

Case Report

Meckel's diverticulitis with abscess presentation in an acute abdomen

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Received: 13 February 2023
Accepted: 21 February 2023
Epub Ahead of Print: 13 March 2023
Published: 26 July 2023

DOI

10.25259/CRCR_15_2023

Quick Response Code:



ABSTRACT

The vitellointestinal/omphalomesenteric duct is embryonic structure connecting primary yolk sac to the embryonic midgut which obliterates by 10th week of gestation. It may persist or incompletely obliterate to form anomalies like Meckel's diverticulum that is most common and is usually asymptomatic. Symptoms develop when Meckel's diverticulum involves complications such as hemorrhage, inflammation, and perforation, or when it causes intussusception or bowel obstruction. The modalities useful in diagnosing it are ultrasonography (USG) and computed tomography (CT), USG being more easily available, and radiation free is the first modality useful to suspect these anomalies. It can mimic close differentials such as appendicitis and urachal anomalies. In this case report, a 12-year-old male child presented with recurrent periumbilical pain who was screened on USG was suspected Meckel's diverticulitis with abscess; the same was confirmed on contrast CT scan and managed surgically. This case shows the importance of USG and radiologist's suspicion of Vitellointestinal duct anomalies in diagnosing and its associated complications.

Keywords: Vitellointestinal/omphalomesenteric duct, Meckel's diverticulitis, Ultrasonography, Ileal loops

INTRODUCTION

The vitellointestinal/omphalomesenteric duct (OMD) is the embryonic structure connecting primary yolk sac to the embryonic midgut. It becomes a thin fibrous band, which eventually disintegrates and is absorbed spontaneously at the 5–10th week of gestation.^[1,2] If it fails to disintegrate, it forms that anomalies include Meckel's diverticulum, omphalomesenteric fistula, fibrous bands, cysts, and umbilical polyps. Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract and is usually asymptomatic.^[1,3] In our case report, we study the imaging features of Meckel's diverticulum when infected, especially on ultrasonography (USG), differentiate from close differentials like urachal cyst, and appendicitis on imaging and to correlate with intraoperative findings.

CASE REPORT

A 12-year-old male child presented with complaints of abdominal pain at umbilical region and multiple episodes of vomiting. He had low-grade fever and had h/o similar episodes 1 month back, for which he was treated conservatively, which was recurring for 1 year. His total leukocyte counts were elevated. The patient was sent for emergency USG with suspicion of perforated appendicitis by the surgeon. On per abdomen USG using high-frequency linear (8–12 MHz)

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probe, there was a collection with multiple air foci within and surrounding fat stranding in abdomen at periumbilical region in median plane. A tubular like structure with gut signature was seen arising from antimesenteric border of ileal loops and opening into the collection [Figure 1]. It was seen reaching up to posterior rectus sheath of anterior abdominal wall at umbilicus without opening externally. Appendix was normal. The patient was taken for contrast-enhanced computed tomography (CT) scan which showed collection along the posterior rectus sheath of anterior abdominal wall at umbilicus with adherence to ileal loops and umbilicus. A fibrous cord like structure was seen connected to dome of urinary bladder [Figure 2]. Rest of abdomen was unremarkable. The radiological diagnosis of Meckel's diverticulitis with abscess formation adherent to ileal loops and anterior abdominal wall was made. A less likely possible differential of infected urachal cyst adherent to posterior rectus sheath and underlying ileal loops could be considered due to a fibrous band like structure seen connecting to dome of urinary bladder on contrast-enhanced computed tomography (CECT), but the gut like tubular structure arising from antimesenteric border of ileum on USG made us to finalize on diagnosis of Meckel's diverticulitis with abscess. The patient was surgically managed by laparotomy with excision of Meckel's diverticulum and obliterated urachus with ileoileal anastomosis. A Meckel's diverticulum communicating from ileal antimesenteric border [Intraoperative Figure 3] and thickened obliterated urachus which was noted on CT which was seen intraoperatively. A collection of 20 cc was drained. There were no urachal anomalies. Postoperatively, the patient was fine. The histopathology report was confirmed as Meckel's diverticulum having all layers of intestine with ectopic gastric mucosa.

