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Intestinal obstruction caused by gangrenous Meckel's diverticulum encircling terminal ileum: a case report with emphasis on image findings

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Abstract

Mickel's diverticulum is considered the most prevalent congenital anomaly of the gastrointestinal tract. here, we report a rare occurrence where a gangrenous Mickel's diverticulum formed a loop with a part of small bowel herniated through causing bowel obstruction requiring bowel resection, in a 17-year-old patient.

Keywords: Bowel obstruction, gangrenous small bowel, Mickel's diverticulum

INTRODUCTION

Meckel's diverticulum (MD) is considered the most prevalent congenital anomaly of the gastrointestinal tract, affecting 2% of the general population [1]. Furthermore, complications of MD are rare, accounting for only 4% of patients. These include inflammation, bleeding, perforation, and obstruction. The cause of obstruction is usually intussusception, or volvulus around an attachment to the abdominal wall. Less commonly described is loop formation with the end of an MD and adjacent mesentery constricting the distal ileum [2].

We report a very rare co-occurrence of a gangrenous MD secondary to axial torsion and bowel obstruction, where the cause of obstruction was herniation of the terminal ileum through a loop between the tip of MD and the mesentery of small bowel, compromising the bowel blood supply.

CASE REPORT

A 17-year-old male patient was admitted to the emergency department with acute abdominal pain and intestinal obstruction.

The condition started 4 days before with pain around the umbilicus, radiating to the right lower quadrant of the abdomen. The pain was colicky in nature and was associated with change of appetite and infrequent vomiting. After 3 days,

the pain became all over the abdomen with constipation and low-grade fever.

On examination

- (1) Generally, his vital signs were BP 120/80, pulse 100/min, and temperature 37.5°C.
- (2) Abdominal examination revealed picture of acute abdomen with maximum tenderness and rebound tenderness on lower abdomen mainly the right side, sluggish intestinal sounds. PR examination result was negative, and there were no abdominal scars of previous surgeries.

Investigations were as follows

- (1) Laboratory: WBCs 16 800/MCL, with 80% neutrophils, hypoprothrombinemia (PC 38%, INR 2.17), and hyponatremia (Na: 121 mmol) with normal kidney functions, blood sugar, and arterial blood gases.
- (2) Radiological: plain radiography of the abdomen in the erect position revealed multiple air/fluid levels and pelvi-abdominal ultrasound showed colonic gases with moderate pelvic collection (Fig. 1).

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The provisional diagnosis was complicated acute appendicitis with peritonitis, and exploratory laparotomy was planned.

At abdominal exploration, moderate amount of intraperitoneal serosanguinous fluid was found, and the distal part of small intestine was entrapped and strangulated between gangrenous MD and fibrous band connecting the tip of the diverticulum and the mesentery of small intestine near the ileocecal valve.

MD was measuring approximately 10 cm in length and 4 cm in diameter.

The band was lysed with unfolding the gangrenous small bowel; the diverticulum was found about 100 cm from ileocecal valve, and gangrene of small intestine reached up to 1 cm from ileocecal valve. Gangrenous Meckel's and small intestine were resected with conservative right hemicolectomy and end-to-end ileo-colic anastomosis (Fig. 2).

Postoperatively, the patient experienced hypoalbuminemia (albumin 2.5 mg/l), hypoprothrombinemia (PC 38%, INR 2.17), and hyponatremia (Na 129 mmol/l), all of which returned to normal values after the patient started oral feeding on day 3 postoperatively.

Pelvi-abdominal ultrasound was done on day 4 postoperatively and revealed mild free fluid collection at right iliac fossa and pelvis.

Patient was discharged after 8 days of hospital stay.

Histopathological examination of the resected sample showed a large segment of gangrenous ileum and infarcted MD and cecum, with the appendix and ascending colon free of necrosis (Fig. 3).

DISCUSSION

MD is the most common congenital gastrointestinal abnormality. It results from the persistence of a portion of the omphalomesenteric duct, resulting in either a diverticulum, with or without a fibrous connection to the umbilicus, or a fistula from the small bowel to the umbilicus [1].

The three most common complications of MD are bleeding, obstruction, and inflammation. Overall, 40% of these complications occur in children younger than 10 years [3].

The most common cause of obstruction is intussusceptions with the diverticulum being the lead point. Other causes include volvulus, Littre's hernia, and diverticular strictures [2].

