Case report

Common Mesentery in Small Bowel Volvulus - A Case Report

Abstract

The commonmesenteryis a very rare anomaly of digestive tube rotation in adults. It exhibitshighly variable manifestations rangingfrom abdominal discomfort to acute intestinal obstruction, whichpresents the mostdreaded complication amongthese manifestations. Nowadays, although the focus is on the progress of radiologicalimagingmethods, the final diagnosisremainspreoperative.

We report the case of a 34-year-old womanwith a history of transit disorders, whowasadmitted to surgical emergencies with a presentation of high digestive obstruction lasting for 4 days. An abdominal X-ray revealed central air-fluidlevels 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 wasdiscoveredwithinvolvement of the completecommonmesentery.

Keywords: Volvulus, commonmesentery, intestinal obstruction, small intestine, case report

INTRODUCTION:

The commonmesenteryanomalyrepresents a congenital condition characterized by a complete or partial rotation of the digestive tube by an angle of 180° [1]. Frequently, affectedindividualsremainasymptomatic, and the anomalyisoftenincidentallydiscovered; its occurrence in routine surgical practice isnotablyinfrequent, accounting for a mere 0.2% to 0.5% of cases [2].

However, instances involving a completecommonmesenterymayoccasionallymanifest as acute progressive complications, particularly acute smallbowel obstruction. Due to the lack of propermesenteric fixation to the retroperitoneum, such cases can furtherdevelopinto total smallbowel volvulus, intussusception, or megacolon [3].

The initial diagnostic approachisfrequentlyfacilitated by the use of medicalimaging, which assumes a pivotal role in accuratediagnosis. In standard clinical practice, the diagnostic process commences with an Abdominal X-ray (AXR) withoutpriorpreparation, revealing air-fluidlevelsthatexhibit a greaterwidththanheight. Theselevels are centrallylocated and indicative of a smallbowel obstruction syndrome. Subsequently, a ComputedTomography (CT) scan isrecommended to corroborate the etiologicaldiagnosis of the occlusion. The CT scan showcases a characteristic "whirl" sign, whichiswidelyconsideredpathognomonic by a majority of researchers [4]. Notably, cases involving total smallbowel volvulus associatedwith a completecommonmesentery mandate urgent surgical intervention, necessitating prompt surgical exploration.

CASE REPORT

A 34-year-old femalepresented to the emergency departmentwithseverecolicky abdominal pain accompanied by intermittent episodes of nausea and vomiting. The patient reported a history of constipation persisting for over 2 months. Sheindicatedthather abdominal pain initiallystarted as moderatediscomfort but hadprogressivelyintensified to becomeunbearable, oftenalleviatedtemporarily by postprandial vomiting. Throughoutthisperiod, the patient remainedafebrile, and heroverallgeneral condition waswell-maintained.

Uponphysicalexamination, the patient exhibited normal breathing patterns, but her abdomen appeareddistended and tender upon palpation. Notably, hernial orifices werefound to be free of any obstruction. A rectal examinationrevealed an empty rectal ampulla. Laboratory investigations, including a completeblood count (CBC), C-reactiveprotein (CRP) levels, and ionogram, revealedhyperleukocytosis and elevated markers of systemic inflammation. An urgent abdominal-pelvicComputedTomography (CT) scan wasperformed, revealing proximal smallbowel distension accompanied by a whirl-like image consistent with volvulus (Figure 1, Figure 2). The scan furtherdemonstrated a vertical orientation of the superiormesentericartery and vein (Figure 1) and an abnormalpositioning of the smallbowel to the right, whereas the cecum and appendixwereobserved in the leftiliacfossa. Based on the comprehensiveanalysis of the CT images, a preliminarydiagnosis of incompletecommonmesentery-associatedsmallbowel volvulus wasestablished. This diagnosiswassubsequentlyconfirmedduringsurgical exploration (Figure 3).