DISCUSSION

Meckel's diverticulum is usually asymptomatic, symptoms develop when Meckel's diverticulum involves complications such as hemorrhage, inflammation, and perforation, or when it causes intussusception or bowel obstruction.^[1,2] Hemorrhage is the most common and early complication of Meckel's diverticulum due to ectopic gastric mucosa. ^{99m}Tc-Na-pertechnetate scintigraphy helps in the diagnosis of Meckel's diverticulum as it is taken up by mucin secreting cells of the ectopic gastric tissue in Meckel's diverticulum.^[2] It can mimic such as appendicitis and urachal anomalies enteric duplication cyst. Appendix needs to be examined properly and ruled out as normal. In urachal anomalies, there will communication or connection with lumen of urinary bladder and absence of gut signature and peristalsis of Meckel's diverticulum.^[2] In our case, also less likely possible differential of infected urachal cyst with secondary could be thought of due to a fibrous band like structure seen connecting to dome of

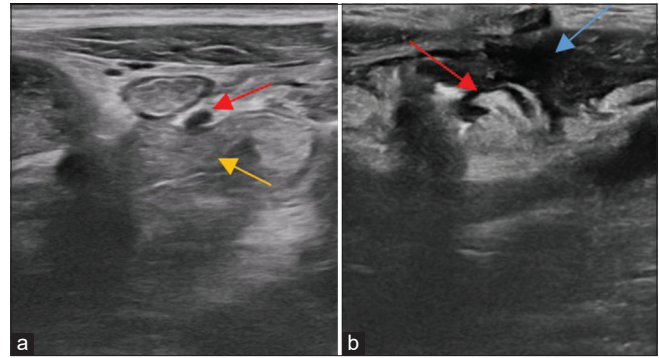


Figure 1: A hypoechoic tubular structure (red arrow) is seen arising from anti-mesenteric border of ileum (yellow arrow) in image (a). This tubular structure is traced from the ileum toward posterior rectus sheath, it is seen opening in collection (blue arrow) in image (b).

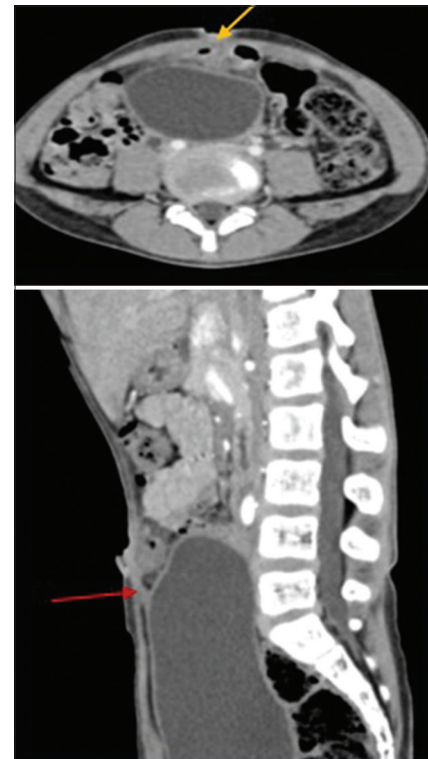


Figure 2: On contrast-enhanced computed tomography axial view, collection (yellow arrow) is noted in periumbilical region adherent to ileal loops. On sagittal view, collection is seen and also a fibrous cord like structure (red arrow) is seen connected to dome of urinary bladder.

urinary bladder on CECT, but the gut like tubular structure arising from antimesenteric border of ileum on USG made us to finalize on diagnosis of Meckel's diverticulitis. Since OMD anomalies and urachal remnants can involve the umbilicus, differentiation at sometimes may be difficult.

