Case Report

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Meckel's diverticulum complicated by acute intestinal obstruction: a case report

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Introduction and importance: Meckel's diverticulum is a rare congenital intestinal anomaly that can sometimes cause serious complications. The authors' aim is to review the literature on this condition by reporting the clinical case of a young adult with Meckel's diverticulum complicated by acute intestinal obstruction.

Case presentation: This was a 24-year-old young man, operated on for open bladder stones received for occlusive syndrome. Abdominal computed tomography (CT) suggested a flange occlusion. Surgical exploration found a Meckel's diverticulum creating a flange around the last one. An intestinal resection was performed with direct anastomosis with simple consequences.

Clinical discussion: Meckel's diverticulum is a rare congenital intestinal anomaly. It is discovered incidentally or in the face of serious complications such as intestinal obstruction. Intestinal resection with one-stage anastomosis emerges as a standard and safe management approach.

Conclusion: A Meckel's diverticulum can be complicated by acute intestinal obstruction mimicking a postoperative flange that can err the diagnosis.

Keywords: case report, intestinal obstruction, intestinal resection, Meckel's diverticulum

Introduction

Meckel's diverticulum is a persistence of the omphalo-mesenteric canal of Vitellin. The risk of complications occurring during life is estimated at 2%, in the form of digestive bleeding, obstruction, or diverticulitis[1]. The risk of complications decreases with age. The discovery of Meckel's diverticulum is, therefore, often fortuitous in adults. Resection is indicated in the event of a complication but remains controversial in the event of an incidental discovery[2]. In this context, we present a case involving acute intestinal obstruction caused by the rolling of a Meckel's diverticulum onto the last loop, mimicking a bridle on abdominal computed tomography (CT), in a 24-year-old patient. The ileal anastomosis resection was performed, leading to successful treatment.

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Patients and methods

We carried out a retrospective study over 12 years (January 2010 to December 2022), which included all adults with

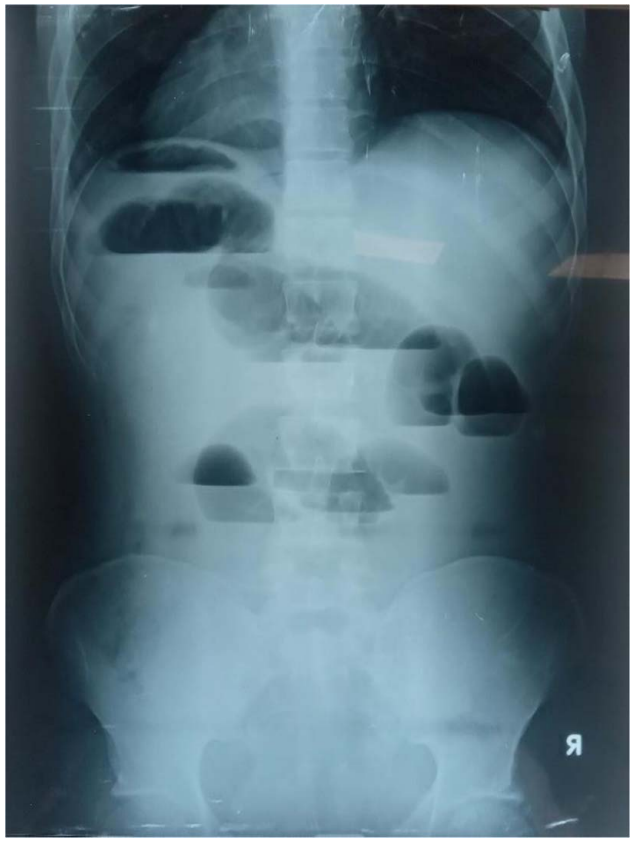

Figure 1. Hail-like fluid levels on abdominal X-ray without preparation.

complicated Meckel's diverticulum. We studied the symptoms, the clinical examination data, the emergency procedures, the treatment initiated as well as the results over 1 year of follow-up. We had 1 case during this period, which we will describe (case). This work has been reported in line with the SCARE criteria 2023[3].

HIGHLIGHTS

- Meckel's diverticulum is a rare congenital intestinal anomaly.
- Sometimes, It is discovered incidentally.
- Intestinal resection with one-stage anastomosis emerges as a standard and safe management approach.
- Asymptomatic Meckel's diverticulum remains a topic of debate.

