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Case Report

Intermittent subacute obstruction of small bowel by Giant Meckel's Diverticulum- a case report ☆☆☆☆

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ABSTRACT

Meckel's diverticulum is the most common congenital anomaly of gastrointestinal tract, which results from incomplete involution of the proximal part of the vitelline duct during weeks 5-7 of fetal development. Giant Meckel's diverticulum more than 5 cm in length is relatively rare and may be associated with small bowel obstruction. Here we report Giant Meckel's diverticulum in 11 year old male who presented with the symptoms of acute abdomen with intermittent subacute small bowel obstruction. Patient presented with muscle guarding and tenderness. CT abdomen revealed a large outpouching round lesion in distal ileum intermittently compressing the small bowel that was suggestive of Giant Meckel's diverticulum. The morphology, pathology and complications of Giant Meckel's diverticulum is important for radiologist and surgeons for successful management of patient.

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Introduction

Meckel's diverticulum is the most common congenital anomaly of gastrointestinal tract with an average length of 3 cm [1,2]. This prevailing abnormality usually varies in size from 1 to 10 cm [3]. Cases of Giant Meckel's diverticulum more than 5 cm in length are rare and linked with serious complications, mostly obstruction [4,5]. Meckel's diverticulum com-

monly exhibits as gastrointestinal bleeding in pediatric population and as intestinal obstruction in adults [6].

Although Meckel's diverticulum is most commonly diagnosed congenital gastrointestinal tract anomaly, it affects only 2% of population worldwide [7]. Surgical treatment of Meckel's diverticulum by both open and laparoscopic procedures has led to the clinical "rule of 2" for symptomatic cases, by which the anatomical deformity is most often located 2 feet from the ileocecal junction and is 2 inches long [8].

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Fig. 1 – Post contrast axial image showing oval lesion in pelvis denoted by red arrows.

Distal small bowel diverticulosis is an atypical finding, and most are in the duodenum and jejunum. Large ileal diverticula are intensely rare [9]. Both the pediatric and adult patients with complex Meckel's diverticulum may develop small bowel obstruction and present with colic abdominal pain, vomiting and distension. The process of obstruction can be intussusception of an inverted Meckel's diverticulum, volvulus or strangulation of distal ileum by the fibrous band connecting the diverticulum keeping retained foreign objects, enteroliths or a tumor [10].

Here we report an unusual case of Giant Meckel's diverticulum presenting with intermittent subacute obstruction in an 11 year old male.

Case report

An 11 year old male patient was referred for CT imaging for an acute abdomen. He complained of recurrent episode of pain in abdomen, 8-10 episodes of vomiting and mild distension of the abdomen. Most of the episodes responded to conservative management. However, this time the symptoms were more acute and associated with fever.

On examination, there was mild distension of abdomen and tenderness on palpation with muscular guarding. Bowel sounds were normal, and no signs of peritonitis were present. The patient was febrile, laboratory testing showed mild elevated count.

CT scan of abdomen was performed on 16-slice MDCT Siemens Scanner. 100 mL nonionic iodine contrast was given orally and then non-contrast and contrast enhanced images were obtained. Additional images were obtained after positive oral contrast administration and delayed images were obtained after 90 minutes.

A CT scan of abdomen and pelvis revealed a round lesion that was outpouching through small intestinal wall in distal ileum, which was suggestive of diverticulum. The lesion was placed in pelvis with well-defined enhancing thin wall and air fluid levels within. Mild ascites was noted (Fig. 1 and Fig. 2).

Post-oral contrast image showed opacification of the lesion with positive contrast confirming connectivity with the bowel loops with a wide neck of communication (Fig. 3 and Fig. 4). These findings were suggestive of Giant Meckel's diverticulum

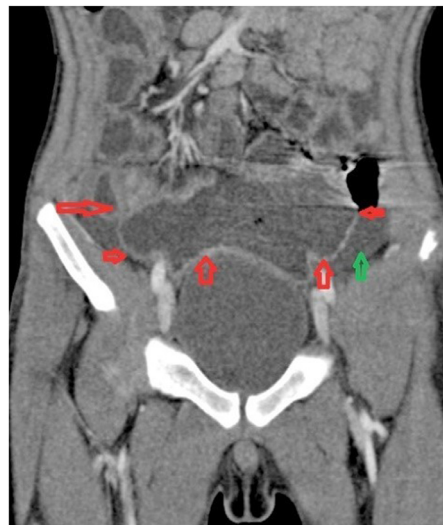


Fig. 2 – Post contrast coronal reformat showing the oval lesion in pelvis with well-defined enhancing thin wall (denoted by red arrows). The lesion shows air fluid levels within. Mild ascites is denoted by green arrow.



Fig. 3 – Sagittal reconstructed image after oral positive contrast administration showing large diverticulum with communication with bowel loop. Note air fluid level in anterior portion of diverticulum.

measuring about 7.2 cm in length with a circumference of 5.3 cm. Due to its giant size and mass effect; it was probably producing intermittent obstruction of small bowel as well as a source of infection.

A diagnosis of Giant Meckel's diverticulum with intermittent subacute small bowel obstruction was confirmed.