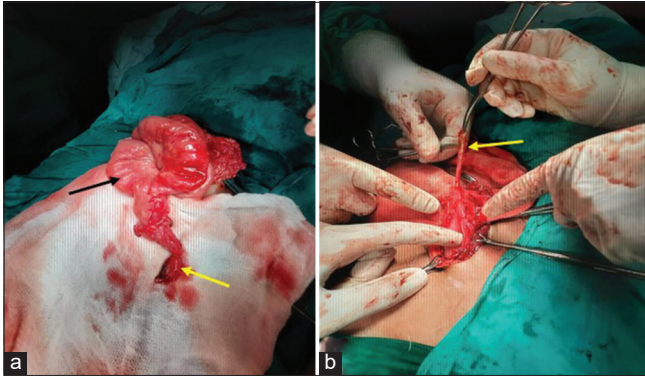


Figure 3: (a and b) Intraoperative images showing Meckel's diverticulum in yellow arrow communicating with ileal loops (black arrow).

Table 1: Major differentials for Meckel's diverticulum.

S. No.	Differential diagnoses
1.	Appendicitis
2.	Enteric duplication cyst
3.	Urachal anomalies such as patent urachus, urachal cyst, and urachal diverticulum
4.	Ileal diverticulitis
5.	Regional enteritis

In urachal remnant anomaly, it is usually directed from umbilicus toward the urinary bladder, but, in Meckel's diverticulum, it is toward the ileum. Enteric duplication cyst can be differentiated by its origin from mesenteric border of bowel and does not communicate with bowel lumen.^[2] Other abdominal and pelvic pathologies that are differentials are shown in Table 1.

USG and CT are commonly used for the evaluation of patients with complications such as obstruction and inflammation.^[2-4] Mechanism of obstruction by Meckel's diverticulum is due to internal hernia secondary to a mesodiverticular band which runs from root of mesentery to antimesenteric border of diverticulum or by volvulus, it acts also as lead point for intussusception due to lymphoid hyperplasia at its base.^[5] Meckel's diverticulitis usually mimics as appendicitis clinically.^[2] Rule of 2 in Meckel's diverticulum is, it is seen in 2% population, 2 inch long, 2 feet from ileocecal junction, two-third have ectopic mucosa, and two types of mucosa seen (gastric and pancreatic) and usually presents by 2 years of age. The importance of type of ectopic mucosa relies on pathologies developing from it like presence of ectopic gastric mucosa is prone for *Helicobacter pylori* ulcers, or peptic ulcers in Zollinger Ellison syndrome and hemorrhage. Ectopic pancreatic tissue can lead to rare complications like neuroendocrine tumor. Likewise, other rare ectopic tissues can be jejunal, duodenal mucosa, endometriosis or hepatobiliary, and pathologies related to

it.^[6] USG is useful in diagnosing OMD anomalies as we can trace the structures in real time and easily available. However, the experience of radiologist on the USG plays a key role. In case of complicated cases to rule out other pathologies, cross-sectional imaging like CT scan may be helpful.^[2]

CONCLUSION

In a pediatric patients presenting with acute abdomen, Meckel's diverticulum and related complications should be kept in our differentials especially when presenting with complaints around umbilicus and RIF. It can mimic as other pathologies which need to be differentiated. The clinical suspicion and radiologists skills help in the early diagnosis and appropriate management.

TEACHING POINTS

VID anomalies like Meckel's diverticulum and its complications should be ruled out on emergency USG while examining pediatric acute abdomen.

MCQs

- The Vitellointestinal/omphalomesenteric duct (OMD) is embryonic structure connecting primary yolk sac to the embryonic
 - Foregut
 - Mid gut
 - Hind gut
 - Cloaca

Answer Key: b

- Most common and early complication of Meckel's diverticulum in children is
 - Infection
 - Obstruction
 - Hemorrhage
 - Malignancy

Answer Key: c

- Meckel's diverticulitis usually mimics clinically as
 - Enteritis
 - Cystitis
 - Appendicitis
 - Cholecystitis

Answer Key: c

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Suraparaju Varaprasadvarma P, Pawar A, Rote Kaginalkar V. Meckel's diverticulitis with abscess presentation in an acute abdomen. *Case Rep Clin Radiol* 2023;1:127-30.