Case report

Common Mesentery in Small Bowel Volvulus - A Case Report

Abstract

The common mesentery is a very rare anomaly of digestive tube rotation in adults. It exhibits highly variable manifestations ranging from abdominal discomfort to acute intestinal obstruction, which presents the most dreaded complication among these manifestations. Nowadays, although the focus is on the progress of radiological imaging methods, the final diagnosis remains preoperative.

We report the case of a 34-year-old woman with a history of transit disorders, who was admitted to surgical emergencies with a presentation of high digestive obstruction lasting for 4 days. An abdominal X-ray revealed central air-fluid levels and a wide pattern, complemented by an abdominopelvic CT scan showing a volvulus of the small intestine likely due to adhesions. Intraoperatively, an obstruction of the small intestine was discovered with involvement of the complete common mesentery.

Keywords: Volvulus, common mesentery, intestinal obstruction, small intestine, case report

INTRODUCTION:

The common mesentery anomaly represents a congenital condition characterized by a complete or partial rotation of the digestive tube by an angle of 180° [1]. Frequently, affected individuals remain asymptomatic, and the anomaly is often incidentally discovered; its occurrence in routine surgical practice is notably infrequent, accounting for a mere 0.2% to 0.5% of cases [2].

However, instances involving a complete common mesentery may occasionally manifest as acute progressive complications, particularly acute small bowel obstruction. Due to the lack of proper mesenteric fixation to the retroperitoneum, such cases can further develop into total small bowel volvulus, intussusception, or megacolon [3].

The initial diagnostic approach is frequently facilitated by the use of medical imaging, which assumes a pivotal role in accurate diagnosis. In standard clinical practice, the diagnostic process commences with an Abdominal X-ray (AXR) without prior preparation, revealing air-fluid levels that exhibit a greater width than height. These levels are centrally located and indicative of a small bowel obstruction syndrome. Subsequently, a Computed Tomography (CT) scan is recommended to corroborate the etiological diagnosis of the occlusion. The CT scan showcases a characteristic "whirl" sign, which is widely considered pathognomonic by a majority of researchers [4]. Notably, cases involving total small bowel volvulus associated with a complete common mesentery mandate urgent surgical intervention, necessitating prompt surgical exploration.

Comment [FH1]:
These intestinal rotation abnormalities can lead to serious and sometimes fatal complications, which generally occur during the neonatal period or at pediatric age. The prevalence of these congenital malformations in adulthood is estimated to be around 0.2% to 0.5%; age at which they very often remain asymptomatic and therefore undiagnosed

CASE REPORT

A 34-year-old female presented to the emergency department with severe colicky abdominal pain accompanied by intermittent episodes of nausea and vomiting. The patient reported a history of constipation persisting for over 2 months. She indicated that her abdominal pain initially started as moderate discomfort but had progressively intensified to become unbearable, often alleviated temporarily by postprandial vomiting. Throughout this period, the patient remained afebrile, and her overall general condition was well-maintained.

Upon physical examination, the patient exhibited normal breathing patterns, but her abdomen appeared distended and tender upon palpation. Notably, hernial orifices were found to be free of any obstruction. A rectal examination revealed an empty rectal ampulla. Laboratory investigations, including a complete blood count (CBC), C-reactive protein (CRP) levels, and ionogram, revealed hyperleukocytosis and elevated markers of systemic inflammation. An urgent abdominal-pelvic Computed Tomography (CT) scan was performed, revealing proximal small bowel distension accompanied by a whirl-like image consistent with volvulus (Figure 1, Figure 2). The scan further demonstrated a vertical orientation of the superior mesenteric artery and vein (Figure 1) and an abnormal positioning of the small bowel to the right, whereas the cecum and appendix were observed in the left iliac fossa. Based on the comprehensive analysis of the CT images, a preliminary diagnosis of incomplete common mesentery-associated small bowel volvulus was established. This diagnosis was subsequently confirmed during surgical exploration (Figure 3).

Following a brief period of stabilization, the patient was urgently taken to the operating room. The surgical exploration revealed extensive distension and compromised perfusion of the entire small bowel. A twist was identified in both the first jejunal loop and the terminal ileal loop (Figure 3). Notably, the cecum was positioned in the left iliac fossa, adhering to the wall due to a Ladd's band (Figure 3). The surgical procedure involved counterclockwise detorsion followed by immediate reperfusion of the small intestine. Subsequently, corrective surgery was performed to address the embryological rotational anomaly according to the Ladd's procedure. This entailed releasing adhesions, converting the incomplete common mesentery into a complete one to prevent recurrence, and concluding with a precautionary appendectomy (Figure 3). The patient's postoperative course was uneventful, and she was discharged after a 4-day hospital stay.