Following a brief period of stabilization, the patient wasurgentlytaken to the operating room. The surgical exploration revealed extensive distension and compromised perfusion of the entiresmallbowel. A twist wasidentified in both the first jejunalloop and the terminal ilealloop (Figure 3). Notably, the cecumwaspositioned in the leftiliacfossa, adhering to the wall due to a Ladd's band (Figure 3). The surgicalprocedureinvolvedcounterclockwisedetorsionfollowed by immediate reperfusion of the small intestine. Subsequently, corrective surgerywasperformed to address the embryologicalrotationalanomalyaccording to the Ladd'sprocedure. This entailed releasing adhesions, converting the incompletecommonmesenteryinto a complete one to preventrecurrence, and concludingwith a precautionaryappendectomy (Figure 3). The patient'spostoperative course wasuneventful, and shewasdischargedafter a 4-day hospitalstay.

DISCUSSION

The commonmesenteryanomaly arises from a congenital malformation due to an anomalous rotation of the primitive umbilicallooparoundits axis, resulting in a sharedmesentery for all portions of the intestine. This malformation can manifest as an interrupted 180° intestinal rotation, leading to a position where the ileocecaljunction attaches in the subhepaticregion [5]. If thisattachmentoccurs adjacent to the duodenum, a commonlyencounteredentityknown as the "Ladd's Band" forms, connecting the cecum to the right superolateral abdominal wall [6]. This well-recognizedperitoneal band can cross the second part of the duodenum and may cause high-level acute intestinal obstruction in an otherwiseasymptomaticadult patient. In some instances, a congenital fusion between the mesentery of thesetwo intestinal loops, termed "Pellerin'smesenteric fusion," can alsoexist [7].

In the 180° rotation position, the mesenteric root becomesextremely short, and the entiresmall intestine is "pedicled" on itssuperiormesentericvascular axis. This configuration, referred to as "incompletecommonmesentery," carries a high risk of total smallbowel volvulus due to the shortness of the mesenteric root and itslack of attachment [8].

The commonmesenteryanomalyremains a seldom-encountered condition in routine surgical practice [9]. Itsexceptional occurrence in adulthood, coupledwith diverse symptomatology, often leads to diagnostic and therapeuticdelays and errors, contributing to the factthatmost cases are posthumouslydiagnosed [10].

The diagnosis of completecommonmesentery-associatedsmallbowel volvulus can arise in variouscontexts. The incompletecommonmesenteryisrarelysymptomatic and isoftendiscoveredincidentallyduringradiologicalexaminationsperformed to investigateotherknown conditions [11]. More rarely, it can bediscoveredduringlaparoscopicsurgery, such as followingcholecystectomy [12], appendectomy [13], or obesitysurgery [14]. However, it can alsopresentwithrecurrent abdominal pain, sometimesaccompanied by alterations in bowel habits [15].

Total smallbowel volvulus represents the mostdreaded complication of thiscongenitalanomaly, necessitating urgent diagnosis in response to an acute intestinal obstruction or evenshock, which can lead to fatal outcomeswithoutappropriate intervention.

The diagnosisispredominantlyfacilitated by contrast-enhancedComputedTomography (CT) scans, which serve as the referenceexamination and gold standard for diagnosing total smallbowel volvulus associatedwithincompletecommonmesentery in adults [16]. The CT scan serves as the gold standard for positive, topographical, and severity-based diagnoses. Technically, itinvolves an abdominal-pelvic scan withcontrastenhancement. The "whirl" signappears to bepathognomonic 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 superiormesentericartery. This iswhere the superiormesentericvein and proximal jejunumbecome "entwined." The contrast injection highlights the verticalization or inversion of the superiormesentericvessels, with the veinpositionedabove or to the left of the artery [19], althoughthissignis not always consistent. The thickness of thiswhirl mass isbelieved to correlatewith the degree of volvulus rotation; however, a more preciseassessment of the degree of rotation isachieved by calculating the number of twists made by the mesentericvessels [20].

