Malrotation with Midgut Volvulus and Internal Abdominal Hernia in an Adult: A Case Report and Review of the Literature

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Abstract

Midgut volvulus is a rare surgical emergency in adults, typically presenting in infancy or childhood. We report a case of a previously healthy adult male who presented with a one-day history of acute abdominal pain. Imaging raised concern for intestinal obstruction, prompting an urgent exploratory laparotomy. Intraoperatively, the patient was found to have midgut volvulus caused by congenital malrotation with absent lateral peritoneal attachments of the large bowel, along with an internal herniation of small bowel loops. The presence of a mobile colon added further complexity to the pathology. This case highlights the diagnostic difficulty of midgut volvulus in adults, as symptoms are often nonspecific and insidious. Given the rarity of such presentations in adulthood, a high index of clinical suspicion is essential. We share our surgical approach and review relevant literature to emphasize awareness and guide future management of similar cases.

Keywords: Bowel Obstruction; Acute Abdomen; Midgut Volvulus; Internal Hernia.

Introduction

Adult midgut volvulus is a rare and challenging surgical diagnosis that requires high index of suspicion along with appropriate diagnostic modalities. and management strategies to ensure optimal patient outcomes. The prevalence of malrotation in general is estimated to be 1 in 6000 live births, as 64–80% of cases present in the first month of life and 90% within the first year. Adult presentation is accounting for only 0.2–0.5% of cases, of which only 15% present with midgut volvulus,[1,2] with around 100 cases confirmed in the literature.[1,3,4] The condition usually results from intestinal malrotation, a congenital anomaly that disrupts the normal rotation and fixation of the midgut during embryonic development; therefore, most cases are found during early years of this and only a small percentage presents as adults.[3,5] The pathophysiology involves the intestines twisting around the superior mesenteric artery and vein, resulting in strangulation and bowel obstruction. This can further progress to bowel ischemia leading to gangrene, sepsis, and short bowel syndrome, with potentially catastrophic outcomes.[3,5] Another diagnosis that was of interest in our case was the lack of lateral colonic attachments, which a rare entity in humans and has been described in some case as 'Mobile right colon syndrome.[6,7] The combination of both of these diagnoses coming simultaneously added to the complexity of this care; due to its nonspecific symptoms and uncommon diagnosis, overlapping with most abdominal conditions. Some patients have reported recurrent episodes of abdominal pain, nausea, vomiting, constipation, or diarrhea, since childhood.[3,8] Patients may complain of on and off abdominal pain, bloating and vomiting, commonly in the postprandial period. Conversely, ~10–15% of adults with malrotation present with acute volvulus complaining of severe sudden abdominal pain, nausea, vomiting, hematemesis or hematochezia, with or without hemodynamic instability.[3,4] Imaging modalities play a crucial role in confirming the diagnosis, with computed tomography scans being the preferred method. This prevalence will likely increase as incidental diagnosis of malrotation increases secondary to advances in those diagnostic imaging tools.[9]

We aim to describe our approach and experience for this condition, in order to add to the scarce description in the literature and possible contribute for the ideal management protocol for such cases.

Case Report

This is a 31-year-old middle eastern male with no significant past medical or surgical history presented with generalized abdominal pain radiating to the back that started one day prior, associated with nausea and vomiting. He denies any history of fever or changes in bowel habits. The patient reported previous transient episodes of non-specific abdominal pain that resolved without attending to medical care.

On examination the patient was conscious, alert, and oriented. His heart rate upon presentation was 63 with blood pressure of 123/64 and he was afebrile. Abdominal examination showed no apparent discoloration or masses on inspection. Upon palpation he had generalized tenderness with voluntary guarding.

Laboratory investigations were significant for CRP 29, otherwise normal. His x-ray showed dilated bowel loops at the left upper quadrant (Figure 1).

Figure 1: distended left upper quadrant with distal collapsed bowels.

CT abdomen with IV contrast showed: Small hiatal hernia with minimal dilated proximal part of duodenum, which starts to whirl around the superior mesenteric vessels distally, giving the whirlpool sign, inverted SMA/SMV relationship, all the small bowel loops are located on the right side, the cecum is elevated. The distal bowel loops are collapsed. Findings are concerning for partial midgut volvulus (Figure 2 a-c).