DISCUSSION

The common mesentery anomaly arises from a congenital malformation due to an anomalous rotation of the primitive umbilical loop around its axis, resulting in a shared mesentery for all portions of the intestine. This malformation can manifest as an interrupted 180° intestinal rotation, leading to a position where the ileocecal junction attaches in the subhepatic region [5]. If this attachment occurs adjacent to the duodenum, a commonly encountered entity known as the "Ladd's Band" forms, connecting the cecum to the right superolateral abdominal wall [6]. This well-recognized peritoneal band can cross the second part of the duodenum and may cause high-level acute intestinal obstruction in an otherwise asymptomatic adult patient. In some instances, a congenital fusion between the mesentery of these two intestinal loops, termed "Pellerin's mesenteric fusion," can also exist [7].

In the 180° rotation position, the mesenteric root becomes extremely short, and the entire small intestine is "pedicled" on its superior mesenteric vascular axis. This configuration, referred to as "incomplete common mesentery," carries a high risk of total small bowel volvulus due to the shortness of the mesenteric root and its lack of attachment [8].

The common mesentery anomaly remains a seldom-encountered condition in routine surgical practice [9]. Its exceptional occurrence in adulthood, coupled with diverse symptomatology, often leads to diagnostic and therapeutic delays and errors, contributing to the fact that most cases are posthumously diagnosed [10].

The diagnosis of complete common mesentery-associated small bowel volvulus can arise in various contexts. The incomplete common mesentery is rarely symptomatic and is often discovered incidentally during radiological examinations performed to investigate other known conditions [11]. More rarely, it can be discovered during laparoscopic surgery, such as following cholecystectomy [12], appendectomy [13], or obesity surgery [14]. However, it can also present with recurrent abdominal pain, sometimes accompanied by alterations in bowel habits [15].

Total small bowel volvulus represents the most dreaded complication of this congenital anomaly, necessitating urgent diagnosis in response to an acute intestinal obstruction or even shock, which can lead to fatal outcomes without appropriate intervention.

The diagnosis is predominantly facilitated by contrast-enhanced Computed Tomography (CT) scans, which serve as the reference examination and gold standard for diagnosing total small bowel volvulus associated with incomplete common mesentery in adults [16]. The CT scan serves as the gold standard for positive, topographical, and severity-based diagnoses. Technically, it involves an abdominal-pelvic scan with contrast enhancement. The "whirl" sign appears to be pathognomonic for the majority of researchers [17]. First described by Fisher [18] in 1981 as the whirl-like pattern, it corresponds to the

mesenteric twist visualized in the midline, anterior to the aorta and at the level of the superior mesenteric artery. This is where the superior mesenteric vein and proximal jejunum become "entwined." The contrast injection highlights the verticalization or inversion of the superior mesenteric vessels, with the vein positioned above or to the left of the artery [19], although this sign is not always consistent. The thickness of this whirl mass is believed to correlate with the degree of volvulus rotation; however, a more precise assessment of the degree of rotation is achieved by calculating the number of twists made by the mesenteric vessels [20].

An understanding of the anatomy of the incomplete common mesentery is imperative for intraoperative diagnosis and comprehension of the principles underlying surgical correction. In the typical form of the 180° intestinal rotation, known as the incomplete common mesentery, the duodenum is truncated, ending after D2 with the Treitz angle positioned to the right of the spine. The cecum is found in the subhepatic position, and the mesenteric root is very short, centered on the superior mesenteric vascular axis, often resulting in a pedicle-like appearance [21]. In the context of acute obstruction, the primary choice is a midline laparotomy, and the Ladd's procedure remains the standard treatment for both adults and children [22]. This procedure involves a midline laparotomy, followed by counterclockwise detorsion of the volvulus, followed by releasing the bands responsible for the shortening of the mesenteric root. This is succeeded by fixing the intestine to the complete common mesentery to prevent recurrence. The procedure also includes a precautionary appendectomy [23]. The prognosis is generally favorable, contingent on timely intervention before the onset of intestinal compromise.

CONCLUSION

Advancements in medical imaging, particularly contrast-enhanced Computed Tomography (CT) scans, have revolutionized the diagnostic process, enabling accurate identification of characteristic signs like the "whirl" pattern. This imaging modality plays a critical role in guiding surgical interventions.

The surgical approach, represented by the Ladd's procedure, remains the cornerstone of treatment. By addressing both the volvulus and the anatomical anomalies associated with incomplete common mesentery, this procedure offers a comprehensive solution to prevent recurrence and alleviate potential complications.