An understanding of the anatomy of the incompletecommonmesenteryisimperative for intraoperativediagnosis and comprehension of the principlesunderlyingsurgical correction. In the typicalform of the 180° intestinal rotation, known as the incompletecommonmesentery, the duodenumistruncated, endingafter D2 with the Treitz angle positioned to the right of the spine. The cecumisfound in the subhepatic position, and the mesenteric root isvery short, centered on the superiormesentericvascular axis, oftenresulting in a pedicle-like appearance [21]. In the context of acute obstruction, the primarychoiceis a midlinelaparotomy, and the Ladd'sprocedureremains the standard treatment for bothadults and children [22]. This procedureinvolves a midlinelaparotomy, followed by counterclockwisedetorsion of the volvulus, followed by releasing the bands responsible for the shortening of the mesenteric root. This issucceeded by fixing the intestine to the completecommonmesentery to preventrecurrence. The procedurealsoincludes a precautionaryappendectomy [23]. The prognosisisgenerally favorable, contingent on timely intervention before the onset of intestinal compromise.

CONCLUSION

Advancements in medicalimaging, particularlycontrast-enhancedComputedTomography (CT) scans, have revolutionized the diagnostic process, enablingaccurate identification of characteristicsigns like the "whirl" pattern. This imagingmodalityplays a criticalrole in guidingsurgical interventions.

The surgicalapproach, represented by the Ladd'sprocedure, remains the cornerstone of treatment. By addressingboth the volvulus and the anatomical anomalies associatedwithincompletecommonmesentery, thisprocedureoffers a comprehensive solution to preventrecurrence and alleviatepotential complications.

Although the incompletecommonmesenteryanomalyis rare, itsclinical implications necessitatethoroughunderstandingamongmedicalprofessionals. As seen in our case, prompt diagnosis, interdisciplinary collaboration, and timelysurgical intervention can lead to successfuloutcomes and minimizemorbidity.

This report emphasizes the importance of recognizing and managing rare congenital anomalies, underscoring the significance of medicalresearch in expandingourunderstanding of such conditions. Future studiesmayfurtherilluminate the intricacies of these anomalies, potentiallyleading to more effective diagnostic and therapeuticstrategies.

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 smallbowel distension associatedwith a whirl-like image consistent with volvulus, alongwithabnormalpositioning of the smallbowel to the right, whereas the cecum and the appendix are located in the leftiliacfossa, therebyconfirming the verticalization of the superiormesentericartery and vein.

