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Acute Meckel's diverticulum with perfotation and segmental bowel ischemia: Case report

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ABSTRACT

The MD is among the most common congenital GI tract defects that are found, it's rarely complicated with perforation which seriously impair the ability to diagnose the illness. Intussusception, inflammation, bleeding, intestinal obstruction and volvulus are other frequent complications of MD. Sometimes, it presents similarly to acute appendicitis. We present a case of a 30-year-old female came to emergency department with 12 hours constant generalized abdominal pain that started suddenly for the first time in her life, colicky in nature, associated with loss of appetite, nausea, 4 episodes of non-bilious vomiting and watery non-bloody diarrhea. After imaging, the patient underwent diagnostic laparoscopy which changed to exploratory open laparotomy, which revealed a perforated MD. This instance emphasizes how crucial it is to rule out MD as a possible diagnosis for patients who exhibit sudden, severe abdominal discomfort. An early identification of a perforated MD might be aided by a comprehensive approach to the history and physical examination in addition to imaging.

Keywords: Meckel's diverticulum, bowel obstruction, acute abdominal pain, case report

1. INTRODUCTION

Meckel's diverticulum (MD) id one of the most prevalent omphalimesenteric duct malformation in the gastrointestinal system (GI). It originates from partial obliteration of the omphalimesenteric duct, forming a genuine diverticulum that is located 7 cm to 200 cm from the ileocecal valve and made up of all layers of the GI wall (Kuru and Kismet, 2018). According to Hansen and Søreide, (2018) and Lequet et al., (2017), the prevalence in the general population is 0.3% to 2.9%, while in cadaveric autopsies, it ranges from 0.14% to 4.5%. The primary histology of MD is identical to that of the ileum; nevertheless, reports of ectopic tissue have been made, including pancreatic duodenal, colonic, and gastric mucosal tissue, the most prevalent kind of ectopic tissue (Lequet et al., 2017).

Since DM is discovered by accident during surgery or while looking for other disorders, the majority of MDs stay asymptomatic and progress silently (Lequet et al., 2017; Kuru and Kismet, 2018). As a result, diagnosing MD is thought to be difficult because the condition also has vague symptoms. Because of this, laparoscopy is the recommended diagnostic technique; yet, it is seen as intrusive in comparison to other modalities and is not used as a first diagnostic step. Technetium-99m nuclear imaging is a frequently used non-invasive diagnostic method; nevertheless, when used to identify MD in adults, its sensitivity, specificity, and accuracy diminish (Kuru and Kismet, 2018). The obstruction's pathophysiology can vary; the most common causes include intussusception Lequet et al., (2017), volvulus, abdominal wall hernia tumors, and bands that run between the MD and the mesentery base (Kuru and Kismet, 2018).

Primary treatment for MD is surgical resection using a laparotomy, laparoscopic, or laparoscopically assisted technique in both adults and children (Kuru and Kismet, 2018). The most popular method for treating symptomatic or complex MD is wedge resection combined with end-to-end anastomoses. Although the practice of resecting the MD as a preventive measure is controversial, a population-based study supported this approach, citing the site's 70-fold increased risk of developing cancer when compared to other ileal sites (Hansen and Søreide, 2018). However, Hansen and Søreide, (2018) argue that the substantial morbidity and advice against resection do not justify the modest benefit of postoperative problems.

2. CASE PRESENTATION

In October 2022, A 30 years old female known case of iron deficiency anemia and primary infertility with a previously free surgical history, presented to emergency department with 12 hours constant generalized abdominal pain that started suddenly for the first time in her life, colicky in nature, associated with loss of appetite, nausea, 4 episodes of non-bilious vomiting and watery non-bloody diarrhea. She denied any history of fever, any change in urine or urinary symptoms. Upon examination her vitals were all within normal range, afebrile. She was alert and oriented, have a soft distended abdomen, tender all over, hernial orifices were clear and negative cough impulse. A bedside ultrasound was done in the emergency room found to have a distended gallbladder but no stones were appreciated.

Initial investigations were labs all within acceptable range, Abdomen x-ray showed multiple air-fluid levels, thus she was pushed to CT to investigate her. In the CT, a diffuse dilatation of the small bowel reaching up to 4 cm with transition zone seen at distal ileum, subsequent 15 cm distal ileum segment decrease wall enhancement with perforation, multiple free air foci and small loculated collection measures 4 x 3 cm seen in the right hemipelvis. The large bowel and terminal ileum appears collapsed. There is small amount of pelvic free fluid and per hepatic free fluid. Therefore, she was diagnosed by imaging as high-grade bowel obstruction with transition zone seen at the distal ileum associated with perforation and segmental bowel ischemia. We admitted her into General Surgery as case of bowel obstruction, bowel ischemia and perforation, she was kept NPO on intravenous fluids, started on analgesia, antiemetic, and empirical antibiotics.

After resuscitation and stabilization, she was pushed to operative room for exploratory laparotomy as emergency case. We started with diagnostic laparoscopy. Running of the bowel was done until a segment of small bowel was seen (Figure 1), ischemia. A decision to convert to open was made. Lower midline incision was done. Bowel was run until a looped segment of small bowel was seen around 40 cm from the ileo-cecal junction. A band of another part of small bowel was wrapped around it and it was released which turned out to be a very long MD that was wrapped around the dusky segment of small bowel with resultant strangulation of the involved segment of the small bowel. Small mucosal tear was seen in the lower part of the MD. Decision was made to cut the infected part of small bowel and to include the diverticulum with the resection. Resection was done using GIA stapler blue cartridge proximally and distally. Resected parts were measured 37 cm.

