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CAS CLINIQUE

Laparoscopic duodeno-jejunostomy, a minimaly invasive surgery in the management of Wilkie syndrome: a case report

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KEY WORDS

Superior mesenteric artery syndrome, Laparoscopic duodeno-jejunostomy, Wilkie, Minimaly invasive surgery

Abstract

The superior mesenteric artery syndrome (SMAS), also known as Wilkie's syndrome, is a duodenal obstruction caused by the compression of the third part of the duodenum between the superior mesenteric artery (SMA) and the aorta.

This condition often arises due to the disappearance of perivascular fatty tissue, as well as advanced stages of malnutrition and weight loss. Patients typically experience symptoms such as vomiting, fullness, and postprandial epigastric pain.

While initial management involves conservative measures, surgery becomes necessary if symptoms do not improve. Here, we present the case of a 25-year-old man diagnosed with SMAS. Despite undergoing conservative management for three months, the symptoms did not regress. Subsequently, a laparoscopic duodeno-jejunostomy was performed, resulting in an uneventful postoperative period, disappearance of vomiting and epigastric pain, and a weight gain of 14 kg after one year.

Introduction

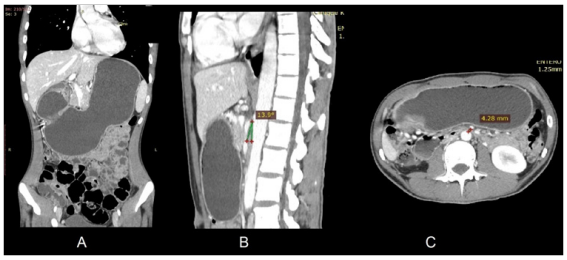
The superior mesenteric artery syndrom “SMAS” is the result of compression of the third part of duodenum by a vascular clamp formed by the superior mesenteric artery and the aorta after disappearance of the perivascular fatty tissue [1-4], often as a consequence hypercatabolism (as is the case of severe burns, major surgery and cancer patients), or severe malnutrition [2].

But also in patients with an anatomical predisposition acquired after surgery causing closure of the aorto-mesenteric angle in surgery to correct spinal deformities [5] or traction on the mesentery in case of ileo-anal anastomoses [2]. The symptoms resulting from this duodenal obstruction associate epigastric pain, postprandial vomiting, nausea, anorexia and weight loss [1,3]. The treatment is initially conservative and medical, but in case of failure surgery is necessary.

Case presentation

This is the case of a 25-year-old male patient with no medical history. He underwent a weight loss diet and lost 27 kg in three months. Subsequently, he presented with epigastric pain and postprandial vomiting. The patient underwent several investigations, including unremarkable endoscopic explorations and upper digestive pacification that revealed gastric and duodenal distension. An abdominal CT confirmed the diagnosis of Superior Mesenteric Artery Syndrome (SMAS) with an aorto-mesenteric angle of 13,9° and an aorto-mesenteric distension of 4,28 mm (**Figure 1**).

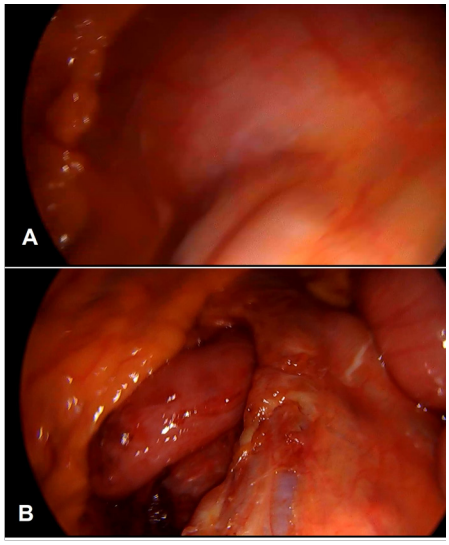
Figure 1. CT-scan.(A)Gastric and duodenal distension, (B) Aorto-mesenteric angle of 13,9 °, (C) Aorto-mesenteric distance of 4,28 mm



The patient was admitted to the gastroenterology department and received parenteral rehydration, prokinetics, and a hypercaloric diet. He was placed in the left lateral position. The placement of a nasogastric tube for decompression was not possible as the patient refused it. After six weeks, there was no improvement in symptoms, and the patient lost an additional 7 kg of weight.