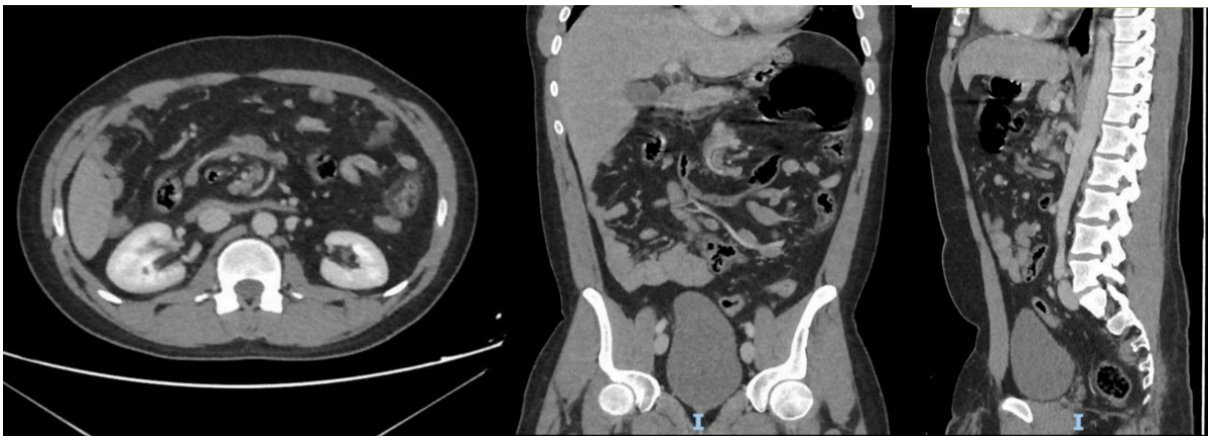

Figure 2: The whirl pool sign as the whirl around the superior mesenteric vessels distally, bowel loops are located in RUQ with elevated cecum.

Due to uncontrollable pain; the patient he was shifted for exploratory laparotomy. Intraoperative finding: The bowel from proximal jejunum till cecum was collapsed, the cecum was seen high in the RUQ without any surrounding attachments. The duodenojejunal junction was leaving through a mesenteric defect below the transverse colon surrounded by a large vein. Large bowel lacks any attachments (Figure 3 a-b).Intervention: The bowel was released from the defect; bowel loops recovered normally. The large bowel

was fixed to the abdominal wall at cecum, ascending colon, descending colon, and sigmoid region. Drain inserted. Complications: None.

