

Case Report

Bleeding Meckel's diverticulum leading to massive per rectal bleeding and circulatory collapse.

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Introduction

Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract. It is a true diverticulum that results from incomplete regression of the omphalomesenteric duct [1]. It is often asymptomatic, but can present with serious complications such as intussusception, ulceration, torsion, hemorrhage, obstruction, inflammation, and fistula formation. The rule of 2s has been used to characterize this condition, referring to a population prevalence of 2%, typically located within 60cm proximal to the ileocaecal valve; symptomatic lesions largely present prior to the age of 2 and their length is often approximately 2 inches (5 cm) [2]. Nonetheless, Meckel's diverticulum can remain silent and become symptomatic in adulthood [3]. We report a case of Meckel's diverticulum complicated by significant bleeding leading to class IV hemorrhagic shock in an 18-year-old female.

Case History

An 18-year-old female presented to the surgical causality with acute onset haematochezia for 7 hours. She was bleeding fresh blood in moderate to severe amounts. There was no associated pain. She had been investigated for a similar episode about 4 years back, but defaulted. A colonoscopy was done and it was normal. There was no history of gastro oesophageal reflux symptoms, NSAID usage or a history of haematemesis or melaena. She did not use blood thinners, smoke cigarettes, drink alcohol or use illicit drugs. There was no history of bleeding from any other sites or

menorrhagia. She was not on any routine drugs for any other disease and had no record of past surgeries. She had no family history of bleeding disorders.

On examination, she was averagely built but pale. Her blood pressure was 100/60 mmHg and the pulse rate was 92 bpm (shock index 0.9). Digital rectal examination showed fresh PR bleeding. Her haemoglobin level was 7.2 g/dl, platelets 289 and INR was 1.2. IV access was obtained and blood sent for DT and investigations. Crystalloid resuscitation was done until blood became available. Following the initial resuscitation, she responded transiently. Later, she started bleeding again, which was more severe than before. An urgent CT mesenteric angiogram was planned. While waiting for the angiogram she became unstable despite the resuscitation. With the massive PR bleeding, the patient went into class IV hemorrhagic shock. The patient was immediately taken to theatre and emergency exploratory laparotomy was performed with the intention of performing an on-table colonoscopy.

After completing WHO-safety checklist and epidural catheter insertion with pre-emptive analgesia, the patient was placed in a supine position with arms abducted to 90 degrees. Prophylactic intravenous antibiotic (cefuroxime 750mg) was given at induction and mechanical thromboprophylaxis undertaken. A lower midline incision was made. Deepened through the subcutaneous tissue into the peritoneal cavity. During the bowel survey Meckel's diverticulum was detected at 5 cm from ileocecal valve (Figure 1). The bowel was opened during surgery to confirm bleeding and the whole segment was resected completely. The rest of the abdomen was normal. Bowel was anastomosed end to end with 4/0 proline. Routine laparotomy closure was done. The resected segment was sent for histology.