Upon referral to our surgical department, the patient was in an altered general condition, with a blood pressure of 122/72 mmHg and a BMI of 15.39 kg/m². Blood tests revealed hemoglobin at 13.1 g/dl, hematocrit at 36.7%, sodium at 139 mmol/l, creatinine at 8.56 mg/l, total protein at 67 g/l, and albuminemia at 32 g/l. The patient underwent surgery , a nasogastric tube was inserted one hour before the procedure. Laparoscopic exploration revealed a dilated third duodenum, a visible impression of the axis of the superior mesenteric artery, and flattening of the first jejunal loop (**Figure2**). Dissection of the third duodenum was performed, and a laterolateral duodeno-jejunal anastomosis was created, this anastomosis was made at approximately 40 cm away from the dudenojejunal junction using and endo-GIA forceps and the common enterotomy was closed using a 3/0 PDS (Polydioxanone) absorbable suture (**Figure 3**). A 16 F diameter Redon drain was inserted into the abdominal cavity at the end of the procedure, the operative blood loose was estimated to 20 cc.

Figure 2. Laparsocopic view : dilated of the third duodenum (A) before dissection and (B) after dissection



The postoperative course was marked by the disappearance of vomiting, and the nasogastric tube was removed on the first postoperative day. An upper digestive opacification on the third postoperative day showed good permeability of the anastomosis without any leakage (**Figure 4**). On the fourth day, a liquid diet was allowed after the removal of the Redon drain, and the patient was discharged from the hospital on the sixth postoperative day. At 30 days after surgery, the patient no longer experienced vomiting, had reduced epigastric fullness, and had a BMI of 18.76 kg/m². At nine months post-surgery, the patient reported occasional postprandial abdominal pain, but investigations showed no abnormalities, his BMI was 20.22 kg/m².

One year after surgery, the patient's condition has improved. His BMI was 23.2 kg/m^2, he has become a cycling athlete, and he maintains a healthy lifestyle.

Figure 3. A latero-lateral duodenojejunal anastomosis involving the third part of the duodenum and the jejunum, approximately 40 cm distal to the duodeno-jejunal junction

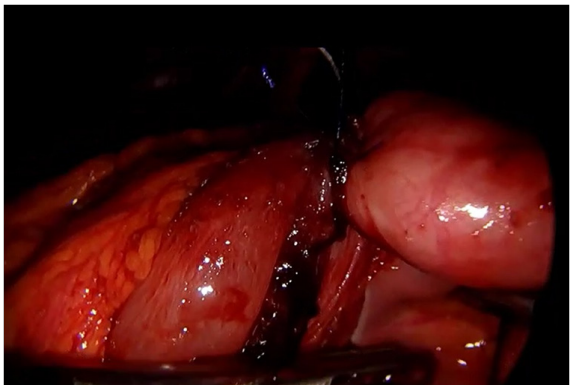
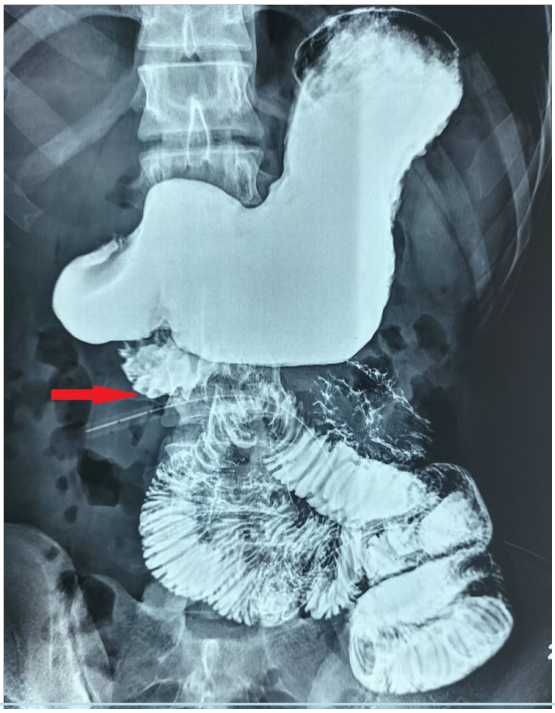


