

## Case Report

### **A Case of Strangulated Small Bowel Obstruction Due to Mesodiverticular Band of Meckel's Diverticulum in an Adult**

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**Abstract:** Meckel's diverticulum (MD) first explained by Fabricius Hildanus and later named after Johann Friedrich Meckel, is a vestigial part of omphalomesenteric duct and an uncommon cause of small bowel obstruction in adults. We present a case of a 36 yr old male, who developed a strangulated intestinal obstruction caused by a mesodiverticular band (believed to be a remnant of a *vitelline artery*) of a MD. Because of the rarity of this anatomic anomaly in adults, we find the case of interest. To our knowledge, this mechanism of obstruction by Meckel's has been reported only thrice in English medical literature.

**Keywords:** Meckel's diverticulum, Gangrene, Intestinal obstruction, Mesodiverticular band

#### **INTRODUCTION**

Meckel's diverticulum (MD), considered as the most prevalent congenital anomaly of the gastrointestinal tract, affecting 2% of the general population, originates from failure of the vitelline duct to obliterate completely [1]. Only 4% of patients with an MD develop complications that include bleeding, perforation, inflammation, or small bowel obstruction (most common presentation in adults) [2]. MD occurs with equal frequency in both sexes, but symptoms from complications are more common in male patients. Obstruction related to an MD is most commonly reported secondary to intussusception or a volvulus around an attachment to the abdominal wall. Involvement of the mesodiverticular band of the diverticulum is uncommon and has been reported previously only thrice in literature [3,4]. Mesodiverticular band formation and consequent adjacent small bowel loop incarceration by the band is a very rare cause of obstruction. Our case report presents the intricate diagnosis and management of a small bowel obstruction due to mesodiverticular band of a MD.

#### **CASE REPORT**

A 36 yr old male patient presented with complains of colicky pain abdomen since 3 days with constipation, bloating feeling, distension, nausea and vomiting. Patient gave history of fever and obstipation since 1 day and was being treated in a private hospital. Patient had a similar episode of pain abdomen around 3 months back and was treated conservatively. No history of previous abdominal surgeries or co-morbid disease. On examination, patient was dehydrated and febrile, with tachycardia (110/min) and tachypnoea (24/min) with BP measuring 108/70 mm Hg. Per abdomen examination showed distension, tenderness all over with guarding and rigidity. No clinical evidence of free

fluid in the abdomen and bowel sounds was exaggerated. Rectum was empty and roomy. Laboratory investigations revealed leukocytosis (18,900 cells/mm<sup>3</sup>; 82% neutrophils), raised ESR, hyponatremia, raised serum creatinine and urea (1.7 and 106). Plain erect X-Ray of abdomen showed grossly dilated small bowel loops with multiple air fluid levels and paucity of gas in colon. USG abdomen revealed hypermotile bowel with signs of small bowel obstruction and evidence of minimal free fluid intraperitoneally. Ct abdomen (non-contrast) did not throw much light about the possible cause of small bowel obstruction.

Patient was catheterized and nasogastric tube inserted and started with intravenous fluid resuscitation, electrolyte correction was done and put on broad spectrum antibiotics and shifted to operating room. Midline laparotomy incision was taken under general anesthesia. Free fluid aspirated. On inspecting the bowel, there was a band adhesion from the fundus of the gangrenous MD, adhered to the mesentery of the ileum (*'mesodiverticular band'*) and created an incarcerated strangulated fold in the proximal ileal loop (ileal trapped within the loop created by the mesodiverticular band) (Fig 1). The diverticulum was 65 cm away from ileocaecal junction measuring 6 cm in length and 7 cm in diameter at maximum. After separating the mesodiverticular band from the mesentery, the ileal loop (gangrenous) was released (Fig 2). Resection of the MD along with the unhealthy ileal part (proximal 10 cm) and functional end-to-end anastomosis of the bowel (double layered suturing) were performed. The diverticulum was confirmed as MD by histological examination. Thorough peritoneal wash was given. Post-Operative recovery was uneventful.



**Fig- 1 :**At the time of laparotomy, before release of the entrapped small bowel within the loop of MD and Mesodiverticular band



**Fig-2 :**After release of the strangulated small bowel, the mesodiverticular band can be clearly visualized

#### DISCUSSION:

MD was originally described by Fabricius Hildanus in 1598. However, it is named after Johann Friedrich Meckel, who established its embryonic origin in 1809 [5]. MD, the most common congenital anomaly of gastrointestinal tract with a reported incidence of 2-3% at autopsy, represents a persistence of vitellointestinal (omphalomesenteric) duct, and is a true diverticulum containing all layers of the bowel wall, consisting of a blind diverticular pouch arising from the ileum usually 30-100 cm proximal to the ileocaecal valve. It measures approximately 5 cm and is situated on the ante-mesenteric border of the ileum. In a large series, of MD found during the operation, from a single institute over 52 yrs, Park *et al.* have noted that 84% were asymptomatic and 16% were symptomatic [6]. The frequency of symptomatic MD decreased with age. Most cases of MD are asymptomatic, and the estimated risk of developing lifetime complications of MD is around 4% [7], 40% of which occur in children younger than 10 yrs, usually present with gastrointestinal bleeding. Adults develop obstruction and, less

frequently diverticulitis. The frequent complications of MD are hemorrhage, intestinal obstruction and diverticulitis. Elsayes *et al* [8] noted that bowel obstruction of various types' accounts for up to 40% of symptomatic MD, in the adult population.

A Meckel's diverticulum may result in small bowel obstruction by a variety of mechanisms : most common being intussusception and volvulus; other causes include inflammatory adhesions, incarceration within a hernia sac (Littre's hernia) and diverticular strictures; unusually, foreign body, entangling a loop of small bowel around a fibrous cord or within a mesodiverticular band, enteroliths or neoplasm [2] may be the cause. Correct diagnosis of MD before surgery is often 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, or other causes of small bowel obstruction [9]. Small bowel obstruction is usually demonstrable on plain films of the abdomen and also the cause might be shown by CT. Although barium studies of the small bowel are relatively insensitive for the detection of Meckel's diverticulum, CT enteroclysis is an alternative to conventional CT if a small bowel lesion is suspected (demonstrated in 11 of 13 patients with gastrointestinal bleeding in a cohort[ 10]. In our case, patient's condition, and also technical difficulties, did not permit us to obtain. Arteriography and technetium pertechnetate scanning are useful only if there is significant bleeding or ectopic gastric mucosa [11]. Lastly, laparoscopy, as a diagnostic tool in cases of symptomatic MD, has also been reported [5]. Delay in the diagnosis of a complicated MD can lead to significant morbidity and mortality [12]. Of the patients operated on for complications of MD, the cumulative incidence of early postoperative complications is 12%, including mainly wound infection (3%), prolonged ileus (3%), and anastomotic leak (2%).

#### CONCLUSION:

Our case illustrates, a rare cause of intestinal obstruction by MD (small bowel entrapment by mesodiverticular loop). Although MD is the most prevalent congenital abnormality of the gastrointestinal tract, it is often difficult to diagnose. MD and its complications should be kept in mind in patients with atypical presentations and in differential diagnosis of small bowel obstruction. Correct diagnosis of MD can only be made during surgery. Early surgery is important for a good outcome.

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