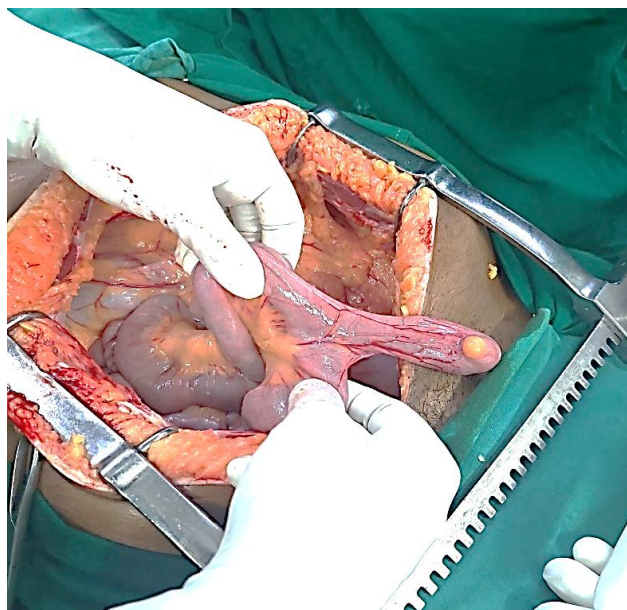


Figure 1: Meckel's diverticulum

She was admitted to the ICU for post operative observation. Post operative Hb was 9.3 g/dl. The patient was fully awake at the ICU with stable vital parameters. She maintained good urine output of around 1ml/kg/hour. Analgesia was provided with subcutaneous morphine. Oral clear fluids was started the following day and feeding gradually escalated. On the following day she was mobilised to a chair and transferred to the general surgical ward. She was discharged on post op day 5 and reviewed in clinic after 2 weeks and 2 months. At the clinic visit she was doing well, and the surgical wound had healed. Skin staples were removed.

The histopathology report indicated a diverticulum with a mucous filled area measuring 4cm*2.5cm. Sections of the diverticulum showed all layers of the intestinal wall. Ectopic specialized gastric tissue was present in the diverticulum. Features of inflammation or malignancy was not seen.

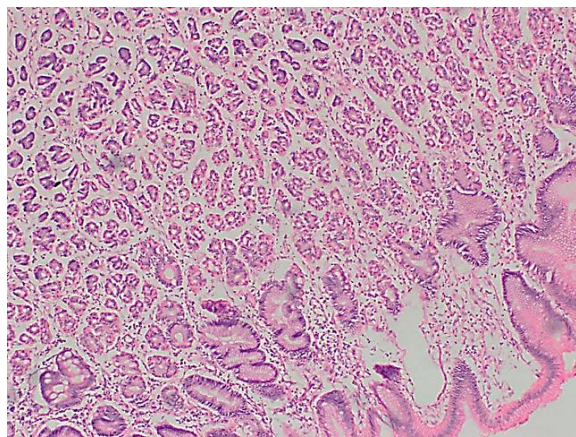


Figure 2: Histology of the diverticulum

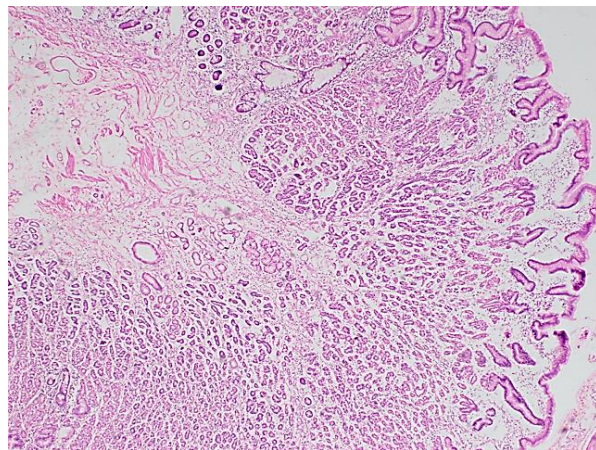


Figure 3: Histology of the diverticulum

Discussion

Meckel's diverticulum (MD) is present in 2-4% of the population due to failure of obliteration of the vitello-intestinal duct. It is the most common congenital disease of the gastrointestinal tract. It is rare in the adult population [4]. Symptomatic MD in children has been reported to present with obstruction in 46.7% of cases, gastrointestinal haemorrhage in 25.3% and inflammation in 19.5%. Intraperitoneal haemorrhage from MD is extremely rare in both adults and children [5]. Regarding the location and mechanism of bleeding, the causes of bleeding can be classified into the following three categories: (1) blood flow obstruction or inflammation, (2) perforation with ectopic gastric mucosa and (3) other causes such as blunt abdominal trauma caused by seat belts and aneurysmal rupture of a meso diverticular band to a Meckel's diverticulum [6].

There is no gender difference in the incidence of Meckel's diverticulum, but most patients with symptomatic MD are male, with a male: female ratio ranging from 1.5:1 to 4:1. There is a report that males are more likely to have ectopic tissue than females. It is known that the presence of ectopic tissue increases the frequency of symptomatic MD. Therefore, the higher frequency of ectopic tissue in male than female may explain the higher incidence of symptoms in males than in females [7].