Case

This involved a 24-year-old man with a history of bladder surgery via transverse suprapubic incision 2 years before his admission. Upon admission to the emergency room, he presented symptoms that had been evolving for 72 h, characterized by diffuse abdominal pain, cessation of bowel movements, and vomiting without fever or urinary problems. The initial examination revealed the patient to be in good general condition, with a blood pressure of 110 mmHg/80 mmHg, temperature at 37°C, pulse at 88 beats per min, good diuresis, and slight dehydration. There was discreet undefended meteorism and a 6 cm transverse solid suprapubic scar. Laboratory findings indicated normoleukocytosis at 8700/mm^3, along with hemoconcentration. Renal assessment and blood ionogram were unremarkable. Unprepared abdominal radiography revealed slender-like hydro-aerial levels (Fig. 1). The enhanced abdominal CT scan showed intestinal distention at 33 mm with a transition zone next to L5–S1, suggesting a postoperative flange without signs of intestinal distress (Fig. 2).

An exploratory laparotomy was performed, revealing a Meckel diverticulum situated 70 cm from the ileocecal angle, forming a flange between the ileum and the abdominal wall of the right iliac fossa (Fig. 3). The diverticulum measured 5 cm in length. The loops were distended upstream without necrosis, and the appendix appeared normal. The patient underwent intestinal resection with 5 cm of margins on either side of the diverticulum, followed by an end-to-end ileo-ileal anastomosis (Fig. 4). The postoperative course was uneventful, with the resumption of bowel transit on the 2nd postoperative day. The discharge occurred on the 6th postoperative day. Pathological examination of the surgical specimen revealed chronic

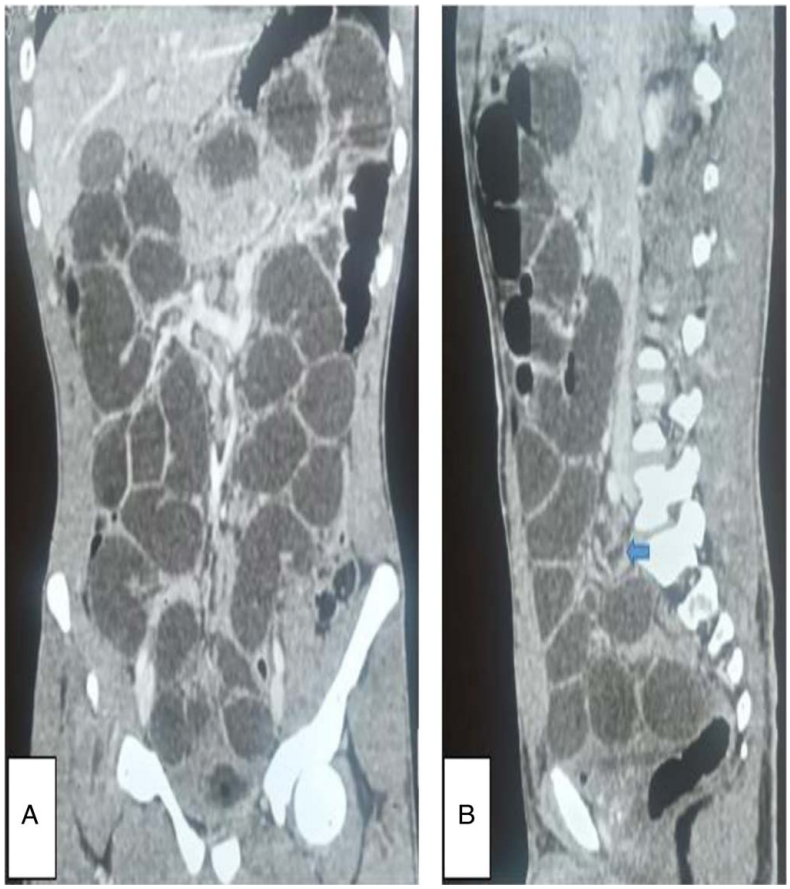

Figure 2. Portal phase computed tomography images showing distension of the small intestine (A) and a transitional zone next to L5–S1 (B, blue arrow).

