Gangrenous Meckel's diverticulum in a child patient: A case report

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Abstract

Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract in humans, occurring in about 2% of the general population. In this report we present nine year old male child from Al Mosul city who attended Al Zahrawi Private Hospital with history of abdominal pain for few hours duration which was gradually in onset started around the umbilicus and then distributed to the lower abdominal pain, the pain was so sever in intensity and get worse by movement and breathing associated with fever and vomiting. Physical examination and routine investigations have been done which revealed acute abdomen. The patient sustained a surgical operation and the gangrenous part of the intestine was resected with end to end anastomosis.

Case Report

Nine years old male child from Mosul City admitted to the emergency Department of Al – Zahrawi Private Hospital with a history of lower abdominal pain for one day duration. The pain was steady and localized in the right lower quadrant associated with fever and vomiting. The past medical and surgical histories were un contributory. Personal and family histories were un remarkable.

Physical examinations revealed an alert, oriented, dehydrated child in sever abdominal distress. Vital Signs were: Temperature 38.7 c, pulse rate of 120 beats/ minute, blood pressure of 90/ 65 mm Hg. His oral mucosa and tongue were dry. The head and neck examination was normal. Examination of the heart and lungs was normal. The abdomen was distended with high pitched bowel sounds and was markedly tympanic on percussion. The right lower quadrant was very tender with rebound tenderness. Pelvic and rectal examinations were normal.

The General Urine Examination and Haemoglobin were normal, The W.B.C was elevated 12,000/ cu mm. The plain X- ray of the abdomen didn't show any evidence of fluid level. With these clinical, radiological and laboratory findings, an acute surgical abdomen was diagnosed.

On laparatomy, a giant Meckels diverticulum (Figure1), was found to have undergone axial volvulus resulting in strangulation (Figure 2).The segment of the ileum bearing the volvulized Meckels diverticulum was resected (Figure 3), and end to end anastamosis of the ileum was performed.

The post operative course was uneventful and the patient was discharged on the fifth post operative day. The final pathology report revealed a Meckels diverticulum that had undergone axial volvulus resulting in strangulation. No tumour or ulcer was noted in the resected specimen.

Discussion

Meckels diverticulum is a true intestinal diverticulum that result from the failure of the vitelo intestinal duct to obliterate during the fifth week of fetal development. It contains all normal layers of the intestinal wall and, in approximately 50% of cases, contains tissue from other sites (ectopic tissue). This ectopic or heterotopic tissue can often be the cause of complications occurring in Meckels diverticulum (1).

Meckels diverticulum occurs in about 2% of the population. Making it the most prevalent congenital abnormality of the gastrointestinal tract. It can be a symptomatic or mimic common abdominal disorders such as Crohns disease, appendicitis, and peptic ulcer diseases (2).

Many primary care physicians have never seen a patient with this abnormality, and the management involves a sometimes controversial decision about whether to surgically remove an incidentally discovered Meckels diverticulum (3).

Heronymus Fabricus was the first to describe a distal ileal diverticulum in 1598 (3). But the first detailed description of the ileal diverticulum with elucidation of its embryologic significance was made by Johann Friedrick Meckel (the younger) in 1809, hence diverticulum bears his name (4).

Prior to the development of the functioning placenta, the main source of nourishment for the early human embryo is from the yolk sac. The communication between the yolk sac and the embryonic gut is called the vitalline (omphalomesenteric) duct.

Normally involution and obliteration of the vitalline duct occurs between the fifth and seventh week of gestation (3).

Failure of this process of involution occurs in about 2% of human beings. The persistent vitalline duct anomaly is considered as the most common congenital anomaly of the gastrointestinal tract (5). Failure of closure of the entire vitalline duct results in an umbilical – fecal fistula. Proximal closure of the vitelline duct results in an umbilical sinus, whereas distal persistence of the vitelline duct results in Meckels diverticulum. Meckels diverticulum is on the antimesenteric border of ileum approximately 60 cm proximal to the ileocecal valve and is about 5 cm in length. Being a congenital diverticulum, it bears all three layers of the intestinal wall (a true diverticulum) with its own arterial blood supply from the ileocolic artery, a branch of the superior mesenteric artery. Heterotopic tissue (gastric, pancreatic or both) may be present in 15 to 50% of specimens and tumour occurrence in the diverticulum is noted in 1 to 3% (6).

The diverticulum may remain dormant and un suspected until accidentally discovered at necropsy. In life, small bowel contrast studies, laparotomy or laparoscopy for un related reasons may bring this entity to light.

Also complication primarily resulting from Meckels diverticulum (ie. Bleeding, obstruction, inflammation, perforation etc.) will draw clinician's attention to this organ.

In the analysis of specific complications arising from Meckels diverticulum of 1605 collected cases by Moses, the frequency of complications were, intestinal obstruction in 35% cases, bleeding in 32%, diverticulitis in 22%, umbilical fistula in 10% and miscellaneous findings (hernia, tumour, volvulus, etc) in 1% of cases (7).

Isolated spontaneous axial volvulus of Meckels diverticulum is extremely rare and results in rapid progression to strangulation (8).

Usually long diverticulum with a narrow base predisposes it to volvulus. A volvulus is an abnormal tortion of a viscus organ that can be organoaxial or mesoaxial. The sigmoid colon is the most common intra abdominal hollow viscus to undergo a volvulus where as Meckels diverticulum probably the most un common intra abdominal counterpart to undergo volvulus (4,5).

Meckels diverticulum is unique in that it exhibits both organoaxial and mesoaxial mechanisms of tortion in the same setting. This results in a dual problem of closed loop formation and circulatory compromise of the viscus leading to rapid progression to strangulation. Primary neoplasms of Meckels diverticulum are rare, seen in only 1 to 3% cases. Benign tumours arising from Meckels diverticulum may predispose the organ to volvulus. Leiomyoma is the most common benign tumour arising from the Meckels diverticulum (9).

diverticulum may be less likely to predispose the organ to volvulus because of their Whereas fibroma rankes second(10).

Malignant tumours (adenocarcinomas, carcinoids and sarcomas) arising from Meckels infiltrating nature (11).

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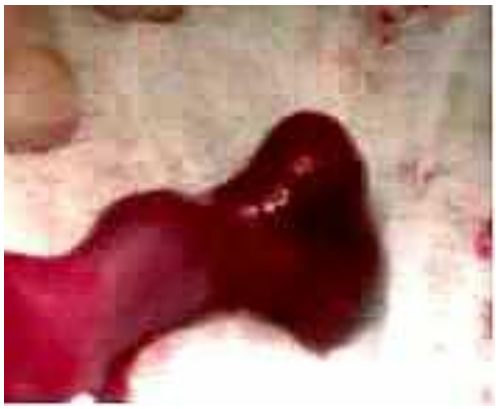

Figure 1: Meckel's Diverticulum.

Figure 2: Strangulated gangrenous ileum.

Figure 3: Resection of strangulated segment.