Axial torsion of MD is a rare complication that results from axial twisting of an MD around its narrow base. In our case, the diverticulum was attached to the small bowel mesentery near the ileocecal junction through a fibrous band, which served as an axial point for torsion, as well as allowing for part of the terminal ileum to herniate through the loop created between the MD and the small bowel mesentery, resulting in small bowel gangrene [4,5].

The correct preoperative diagnosis of MD is quite difficult, because a complicated form of this condition may be clinically indistinguishable from a variety of other intra-abdominal diseases such as acute appendicitis, inflammatory bowel disease, and other causes of small bowel obstruction [6].

One method of diagnosis is a computed tomographic scan. A blind-ended fluid or gas-filled structure in continuity with the small bowel may be seen [7]. However, in our case, computed tomographic was not readily available

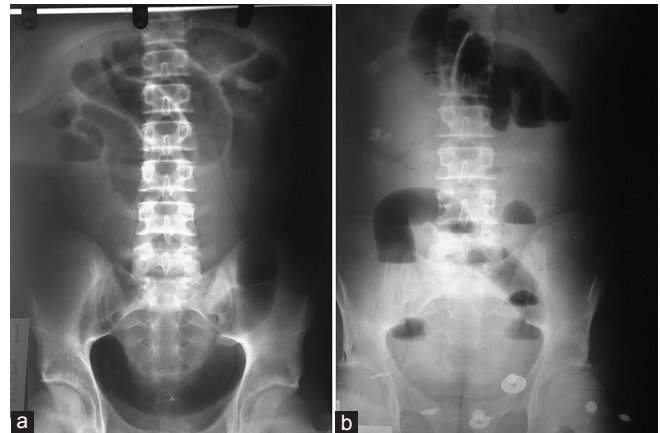


Figure 1: (a) Abdominal radiography supine showing distended loops of small intestine. (b) Abdominal radiography erect showing multiple air/fluid levels.

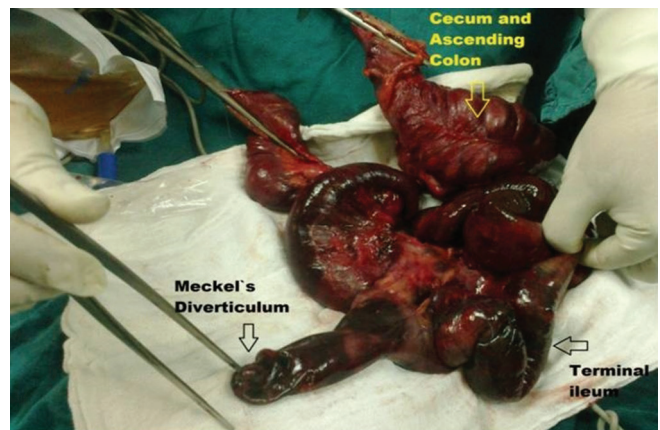


Figure 2: Resected specimen showing gangrenous Meckel's diverticulum, gangrenous small bowel loops, and part of the ascending colon.

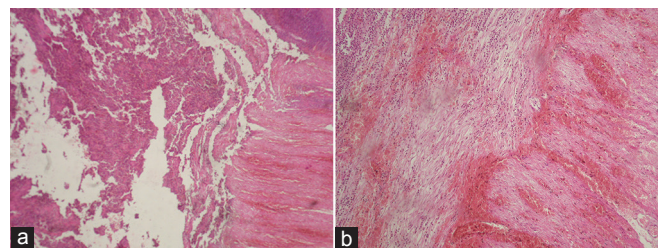


Figure 3: (a) Histopathological examination slides of Meckel's diverticulum and ileum (magnified). (b) Histopathological examination slides of Meckel's diverticulum.

and we had to rely on clinical diagnosis. A laparotomy was required in anticipation of complications or a different diagnosis.

Delay in the diagnosis and management of a complicated MD can lead to significant morbidity and mortality [8].

In our case, there was a delay in the presentation, resulting in irreversible damage to the terminal ileum, leading to the decision of small bowel resection and conservative right hemicolectomy, with higher morbidity.

CONCLUSION

This is a case report of a very rare condition of MD complicated with torsion, gangrene, and small bowel obstruction secondary to herniation through a loop between the diverticulum and small bowel mesentery, resulting in small bowel strangulation. Despite the late presentation, the patient benefited from resection of the gangrenous small bowel and conservative right hemicolectomy. He recovered well and was discharged 8 days postoperatively.

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Conflicts of interest

There are no conflicts of interest.

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