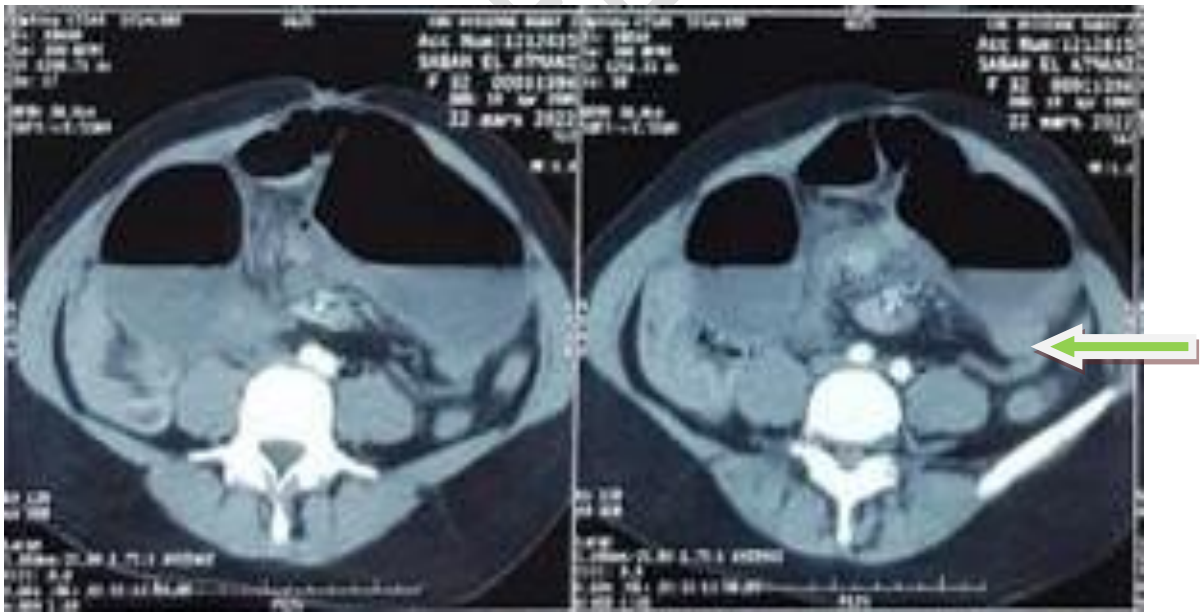

Figure 2 : Abdominal CT scan with axial reconstruction: reveals the presence of proximal smallbowel distension associatedwith a whirl-like image consistent with volvulus, alongwithabnormalpositioning of the smallbowel to the right, whereas the cecum and the appendix are located in the leftiliacfossa as indicated by the green arrow. It alsodemonstratesmesenteric infiltration around the arterial axis.

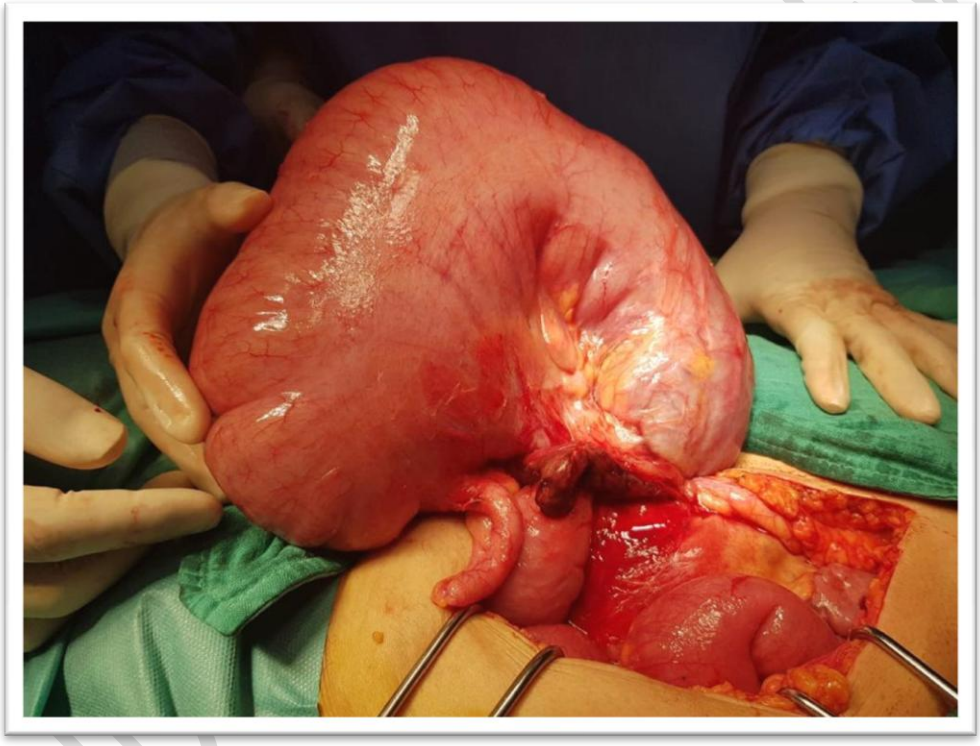

Figure 3:Intraoperative Images of Small Bowel Volvulus on Incomplete Common Mesentery