

Total volvulus of the small intestine due to rotation anomaly: a rare cause of occlusion (case report)

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Abstract: *Congenital anomalies of the intestine result from a malrotation of the primitive gut tube during embryonic development. There are two types: complete common mesentery, where the entire small intestine is on the right and the colon is on the left; and incomplete common mesentery, where the root of the mesentery is short, exposing the patient to the risk of mesenteric volvulus. Total small bowel volvulus due to rotation anomaly remains a relatively rare and little-known pathology in adults, resulting in a life-threatening prognosis following late or even inappropriate treatment due to the delay or absence of diagnosis. In this case report, we will highlight this complication and review the embryological principles of rotation of the primitive intestine, diagnosis, methods and principles of treatment.*

Introduction

Rotational bowel disease (RBD) is a congenital malposition of the gastrointestinal tract, the main complication of which is total small bowel volvulus (1) in cases of incomplete common mesentery.

It may be discovered in a wide variety of circumstances, but is most often diagnosed at the complication stage.

Observation

A 26-year-old patient with no previous history was seen in the emergency department with right iliac fossa pain that had been present for 4 days, vomiting and cessation of bowel motion and gas. The patient was afebrile and haemodynamically and respiratorily stable.

The abdominopelvic CT scan with injection showed a cecum in a median position, a right-sided bowel structure and a left-sided colonic structure, the mesenteric artery to the right of the vein, and mesenteric whirl sign of the first jejunal intestines around the superior mesenteric arterial axis, leading to the conclusion of a mesenteric and small bowel volvulus on incomplete common mesentery with no sign of digestive distress ([Fig. 1](#)).

Emergency management was surgical with a median laparotomy confirming the radiological diagnosis ([Fig 2](#)). A devolution followed by an appendectomy and then positioning in a complete common mesentery were performed.

No problems were reported in the postoperative follow-up.

Discussion:

The segment of the primitive intestine involved in intestinal rotation is called the umbilical loop. This part corresponds to the midgut, extending from the second duodenum to the right third of the transverse colon, vascularised by the superior mesenteric artery (SMA). The AMS therefore represents the axis around which intestinal rotation (1) takes place between weeks 5 and 10 of embryonic development, with the umbilical loop outside the abdominal cavity. Under the influence of transcription factors such as FOXF1, PITX2 and ISL1, as well as homeotic genes such as IRX3, the loop begins its counter-clockwise rotation. It gradually integrates into the abdominal cavity, completing its rotation until it is permanently positioned inside the abdomen(2-3). Premature interruption of the 180° intestinal rotation results in the duodenojejunal angle being positioned to the right of the vertebral column and the ileocaecal junction becoming fixed in the subhepatic region. In this 180° position, the first jejunal loop and the last ileal loop are close to the superior mesenteric artery (SMA) and very close to each other. This results in an extremely short mesentery root and a small intestine "pedicled" on its superior mesenteric vascular axis. Sometimes, there is even a congenital fusion of the meso between the first and last small intestines, known as Pellerin's mesenteric fusion(4). This

configuration, known as "incomplete common mesentery", presents a high risk of volvulus because the root of the mesentery is short.

The diagnosis of small bowel volvulus can be made in a wide variety of circumstances, often involving acute intestinal obstruction (5).

Abdominopelvic CT with contrast injection [6-7] is the reference examination for the diagnosis of small bowel volvulus on RA in adults. Initially described by Fischer (8) in 1981, the *whirlpool sign* visible on CT is now recognised as pathognomonic for small bowel volvulus.

Although some authors have suggested various technical variants, such as fixation of the caecum [9] or mesentery [10], or even positioning with pexy of the intestine in a "normal" position at 270° [11], Ladd's procedure remains to this day the reference treatment for small bowel volvulus on incomplete common mesentery, in both adults and children. This procedure consists of five stages: detorsion of the mesentery, release of the cecum, release of Treitz's angle, appendectomy and placement in complete common mesentery to prevent recurrence(1).

Conclusion:

Total small bowel volvulus due to rotational abnormalities remains a relatively rare and little-known pathology in adults.

Preoperative diagnosis of total small bowel volvulus is best made by CT scan with injection.

This is a surgical emergency leading to a life threatening situation if the diagnosis is delayed or missed.