There are several surgical approaches for MD, such as segmental small-bowel resection including the diverticulum and diverticulectomy only. Some surgeons prefer to perform segmental small-bowel resection, including Meckel's diverticulum, because they want to include any possible intestinal ulceration within the resection samples, while other surgeons choose the latter because they consider that the ulcerated ileum is close to the ectopic gastric mucosa. In this patient we followed the 1st approach [8].

The most common ectopic tissue found in Meckel's diverticula is gastric mucosa. Secretions from these cells can damage and erode adjacent intestinal mucosa, resembling peptic ulcer disease. Proton pump inhibitors block the H⁺/K⁺ ATP proton pump, thereby inhibiting the final process of acid production and secretion that is mediated by gastrin, H₂, and cholinergic pathways. H₂ blockers specifically act on H₂-dependent acid generation and secretion. It is theorized that acid secretion from Meckel's diverticula that contain ectopic gastric mucosa can be suppressed by the use of PPIs and H₂ blockers, thereby preventing mucosal damage [9,10].

Although fresh PR bleeding can be due to upper GI causes, we did not do an upper GI endoscopy as the patient did not have any past history of hematemesis, melena or any risk factor for upper GI bleeding. If the site of bleeding was unknown in a stable patient, upper GI endoscopy could have been done initially as it is less invasive, less time consuming and cost effective when compared to colonoscopy and imaging [11,12]. If the patient was stable throughout, colonoscopy could be planned after bowel preparation. Performing a colonoscopy alone with the intention of diagnosing and treating hematochezia has a limited role due to poor visualization ability. Therefore, the patient was taken to the theater immediately with the intention of doing on table colonoscopy if necessary.

Patients presenting with clinically serious hematochezia should undergo upper GI endoscopy initially to rule out an upper GI source. The optimal timing of colonoscopy intervention for lower GI bleeding remains uncertain. The use of urgent colonoscopy in patients with serious LGIB showed no evidence of improving clinical outcomes or lowering costs as compared with elective colonoscopy. Most patients had no further bleeding in the hospital and did not undergo further diagnostic or therapeutic interventions for bleeding. However, a tailored approach is needed in patients with acute LGIB [13].

Laparoscopy has a very limited role in unstable patients even it is cosmetically beneficial in a young adult female. Port placement bowel handling and good access takes time even

for a competent laparoscopist when compared with an emergency laparotomy. Diagnostic laparoscopy would have been an option before laparotomy, if the patient was stable. For focal lesions with stigmata of haemorrhage, endoscopic haemostasis can be applied to control bleeding or prevent rebleeding. In two prospective studies of 335 patients with severe hematochezia who were hospitalized for this condition, the diagnostic yield has been high with this endoscopic approach [14].

When planning an emergency laparotomy for a patient who presented with hematochezia, CT angiogram or scintigraphy helps to localize the site. If the patient is unstable, surgery must be undertaken without imaging even though it is difficult to identify the bleeding site intraoperatively. In such situations, the best option would be table colonoscopy.

Pedro F et al. had reported a case report of an 18-year-old boy who presented to the emergency department after an attack of syncope. In the ward the patient had developed rectal bleeding. He had already undergone endoscopic evaluation with upper GI endoscopy, colonoscopy and capsule endoscopy and all studies were negative. An autoimmune profile was also done, which did not reveal anything. Abdominal scintigraphy was also inconclusive. Since the patient was persistently bleeding, emergency laparotomy was done, and he was diagnosed to be having a bleeding Meckel's diverticulum. This case report has described the fact of reduced sensitivity of diagnosing MD with age [15].

Zhou F. R et al has published a case report of a 25-year-old man presenting with recurrent abdominal pain and melaena. Although he underwent repeated CT scanning, no cause was identified. MR enterogram revealed that the cause for the abdominal pain was Meckel's diverticulum. To the best of our knowledge, there are no studies published in Sri Lanka regarding an adult patient presenting with symptoms due to Meckel's diverticulum [16].

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