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Gastric perforation on a superior mesenteric artery syndrome: Exceptional case and two-stage treatment

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Abstract
Superior mesenteric artery syndrome results from compression of the third duodenum between the upper mesenteric artery and the aorta. It determines an acute or chronic high intestinal obstruction clinical presentation.
We report the case of a 37-year-old Moroccan woman, without any particular history, admitted in a table of abdominal contracture with sepsis, abdominal CT scan confirmed a gastric perforation on a mesenteric aorto forceps.
Treatment was initial damage control and gastroenteric-anastomosis after hemodynamic stabilization.

Keywords: Superior mesenteric artery syndrome, gastric perforation, damage control

Introduction
Wilkie's syndrome, or superior mesenteric artery syndrome (SMAS), is an infrequent condition that manifests itself primarily through vomiting. Its pathophysiology is explained by the narrowing space between the superior mesenteric artery and the aorta following a decrease in perivascular fat by different causes.
The clinical presentation is generally chronic but a gastric perforation immediately remains an exceptional case.
Treatment is based on nasogastric tube, rehydration, re-nutrition, and in case of failure surgery.

Case report
This is a 37-year-old patient with no specific history who consulted for acute abdominal pain associated with uncountable vomiting. The whole evolved in a context of alteration of the general state.

Clinical examination on admission
Finds a patient conscious, body temperature was 38.5° C, tachycardia at 120 bpm, blood pressure = 90/60mmhg, and tachypnea at 28 cpm. The abdomen had a generalized defense.

Biologically
Leukocytosis at PNN (15000), hemoglobin=14g/dl, hemostasis test is correct, functional renal failure (Urea=1.6 and blood creatinine=36), PCR=242 mg/l.

An injected abdominal scanner (After a nephrologist opinion) showed
High intestinal occlusion (Esophageal distension and gastro duodenal with a stomach arriving in the hypogastric region and a D2 measuring 53mm) on probable superior mesenteric artery syndrome (SMAS), complicated by peritonitis on gastric perforation (Solution of the continuity of the small curvature, effusion of medium abundance, and a peritoneal contrast) (Figure 1).

