



Peritonitis by Gastric Ulcer Perforation Associated with Mesenteric Infarction on Situs Inversus: Case Report

**M. Bouali¹, A. Lamnaouar^{2*}, A. Ettaoussi³, M. Asmar^{1,2,3}, A. Elbakouri³,
F. Z. Bensardi^{1,2,3}, K. Elhattabi^{1,2,3} and A. Fadil^{1,2,3}**

¹Department of General Surgery, University Hospital Center Ibn Rochd, Faculty of Medicine and Pharmacy, Hassan II University, Casablanca, Morocco.

²Emergency Department, University Hospital Center Ibn Rochd, Faculty of Medicine and Pharmacy; Hassane II University, Casablanca, Morocco.

³Department of Visceral Surgery, University Hospital Center Ibn Rochd, Faculty of Medicine and Pharmacy, Hassan II University, Casablanca, Morocco.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Complete situs inversus is a rare embryological anomaly characterised by complete inversion of the positions of thoracic and abdominal organs;

Acute mesenteric infarction and gastric ulcer perforation are surgical emergencies with serious consequences. The association of these two pathologies remains one of the rare entities whose mechanism remains subject to multiple hypotheses.

The present article reports the case of 78 year old patient who was admitted with peritonitis due to hollow organ perforation.

The abdominal scan showed a large pneumoperitoneum associated with signs of digestive distress with inversion of the position of the abdominal organs (liver on the left, spleen on the right).

Surgical exploration revealed the presence of a 1.5 cm pyloric perforation associated with necrosis

*Corresponding author: Email: Lamnaouar07@gmail.com;

of the distal small intestine and coecum with inversion of the position of the abdominal organs (liver and gall bladder on the left, spleen and stomach on the right and coecum and appendix located at the level of the left iliac fossa) achieving a complete situs inversus

Keywords: *Situs inversus; gastric ulcer perforation peritonitis; mesenteric infarction.*

1. INTRODUCTION

Complete situs inversus is an extremely rare syndrome characterised by an inverted positioning of the thoracic and abdominal organs giving a mirror image.

It results from an abnormal rotation of the heart tube and the primitive intestine during embryogenesis, of unknown mechanisms.

Peritonitis by perforation of peptic ulcer and mesenteric ischemia are two absolute medical and surgical emergencies, whose evolution is burdened with heavy sequelae and a very high morbi-mortality.

We report the case of a complete situs inversus in a patient operated for peritonitis caused by perforation of the peptic ulcer associated with a mesenteric infarction and we discuss in the light of the literature the epidemiological, anatomical and embryological characteristics of the complete situs inversus as well as the possible hypothesis explaining the concomitant occurrence of an acute mesenteric ischemia and a gastric ulcer perforation

2. CASE PRESENTATION

This was a 78 years old male patient, chronic smoker, who presented five days previously to his admission with generalized abdominal pain, associated with vomiting, without externalized digestive hemorrhage, evolving in a context of altered general condition.

Clinical examination on admission found a confused patient, haemodynamically and respiratorily unstable (BP: 90/50 mmHg, HR: 99 Bpm, RR: 24C/min, SPO2: 92%, with generalized abdominal guarding, and positive Douglas cry on rectal examination.

The abdominal CT scan showed the presence of a pneumoperitoneum with a medium-sized peritoneal effusion (compatible aspect with peritonitis by perforation of a hollow organ) associated with signs of digestive suffering (bowel parietal pneumatosis) with the inversion

of the position of the abdominal organs (liver on the left and spleen on the right).

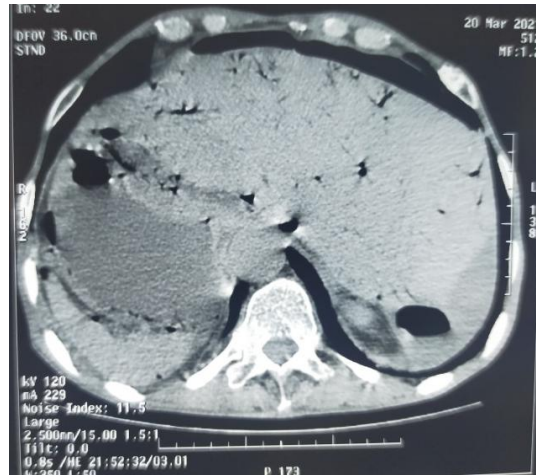


Fig. 1. Axial slide of abdominal CTscan showing the liver in the left side, spleen and stomach in the right side, with pneumoperitoneum and portal venous gas

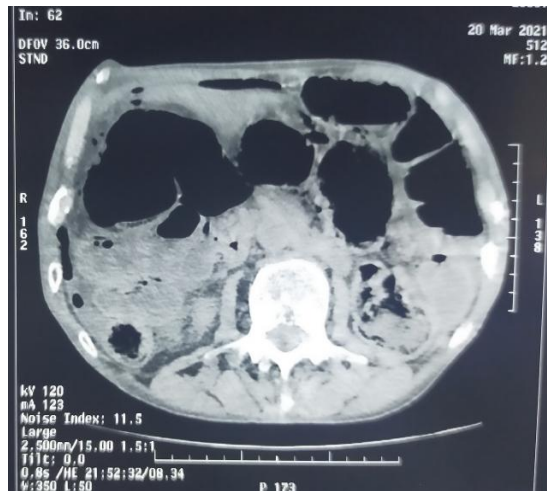


Fig. 2. Axial slide of abdominal CTscan showing the bowel parietal pneumatosis

The operation was an intestine and coecal resection removing 1.80m of the necrotic small bowel and the coecum with ileocolostomy and

suture of 1.5 cm pyloric perforation in plasty, with an abundant peritoneal lavage.