Figure 4. Post operative upper digestive opacification revealing excellent permeability of the anastomosis with no signs of leakage.



Discussion

Superior mesenteric artery syndrome (SMAS) was first described in 1842 by Carl Von Rokitansky. In 1927, Wilkie published the first series of 75 patients, and since then, this clinical condition has been named Wilkie syndrome [1]. SMAS occurs when the duodenum is compressed by the superior mesenteric artery (SMA). Normally, the duodenum is protected by perivascular fatty tissue, but SMAS can occur during rapid weight loss [2- 5]. In our patient, rapid weight loss was evident, as the patient had a critically low BMI upon admission. SMAS manifests similarly to duodenal obstruction, with early postprandial vomiting, abdominal pain, and satiety. In some cases, the symptoms are more chronic, presenting as repeated postprandial fullness and intermittent vomiting [1- 4]. Advances in imaging techniques have made diagnosing this syndrome easier. A CT scan can measure the angle between the SMA and the aorta, which is reduced to 7°-22° compared to the normal range of 25°-60°. Additionally, the aorto-mesenteric distance is reduced to 2-8 mm instead of the normal 10-28 mm [1,3,7]. In our patient, the calculated angle between the SMA and the aorta on the CT images was 13,9°.

Duodenal occlusion leads to acute dehydration and worsens under nutrition, creating a vicious circle that requires treatment [3-4]. The primary treatment for SMAS is conservative and involves placing a nasogastric tube to induce gastric and duodenal decompression. Placing the patient in a strict left lateral position may help reduce the compression and address hydro-electrolyte imbalances. Nutritional support through a high-calorie, high-protein diet administered via a naso-jejunal tube and parenteral support is also initiated [1-4]. The success rate of conservative management is approximately 72%, but there is a 30% risk of recurrence [3,8].

If conservative management fails and symptoms do not improve, surgical intervention becomes necessary. Surgical options include diversion through a gastro-jejunostomy or a duodeno-jejunostomy. Minimally invasive surgery can be employed to execute these procedures [1,3,4]. Another surgical approach involves modifying the anatomical conditions by mobilizing the duodeno-jejunal angle and positioning the jejunum to the right of the SMA after sectioning of the Treitz's muscle. This technique was first described by Strong. The best results have been reported in cases where a duodeno-jejunostomy was performed [1,3,4]. Gastro-jejunostomy effectively addresses gastric distension but has less impact on the duodenum. Patients may report the disappearance of vomiting but persistence of epigastric fullness [9]. Jain et al published an analysis of a retrospective series including 22 patients who underwent laparoscopic duodeno-jejunostomy for superior mesenteric artery syndrome (SMAS). The average hospital stay for these patients was 7 days. Notably, no cases of anastomotic leakage were observed, and all patients experienced relief from postprandial vomiting.

Furthermore, there were no postoperative mortalities, and long-term follow-up revealed an improved quality of life among the patients who remained under observation [9].

Conclusion

In cases of Wilkie's syndrome, conservative approaches are often the first line of treatment, but when they fail, laparoscopic duodeno-jejunostomy shows promise in providing a high rate of treatment success, long-term relief, and improved quality of life for patients.

Conflicts of interest

The authors have no conflicts of interest to declare.

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