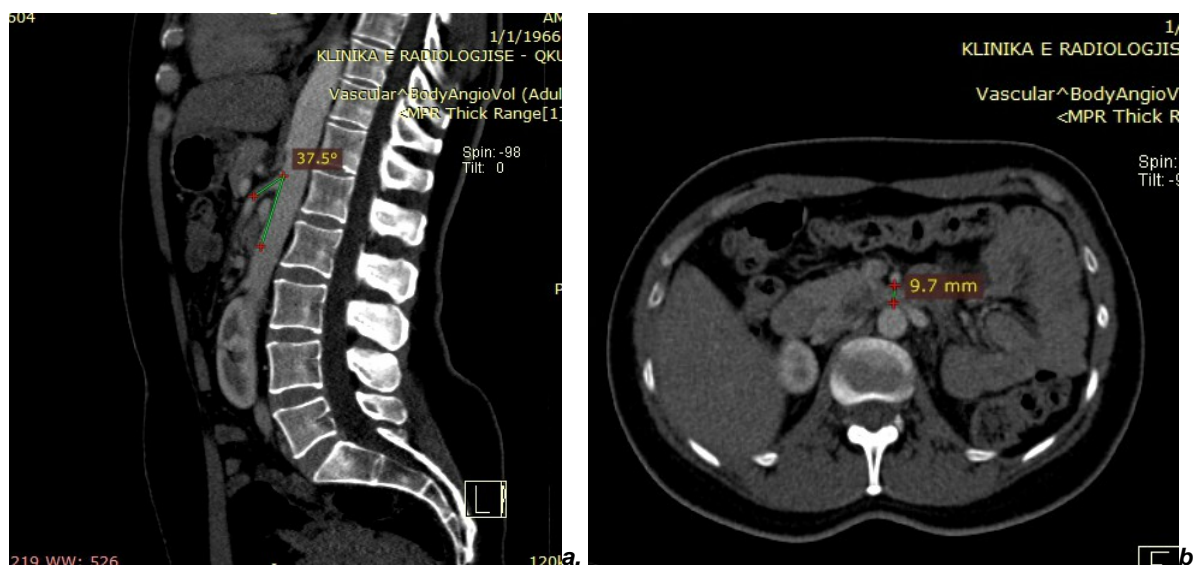


Fig.3. a, b: Aortomesenteric angle enlargement and aortomesenteric distance enlargement after abstained of strict diet

Conclusion

Superior mesenteric artery syndrome is a rare disorder and it can present as an acute upper gastrointestinal tract obstruction. As the condition presents in younger age group and more in females, it can be confused with some eating disorder which can be a cause of delay in diagnosis. It can be associated with high mortality if not diagnosed early. Delay in the diagnosis of SMA syndrome can result in fatal catabolysis, dehydration, oliguria, electrolyte abnormalities, hypokalemia, acute gastric rupture or intestinal perforation, gastrectasia, spontaneous upper gastrointestinal bleeding, hypovolemic shock, aspiration pneumonia, or sudden cardiovascular collapse. CT scanning is

useful in the diagnosis of superior mesenteric artery syndrome and can provide diagnostic information, including aorta-superior mesenteric artery distance and duodenal distension. Conservative management is the rule for acute cases. Surgery is indicated for failure of conservative management. Duodenojejunostomy is the procedure of choice.

References

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