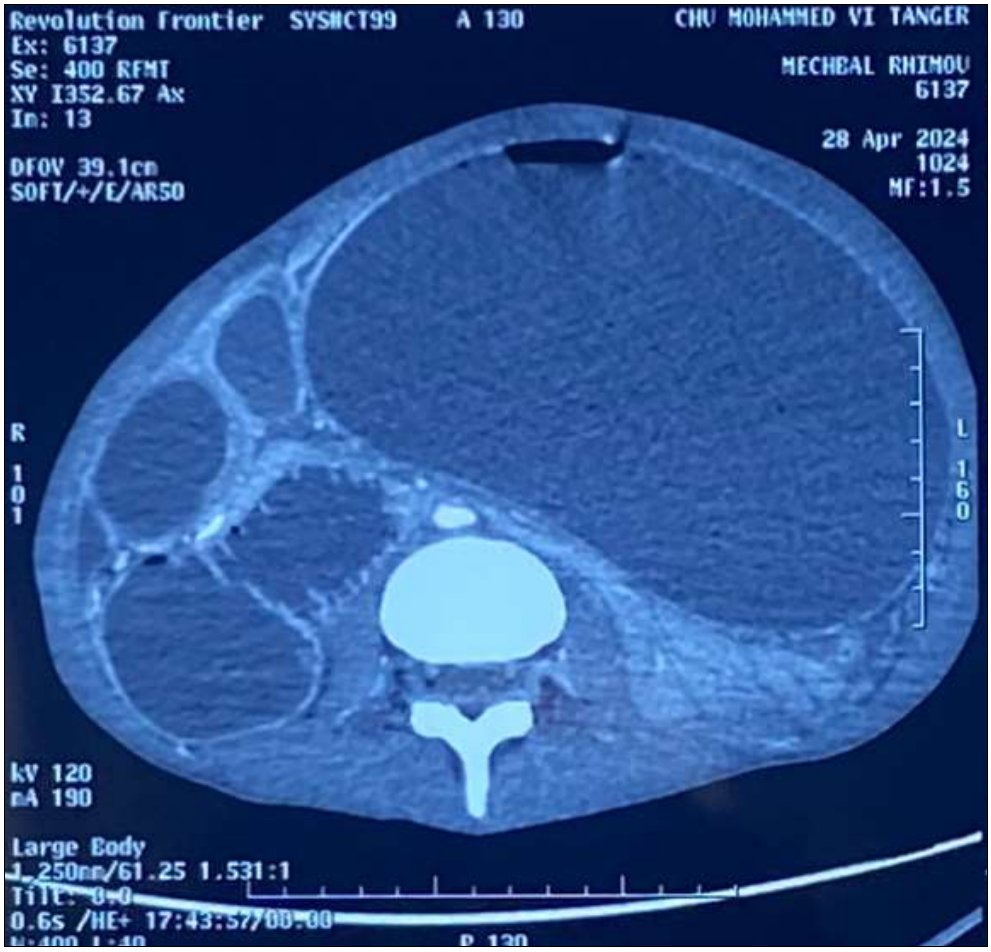

Fig 1: Cross section of an abdominal CT with injection showing duodenogastric distension and pneumoperitoneum

Angle between aorta and SMA = 18.2° and the distance between its two structures = 3mm (Figure 2).

Fig 2: Frontal slice of an abdominal CT scan with injection showing calculations of angle and distance between aorta and SMA and gastric distension

Our policy was to get the patient to the operating room after she was in good condition.
Intraoperative exploration finds perforations on the gastric body (Figure 3).

Fig 3: image per operation showing the perforation in the gastric body

We carried out an initial damage control made of washing, suturing of perforations, and drainage due to the hemodynamic instability per operation of the patient.
After 24 hours of resuscitation, we took the patient for subtotal gastrectomy and an Omega anastomosis on the gastric stump leaves.
The biological clinical course was favorable and the patient left the hospital after 10 days of hospitalization.
Pathological examination came back in favor of chronic interstitial antro-fundic gastritis, moderate activity, follicular character, not atrophic, HP+, and absence of signs of malignancy. The patient was put on Pylera and the control by serology and respiratory test confirmed the eradication of HP.

Discussion

Mesenteric clamp syndrome, Wilkie syndrome, superior mesenteric artery syndrome, duodenal aorto-mesenteric compression syndrome [1], is a rare entity, occurring preferentially in young patients aged 17 to 39 years of female sex [2, 3]. Its prevalence is 0.013% to 0.78% [3].
Its pathophysiology is explained by the narrowing space between SMA and aorta (Less than 8 mm and an angle less than 20°) following a decrease in perivascular fat by severe malnutrition, hypercatabolism, surgery of spinal deformation, mesenteric traction (ileoanal anastomosis for example) or anatomical variants of the Treitz ligament or the origin of SMA [4, 5].
Clinical expression of the syndrome can take two forms: chronic (92%) and acute (7%) [4], made by vomiting, epigastralgia and weight loss [3].
The acute form achieves a severe high occlusion, with acute expansion of the stomach, which can be life-threatening [3].
The diagnosis is based on the CT scan which may or may not be coupled with an ingestion of water (or iodized contrast agent). It shows a localized dilatation interesting the gastric and duodenal segments located upstream of the aorto-mesenteric clamp. It allows accurate measurement of aorto-mesenteric space and angle [6].
The treatment of SPAM is primarily medical, and consists of the establishment of a nasogastric probe, putting the patient in the left lateral position, and especially compensating for the hydroelectrolytic disorders and establishing a double high-calorie diet, enteral by a naso-jejunal and parenteral tube [2-7] with a risk of recurrence of 30% [8]. Surgical treatment should only be considered after failed medical treatment [1, 9].
Several techniques have been proposed. Strong's intervention of lowering D4 after a section of the Treitz ligament was proposed in children but with a recurrence rate of 20% [9]. Duodenojejunal or gastrojejunal anastomosis remains the intervention of choice in adults [10].
Damage control is applicable in any situation where the patient may cause per-operative problems of death [11].

Conclusion

The superior mesenteric artery syndrome is a rare, sometimes unknown pathology. A key diagnostic test is the injected abdominal CT scan. Medical treatment is the primary option. If it fails, surgical treatment should only be considered, without neglecting the principle of damage control, which can be an effective tool to pass the severe course of patients with hemodynamic instability.

Authors' contributions

All the authors have actively participated in the redaction, the revision of the manuscript, and provided approval for this final revised version.

Informed consent

Written informed consent was obtained from the patient.

Conflict of interest

Authors have no conflicts of interest to declare.

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