Stay suture of Prolene was applied at the anti-mesenteric border between the two segments. Enterotomies were made at the anti-mesenteric border and GIA staple blue cartridge was introduced. A side-to-side anastomosis was done. Palpation to assure that the bowel diameter was not narrow was done. The enterotomies were closed with stapler. The mesentery stapler again was with blue cartridge and the mesentery was closed using interrupted sutures of Prolene. The remaining of small bowel appeared healthy and viable after ensuring the needle and gauze count. The patient tolerated the procedure well. The patient was shifted to ICU in stable condition. Few days after the surgery CT with oral and intravenous contrast was done and there was no evidence of leak, and anastomotic site is clear with no signs of mechanical obstruction in the small bowel.

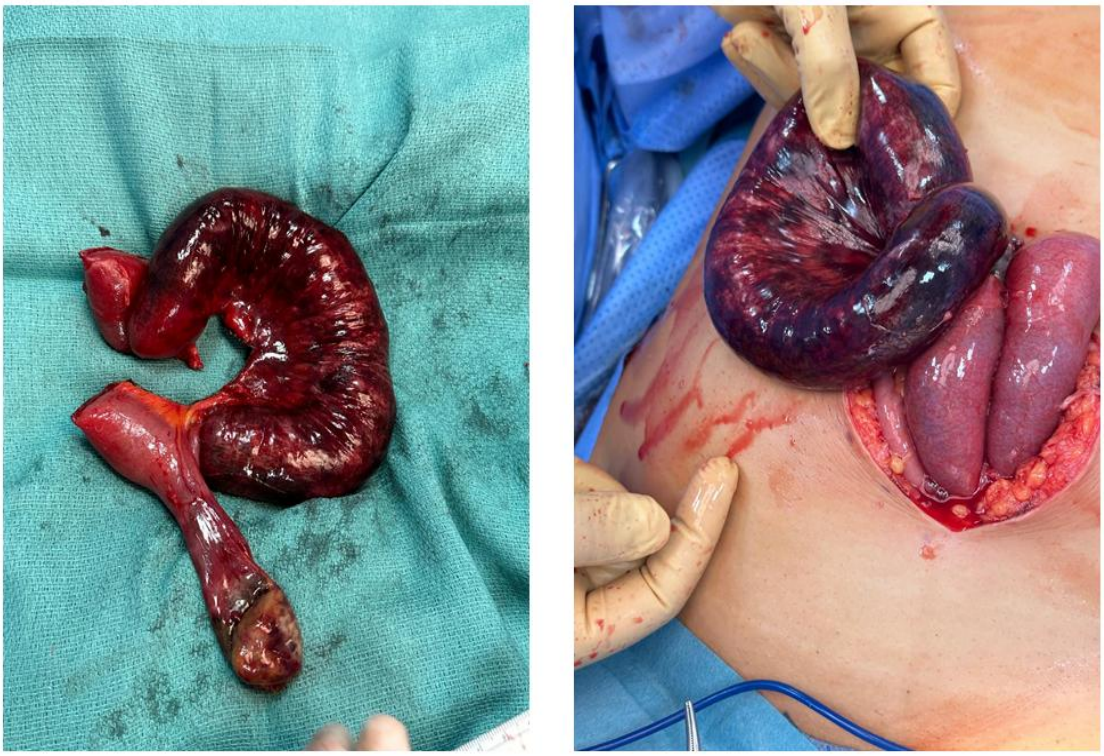

Figure 1 Affected part of the bowel (segmental bowel ischemia)

3. DISCUSSION

MD is a well-known congenital GI tract abnormality (Farah et al., 2015; Ding et al., 2012). It affects about two percent of people in general (Farah et al., 2015; Ding et al., 2012). The most common consequences associated with Meckel's diverticulum are intussusception, volvulus, inflammation, intestinal obstruction, and bleeding. Other complications include intussusception and volvulus. MD relatively rarely manifest as perforations, occurring in 0.1 to 21% of symptomatic patients (Lequet et al., 2017; Modi et al., 2015). Usually, a stercolith causes the diverticulum to become obstructed, which leads to inflammation and necrosis (Lequet et al., 2017; Modi et al., 2015). As in this instance, MD might lead to perforation, which complicates the diagnosis.

Due to the non-specific nature of the symptoms and imaging findings, MD diagnosis is particularly challenging (Dimitriou et al., 2013; Chan, 2009). Due to their inability to distinguish between a diverticulum and a bowel loop, CT scans and ultrasounds are not diagnostic (Ding et al., 2012). As in our case, preoperative definitive diagnosis was not possible in over 90% of MD cases (Ding et al., 2012). Only in a small number of instances—like the studies by Ymaguchi et al., (1978) and Mohanty et al., (2014)—was MD identified using a CT scan prior to surgery. Most MD cases are asymptomatic and are unintentionally found during surgery (Sharma and Jain, 2008).

Both diagnostic and therapeutic purposes can be achieved with laparotomy or laparoscopic procedures (Lequet et al., 2017; Ding et al., 2012). The use of antibiotics and bowel rest as non-operative measures is recommended for uncomplicated acute diverticulitis rather than surgery. A novel and sophisticated technique that can help with diagnosis and further guide treatment options is double balloon enteroscopy (Fukushima et al., 2014; Konomatsu et al., 2017).

4. CONCLUSION

Even though MD perforation is extremely uncommon, it should always be considered a differential diagnosis for any patient who presents with an acute abdomen. To avoid the morbidity and mortality linked to late complications, an emergency laparoscopic or open exploration should be carried out when the nature of the condition is likely to necessitate surgical care.

Ethical approval
Not applicable.

Informed consent
Written & Oral informed consent was obtained from individual participants included in the study.

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Conflict of interest
The authors declare that there is no conflict of interests.

Data and materials availability
All data sets collected during this study are available upon reasonable request from the corresponding author.

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