Surgical exploration showed the reversal of the position of the abdominal viscera with the

presence of purulent peritoneal effusion with several false membranes, and the presence of a 1.5 cm pyloric perforation and necrosis 1.80 metre stripe from 1.30 metre duodenojejunal flexure extended to coecum.

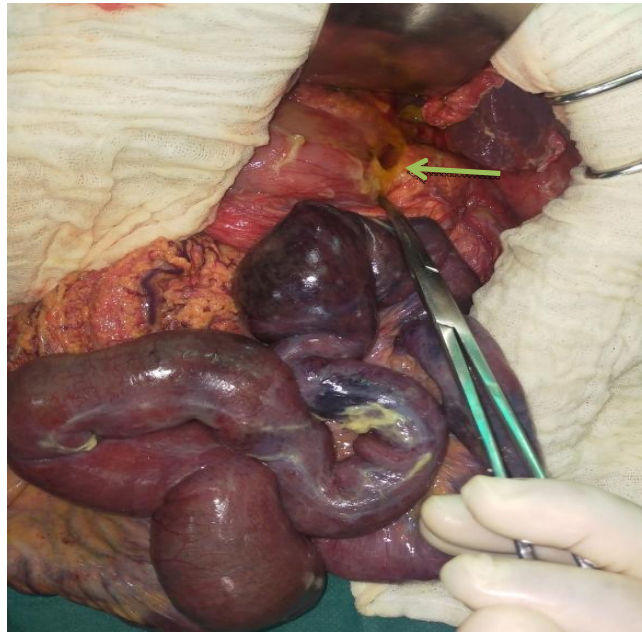


Fig. 3. Small bowel necrosis, with gastric ulcer perforation (arrow)



Fig. 4. Coecum and appendix in the left iliac fossa (arrow)



Fig. 5. The gallblader and the liver on the left side (arrow)



Fig. 6. The duodenum and the pancreas on the left side (arrows)

The pathological findings of the ileocolic resection specimen showed ischaemic and haemorrhagic intestinal necrosis with no obvious sign of specificity.

On the biopsy of the edges and the mucosa of the gastric perforation, the histological

examination revealed the presence of a chronic inflammatory remodelling with ulceration stigmata.

The patient was admitted during three days postoperative in the intensive care unit, under 6 mg of noradrenaline. The patient was in septic

shock, and despite resuscitation measures, the patient died due to cardiopulmonary arrest.

3. DISCUSSION

Situs inversus totalis (SIT), also known as situs inversus viscerum or situs transversus, or opposites, is a rare anatomical variation (1 in 10,000 people) defined by a mirror-like positioning of the thoracic and abdominal organs [1,2].

It results from an abnormal rotation of the heart tube and the primitive intestine during embryogenesis.

In the situs inversus totalis, the cardiac apex, spleen, stomach, descending colon, are right-sided structures [3,4]. The liver, gallbladder, ascending colon, and inferior vena cava are left-sided structures [3,4].

Situs inversus abdominis, or (situs inversus with levocardia) or left-sided heart is a condition with right-left inversion limited to the abdomen [5,6].

The aetiology of situs inversus is poorly understood [7]. However, there is evidence to suggest the intervention of familial genetic factors [8]. Mainly related to changes in chromosome structure and number [9].

Other ethiopathogenetic factors implicated in situs inversus are maternal diabetes, cocaine abuse, retinoic acid exposure, conjoined twinning, consanguinity and familial character (multiple inheritance patterns) [1-5,10].

Some congenital anomalies that may be associated with the situs anomaly include congenital heart disease and splenic malformations [2,11].

Acute intestinal ischaemia is secondary to occlusive vascular insufficiency, by arterial, venous embolism, thrombosis or non-occlusive by vasospasm and then evoked by a context of low systemic flow in the territory of the splanchnic arteries or toxic (vasoconstrictors) [12,13].

Peritonitis due to ulcer perforation is a frequent and serious complication of peptic ulcer disease, responsible for a mortality rate of 6% to 14%.

Chronic helicobacter pylori gastritis and the use of drugs such as aspirin and non-steroidal anti-

inflammatory drugs are the two main causes incriminated in the genesis of PUD

The role of smoking in ulcer formation is discussed, but it is thought to slow down the healing process.

In our patient, two hypotheses can explain the simultaneous discovery of these two emergencies:

The first hypothesis is that our patient had a chronically evolving gastric ulcer which was complicated by perforation and peritonitis giving rise to septic shock with reduction in blood flow in the splanchnic territory leading to acute ischaemia of the small intestine.

The second hypothesis is that our patient suffered from acute ischaemia of the small intestine secondary to thrombosis of the mesenteric vessels, and the evolution was marked by the occurrence of a perforated ulcer linked to stress.

If we analyse the clinical data and the perioperative findings as well as the histological results, (the presence of a stigma of chronic ulceration) will be more in favour of the first hypothesis, which assumes that our patient had a chronic gastric ulcer that perforated, giving rise to peritonitis with haemodynamic failure responsible for the acute mesenteric ischaemia

4. CONCLUSION

situs inversus totalis is a rare condition affecting approximately 0.01% live births it involves complete transposition of the thoracic and abdominal viscera.

The genetics of situs inversus is complex and there are syndromic associations (congenital cardiac defects in 3-5% and Kartagener syndrome with bronchial ciliary dyskinesia).

Acute mesenteric ischaemia and gastric ulcer perforation are surgical emergencies with serious consequences and a very high mortality. The association of these two pathologies remains one of the rare entities whose mechanism remains subject to multiple hypotheses.

INTEREST OF THE QUESTION

Because the complete situs inversus is a rare syndrome and source of many diagnostic errors

and therapeutic delays. The association of a gastric ulcer perforation and mesenteric infarction is an exceptional entity requiring a heavy management.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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