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Figures:

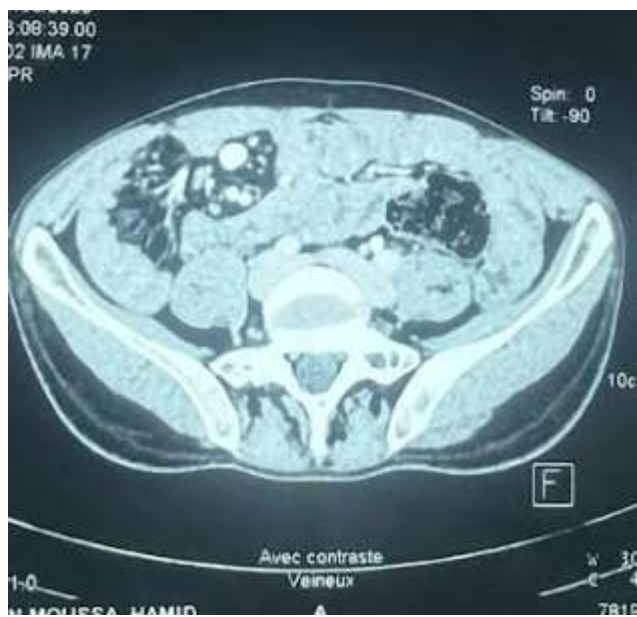


figure 1 : abdominopelvic CT scan with injection showing Mesenteric and jejunal volvulus on incomplete common mesentery.

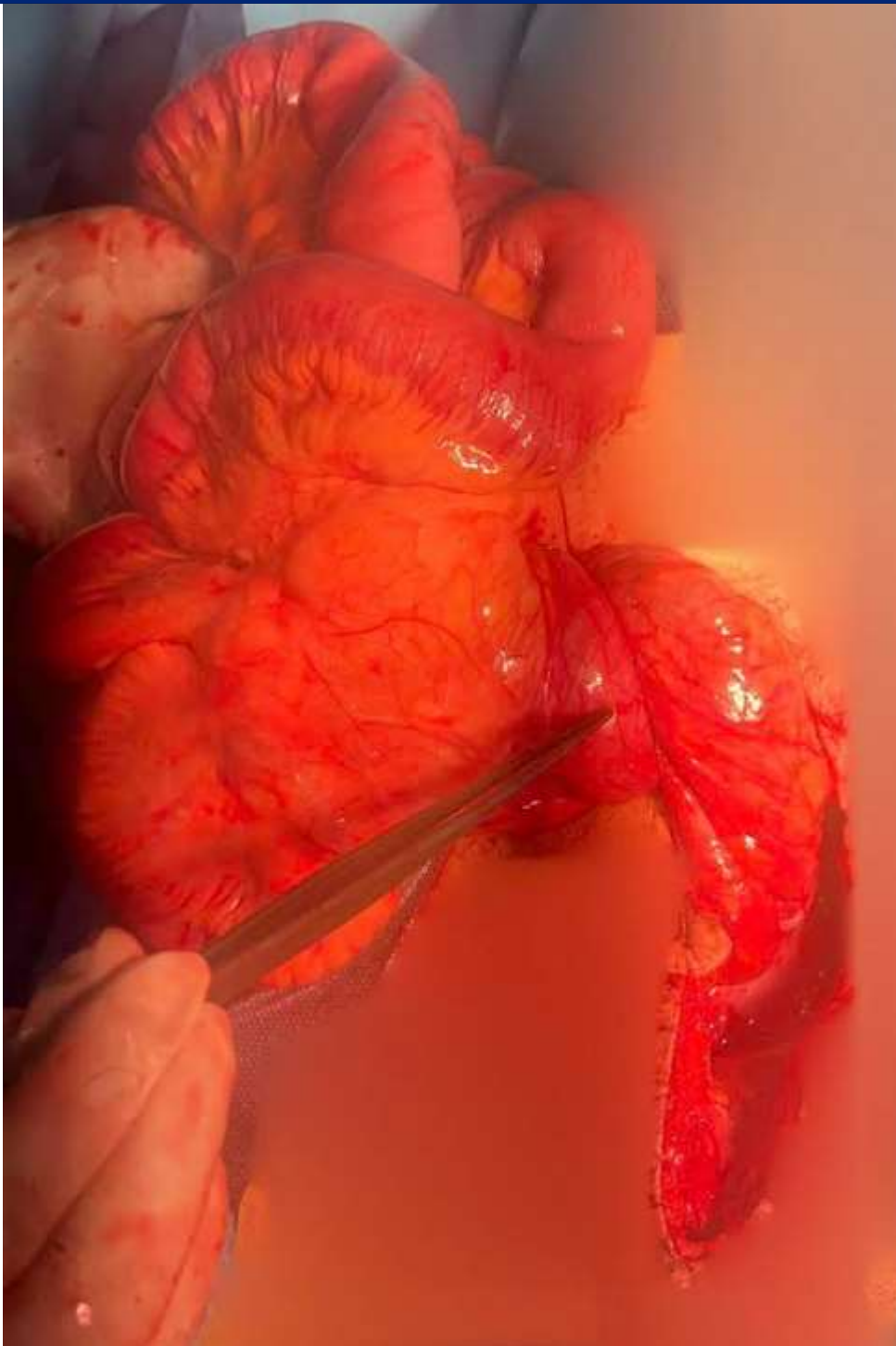


figure 2 : Intraoperative image showing dilated small bowel loops and midgut volvulus