Emergency laparotomy was performed under general anesthesia, which revealed oedema throughout the entire small bowel. There were few dilated bowel segments present. A Giant ileal diverticulum about 7.2 cm in length and 5.2 cm of circumference was present on the antimesenteric border of small bowel at 70 cm proximal to the ileocecal valve. The diverticulum was not adherent to the parietal peritoneum of the abdominal wall at the pelvis but was adherent to few segments of small bowel. The diverticulum was compressing on few loops of small bowel due to its giant size. The compression was released, the diverticulum was freed from the adhe-

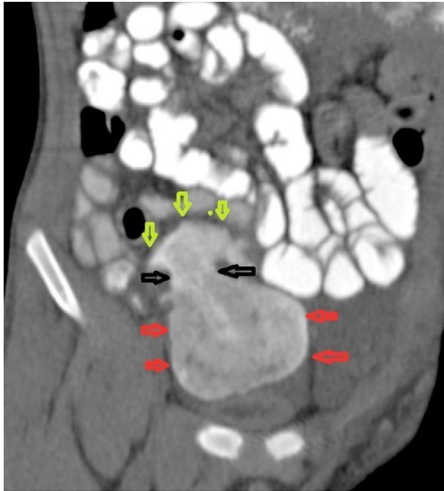


Fig. 4 – Coronal reformat image of oral contrast phase showing outline of lesion (denoted by red arrows) and its connection with ileal loops in pelvis (green arrow demonstrates ileal loop). Also, note the wide neck of communication (denoted by black arrows).



Fig. 5 – Showing the post-operative image of giant meckel's diverticulum with a small segment of ileum.

sions of small bowel and the Giant Meckel's diverticulum was resected along with a small segment of ileum (Fig. 5).

The remaining intestinal segment was restored. The patient was discharged on postoperative day 8 without any complications. Histopathological examination of the specimen was reported as Giant Meckel's diverticulum with hyperplasia of lymphoid tissue.

The patient was followed up one week after discharge and had no complaints.

Embryological aspect

After 7th week of intrauterine life, the vitello-intestinal duct and the secondary yolk sac (omphalomesenteric duct), undergo regression and complete reabsorption. Both these structures lie in the extraembryonic coelom, surrounded by embryonic mesenchyme.

Ultimately, the secondary yolk sac is compressed onto the chorionic surface of the placental plate by expanding the amnion and its fusion with the chorion. At the distal end of the vitelline duct, the secondary yolk sac progressively shrinks in size and is seen as a discrete pale yellow discoid tissue mass on the amniotic surface of the placental plate, near the insertion site of the umbilical cord [3].

Discussion

Meckel's diverticulum is a true diverticulum, which was first described by Johann Friedrich Meckel in 1809. It is typically situated up to 100 cm away from the ileocecal valve and occurs in 2% of general population with an average size of 3 cm. Giant Meckel's diverticula are defined as diverticula measuring more than 5 cm [1]. In our case, there was Giant Meckel's diverticulum as it was measuring about 7.2 cm in length and 5.2 cm in circumference.

Males are prone to suffer from complications, which occur twice as common when compared with females. 50% of these complications are observed in people under the age of ten years and it seems as the frequency declines with age [3]. In our case patient was male of 11 years.

Long Meckel's diverticulum has been affiliated with enteroliths and are susceptible for obstructions [6]. In our case patient had intermittent subacute obstruction of small bowel.

In adult case of Meckel's diverticulum obstruction is the most often reporting presenting symptom. Though first hypothesized in 1902 these possible reasons for Meckel's diverticulum caused intestinal obstruction to remain the hallmark by which Meckel's diverticulum cases are classified. The obstruction allied with a free or unattached diverticulum or having only one attachment to the intestine represent first Meckel's diverticulum type and obstructions allied with an attached diverticulum, including through its terminal ligament, to the abdominal wall or intestinal viscus represents the second type. Between these two types, former is much rarer [7]. In our case, it was Giant Meckel's diverticulum and can be categorised into first type, as it was unattached diverticulum to the abdominal wall.

Congenital diverticula are true diverticulum that consists of all layers of the intestinal wall, including the muscular layer. This contrasts with false diverticula, which occur when only the mucous membrane and submucosa protrude through a weak point in the intestinal wall [9,10].

Complicated Meckel's diverticulum may be clinically inappreciable from variety of other intraabdominal diseases such as acute appendicitis, inflammatory bowel disease or other causes of small bowel obstruction. Process of the obstruction comprises, enlargement of the small bowel around a fibrous

band attached to the umbilicus, entrapment of an intestinal loop, intussusception, volvulus or stenosis [10].

In our case, the Giant Meckel's diverticulum presented with wide neck and was causing intermittent subacute small bowel obstruction. Other complications such as ischaemia of intestinal wall, volvulus, stenosis or intussusception was not present. Hence, the patient underwent laparotomy and diverticulectomy was done.

Conclusion

Our case exemplifies a rare case of Giant Meckel's diverticulum leading to intermittent subacute small bowel obstruction. Comprehension of morphology, pathology and symptoms caused by Giant Meckel's diverticulum is of importance to surgeons, gastroenterologist, pathologist and radiologist. Our case describes novel insights of Giant Meckel's diverticulum and its successful management by surgical resection.

Patient consent

Patient have no objection to any of the above and give permission for the same.

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