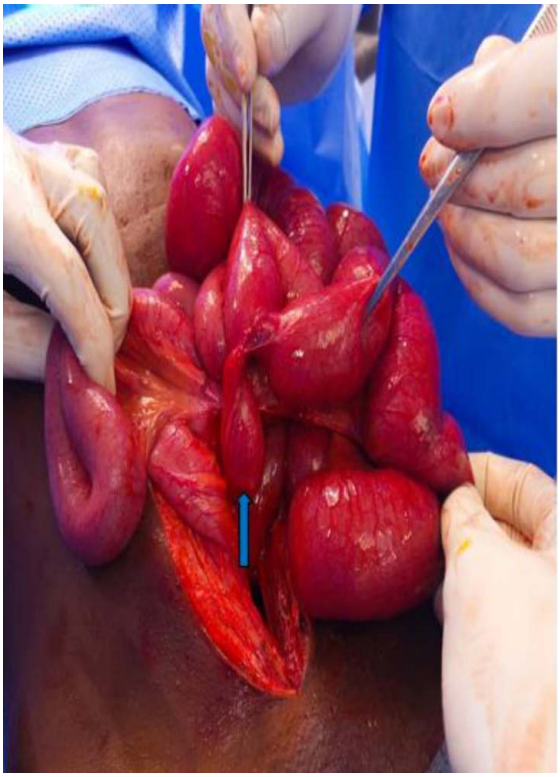

Figure 3. Intraoperative image showing Meckel's diverticulum on the last ileal loop (blue arrow).

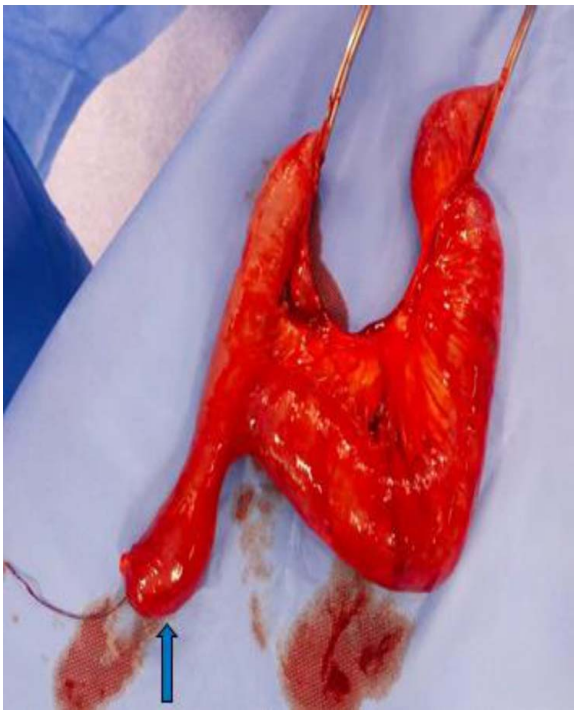

Figure 4. Intestinal resection surgical specimen removing Meckel's diverticulum (blue arrow showing the diverticulum).

diverticulitis without intestinal heterotopia or signs of malignancy. After 6 months of follow-up, the patient remained free of complications.

Discussion

Meckel's diverticulum, located between 50 cm and 150 cm from the ileocecal valve, represents a partial persistence of the omphalo-mesenteric canal[1]. Typically asymptomatic and frequently discovered incidentally, complications of Meckel's diverticulum, such as hemorrhage and ulcer, are predominantly observed in early childhood. Conversely, in adults, occlusion (34–53% of complications) and diverticulitis (13–31%) predominate[4,5]. Various factors contribute to the occurrence of complications, including male sex, age below 40 years, a diverticulum exceeding 2 cm, and the presence of macroscopic mucosal abnormalities during resection[5,6]. Preoperative diagnosis remains challenging, with conventional imaging detecting Meckel's diverticulum in only 10% of complicated cases. In our patient, a history of laparotomy and the identification of a transition zone on abdominal CT promptly suggested a postoperative bridle. The classical imaging diagnosis of Meckel's diverticulum involves opacification of the small intestine, preferably by enteroclysis (Fig. 5)[6].