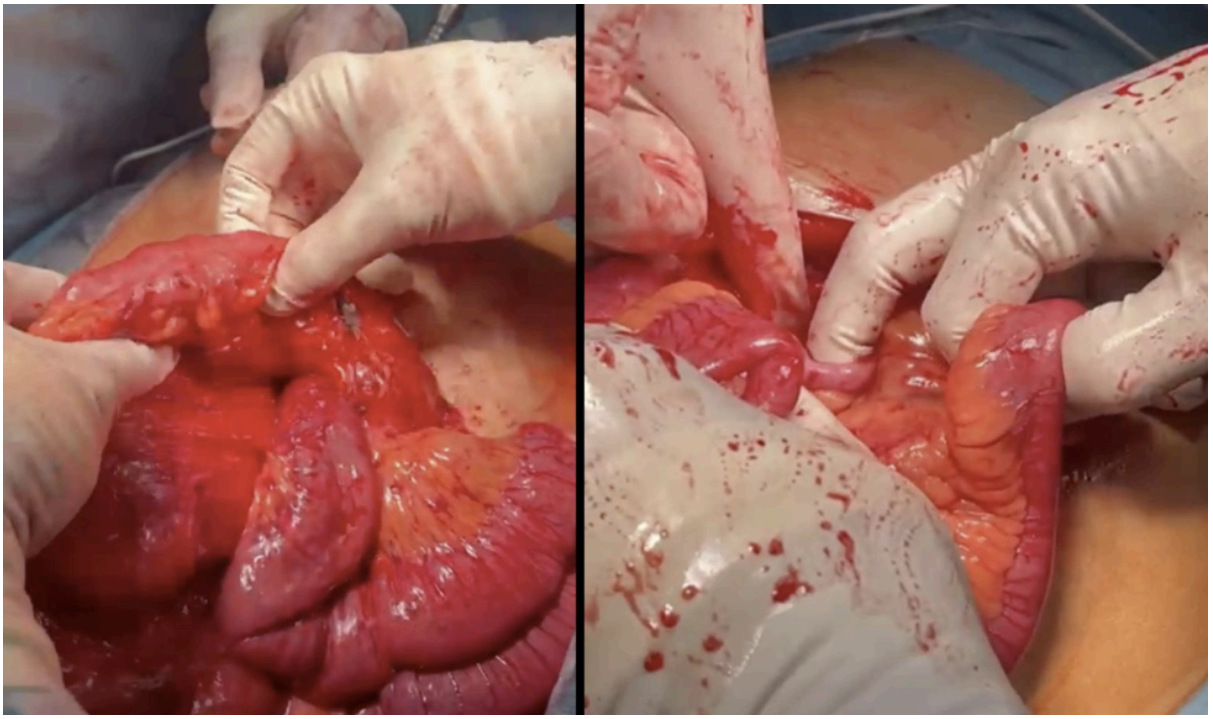

Figure 3: The jejunum is seen herniating from under the transverse colon (left). Appendix was seen in the left upper quadrant with cecum; and the small bowel was collapsed (right).

Patient had an uneventful postoperative hospital, and patient discharged and followed up two months after with no concerns.

Discussion

Midgut volvulus usually results from intestinal malrotation, a congenital anomaly that disrupts the normal rotation and fixation of the midgut during embryonic development during 10-12 weeks of gestation. This can be in the form of: non-rotation, incomplete rotation, reverse rotation and anomalous fixation of the mesentery.[10] The percentage of midgut torsion in adults with malrotation is about 12 %.[2]

Most adults present with chronic symptoms which may be present for greater than 6 months. Patients may complain of intermittent abdominal pain, bloating and vomiting, frequently in the postprandial period. Conversely, ~10–15% of adults with malrotation present with acute volvulus complaining of severe abdominal pain, nausea, vomiting, hematemesis or hematochezia, with or without hemodynamic instability. In this current report, our patient had an acute presentation of severe abdominal pain for one day duration associated with nausea and vomiting that required an urgent surgery, he had previous chronic non-specific abdominal symptoms that is of unknown source. and denied other chronic symptoms, and presented acutely with obstruction secondary to volvulus.

Investigations should be aimed at excluding emergencies in such patients; start by examination then followed by imaging. X-ray might be informative in regards of frank pneumoperitoneum or signs of bowel obstructions, while CT scan plays a crucial role in identifying characteristic signs like the "whirlpool sign" due to bowel wrapping around superior mesenteric artery indicative of volvulus; or inverted superior mestetric artery and vein position and other signs of ischemia, such as pneumatosis intestinalis, bowel wall edema, and others, necessitating urgent surgical intervention.

In our case, the first pathology was the mesenteric defect below the transverse colon; contributing to internal hernation of the jejunum in the defect just 10cm from DJ junctions and this is the cause of obstruction and the bowel was collapsed after it till cecum; it was released with a healthy bowel. The second pathology was the absence of any lateral wall attachments of whole colon and it was crowded with the small bowel, leading to the appendix coming at our site when we started with an open upper midline incision.

Another interesting case reported by Ramirez et al in an elderly with no prior abdominal surgery; finding were large internal herniation of the majority of the small bowel through a mesenteric defect along with rotation of the small bowel greater than 180° around the engorged superior mesenteric pedicle.

An additional pathology in our case was the congenital absence of lateral colonic attachments; this rare case has been described in few studies.[6,7] Mazingi et al has described peritoneal zygosis as a process of adherence of primitive dorsal mesentera with the peritoneal of the posterior abdominal wall. Failure of this process has been linked to mobile right colon, which has been described in 10-20% of the population.[12,13]

The management of such cases lies in the basic principles of resuscitation, diagnostic approach, and planning for surgical intervention if needed. The surgical intervention is mainly focused on the congenital cause of midgut volvulus, which is an accessory ligament or Ladd's band that is a fibroid peritoneal attachment between the cecum and the peritoneum, compressing the duodenum, leading to intestinal obstruction. The main surgery is the release of such bands to relieve obstruction. However in our case no such bands were found; the main reason was from of an internal herniation along with lack of lateral attachments of large bowel so cecopexy was done and fixation of ascending and descending colon and sigmoid was done; in order to prevent further twisting in the future or misleading pathology in case of any painful episodes.

Conclusion

We present a rare case of malrotation with midgut volvulus with an underlying completely mobile colon and internal hernia in an adult. This case sheds a light on new etiology for volovls, other than ladd's bands. Our surguical approach constituted of correction of bowel orientation followed by reduction of hernia and colopexy. This technique was safe in our case and uneventful for the patient later-on, and we would like to present it for comparison with different approaches.

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