Although the incomplete common mesentery anomaly is rare, its clinical implications necessitate thorough understanding among medical professionals. As seen in our case, prompt diagnosis, interdisciplinary collaboration, and timely surgical intervention can lead to successful outcomes and minimize morbidity.

This report emphasizes the importance of recognizing and managing rare congenital anomalies, underscoring the significance of medical research in expanding our understanding of such conditions. Future studies may further illuminate the intricacies of these anomalies, potentially leading to more effective diagnostic and therapeutic strategies.

CONSENT

Written informed consent was obtained from the patient for publication of this case and for the accompanying images.

ETHICAL APPROVAL

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

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Figure1 : Abdominal CT scan with coronal reconstruction: demonstrates the presence of proximal small bowel distension associated with a whirl-like image consistent with volvulus, along with abnormal positioning of the small bowel to the right, whereas the cecum and the appendix are located in the left iliac fossa, thereby confirming the verticalization of the superior mesenteric artery and vein.

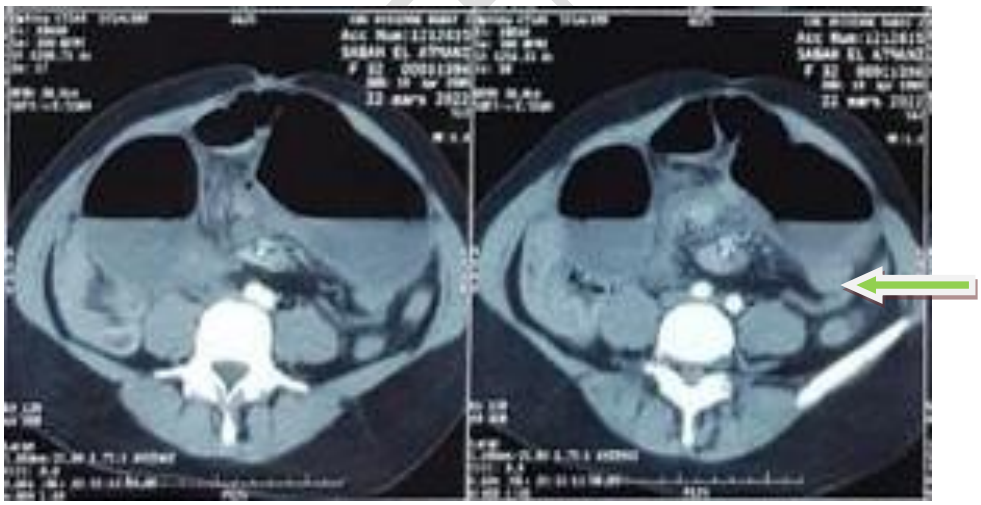

Figure 2 : Abdominal CT scan with axial reconstruction: reveals the presence of proximal small bowel distension associated with a whirl-like image consistent with volvulus, along with abnormal positioning of the small bowel to the right, whereas the cecum and the appendix are located in the left iliac fossa as indicated by the green arrow. It also demonstrates mesenteric infiltration around the arterial axis.

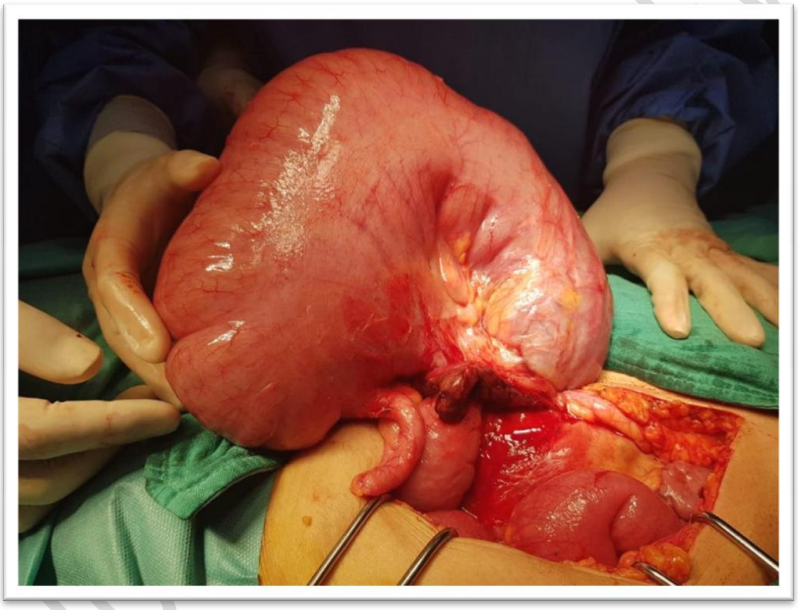

Figure 3: Intraoperative Images of Small Bowel Volvulus on Incomplete Common Mesentery