Plain abdominal radiography and ultrasound lack specificity, making it difficult to differentiate between an intestinal loop and Meckel's diverticulum on CT[7]. In our case, the diverticulum formed a bridle around the last loop, facilitated

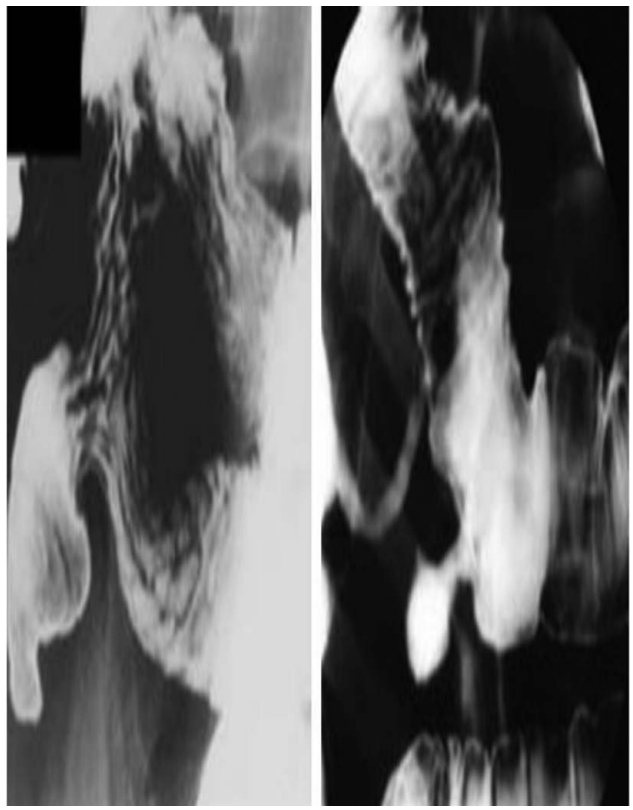

Figure 5. Image of addition implanted at right angle on the anti-mesenteric edge of the ileum corresponding to Meckel's diverticulum[6].

by its mesenteric base, free end and 5 cm length. Other reported mechanisms contributing to occlusion in Meckel's diverticulum include intussusception on an inverted diverticulum, enterolith formation, incarceration and strangulation in a parietal hernia (Littre's hernia), and tumor development[8,9].

Our patient underwent successful intestinal resection, involving diverticulum removal and anastomosis, leading to favorable short and long-term outcomes. Surgery remains the optimal approach for managing complicated Meckel's diverticula. The debate persists regarding prophylactic resection for incidentally discovered asymptomatic diverticula in adults[10]. Thirunavukarasu *et al.*[11], reported an increased risk of cancer associated with Meckel's diverticulum, suggesting diverticulectomy for incidentally discovered cases to facilitate early detection of neuroendocrine tumors and prevent dissemination. In cases of symptomatic or complicated diverticulum, ileal segmental resection with end-to-end anastomosis remains the standard treatment, allowing for the removal of a variable length of intestine on either side of the diverticulum base[12]. Diamond resection, involving removal except for the base, offers a faster technique without interrupting intestinal continuity, suitable for fortuitously discovered healthy diverticula, yet contraindicated in certain complications[13]. In cases of doubt about heterotopia, segmental resection is preferable[12,13].

Conclusion

The radiological diagnosis of Meckel's diverticulum poses challenges in young adults with a history of laparotomy. Intestinal resection with one-stage anastomosis emerges as a standard and safe management approach. While the resection of asymptomatic Meckel's diverticulum remains a topic of debate, it is generally acceptable in young adults.

Ethical approval

Not applicable. This is a case report, no ethical approval was needed. Consent of patient is sufficient.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

A.N., A.N. conceived the study, collected, analyzed data. A.N., A.N., A.N., P.S.D., M.D. drafted the manuscript. M.C., M.D. and I.K. edited and reviewed the manuscript.

Conflicts of interest disclosure

None.

Research registration unique identifying number (UIN)

Trial registry and the registration number
1. Name of registry: researchregistry.com.
2. Number of registry: 9943.
3. Hyperlink: https://researchregistry.knack.com/research-registry#user-researchregistry/registerresearchdetails/65ae40db89849e0029a717f4/.

Guarantor

The corresponding author (A.N.) is the guarantor of this study. He accepted full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

Data availability statement

Any datasets generated during and/or analyzed during the current study are publicly available, available upon reasonable request.

Provenance and peer review

Not commissioned, externally peer-reviewed.

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