

Case report:

Small Bowel Obstruction due to Meckel's Diverticulum: A Case Report

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Abstract

Background: Meckel Diverticulum is the most common congenital gastrointestinal malformation, which is 40% of cases have symptoms of intestinal obstruction. The prevalence of this disorder is between 1% and 4% of the population and the possibility of its occurring in men is twice that women. Most of Meckel diverticulums are asymptomatic so it is difficult to diagnose properly the Meckel diverticulum before surgery it may not be detectable because of other intra-abdominal complications such as appendicitis, inflammatory bowel disease, or other causes of small bowel obstruction, **Case Report:** The patient was a 28-year-old man who had abdominal pain with repeated vomiting two days earlier. In abdominal and pelvic CT scans, the dilatation of small bowel loops with screw loops around the arterial origin and upper mesenteric vein and the mesenteric root has been reported. Due to the lack of clinical improvement, the patient was transferred to the operating room for laparotomy. In the operating room, a large adhesive band of about 60 cm of the ileocecal valve was released, and the broad and inflamed diverticulitis was removed at a base of about 2 to 2.5 cm. **Conclusion:** Detecting Meckel's diverticulum with no sign from normal colon using a CT scan is difficult, but laparoscopy as a useful tool in the diagnosis of Meckel's diverticulum has been reported. The care standard of Meckel's diverticulum is a surgical procedure for the removal of complications. Surgical methods used include simple diverticulectomy or removing part of the ileum that diverticulum is located. For proper diagnosis especially in patients with unusual symptoms, It is necessary that the symptoms of diverticulum are considered

Keywords: Meckel diverticulum, Small Bowel Obstruction, Mesodiverticular band

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Introduction:

The small bowel obstruction is responsible for about one-fifth of the surgical emergencies that it is the most common cause of adhesions caused by previous abdominal surgeries. Patients without a history of abdominal surgery should consider other causes. One of the causes of small bowel obstruction is Meckel diverticulum.¹ So that about 40% of Meckel diverticulums have signs of small bowel obstruction.² Meckel diverticulum is the most common congenital malformation of the digestive tracts.³ Which is due to the presence of the proximal portion of the Vitelline duct or

omphalomesenteric in the 5-7 fetal weeks⁴ and usually found on the antimesenteric border of the ileum.⁵ The prevalence of this disorder is between 1% and 4% of the population⁶ and is more likely to occur in men two-times more than women.⁷ The most common manifestations of Meckel diverticulum are bleeding, small bowel obstruction and diverticulitis.⁸ small bowel obstruction is the second most common complaint in the Meckel diverticulum patients.⁹ Which can be due to Intussusception and small bowel volvulus around a diverticular band that is anchored to

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the anterior abdominal wall (Axial torsion of the Meckel diverticulum), a little hernia, and a stuck in a bowel loop due to a mesodiverticular fibrotic band.⁶ Although small bowel obstruction due to the mesodiverticular band is not common¹⁰, we report a 28-year-old patient with small bowel obstruction due to the mesodiverticular band Which is around the intestine.

Case Report:

The patient referred to the hospital was a 28-year-old man who had abdominal pain with repeated nausea and vomiting two days earlier. The patient's pain was colic and intensified after eating and healed with vomiting. The patient vomits contained the foods he had eaten. Gas disposal and stool was noted. The pain of the patient intensified 24 hours before the lookup. The patient also noted anorexia. The patient did not mention a history of previous cardiac surgery and digestive problems, but occasionally the consumption of alcohol was mentioned. In the examination of vital signs, the patient's temperature by mouth measurement 37.6, blood pressure 110/70 mmHg, pulse 86 beats per minute and breathing rate 18 times per minute were obtained. Patient's abdomen is also slightly dilated and scar surgery and hernia were not seen. Sounds of the intestines were hyperactive. At the touch of the abdomen, tenderness of the abdomen was evident with the preference of the middle region of the abdomen. There was no rebound tenderness. In the patient, there was voluntary guarding. In the rectal examination, the non-bloody soft stool was obtained. The patient received fasting and started serum therapy for him. He was asked for blood cells count, electrolytes, blood gases, and other parameters related to the acute abdomen. The results of the patient's blood cells count showed leukocytosis with 12100 cells and neutrophil counts of 70%. The patient's hemoglobin was 14.6 g / dl and the patient was positive for CRP. The results of blood gas analysis showed that blood pH, PCO₂, PO₂, and HCO₃ were 7.42, 32, 95 and 20.8, respectively. The other parameters were Na: 143, K: 3.46, Cr: 1.1, Urea: 29. There is no free air below the diaphragm in the standing chest radiography. In the standing stomach radiography, bowl loops are dilated but there is no fluid air level. The abdominal recumbent radiography showed the intestinal loops full of air (Figure 1).

In the report of the abdomen and pelvic sonography localized Ileus was seen in the center of the abdomen. Free fluid was seen in the pre-hepatic and pre-ipellinic spaces and para-colics.



Figure 1: patient's abdominal recumbent radiography that dilated loops of small bowel are distinct

The stomach is dilated. Abdominal and pelvic CT scans have been reported the dilatation of small bowel loops with screw-on loops around the origin of the arterial and upper mesenteric vein and mesenteric root. Ischemic changes have not been made in the intestine. The transitional area is seen in the distal ileum and the colon has been overlapped so that there are several levels of mild fluid air (Figures 2 and 3).



Figure 2 and 3: CT with intravenous contrast showed dilated loops of small intestine and overlapped colon.

According to the CT scan report and the patient's clinical unimprovement, he was transferred to the surgery room for laparotomy. The abdomen was opened by midline cutting. About 50 cc of Serous fluid suctioned. The intestines were dilated but there was no ischemic change, the cecum was above the normal range of the umbilicus. About 60 cm of the terminal ileum Multiple adhesive bands that caused collapse and trapping intestine were released after releasing the Meckel diverticulum. Appendectomy was done. The terminal ileum adhesion to retroperitoneum was released. After removing a large adhesive band of about 60 cm from the ileocecal valve, broad and inflamed diverticulum was removed from the base of about 2 to 2.5 cm (Figures 4 and 5).

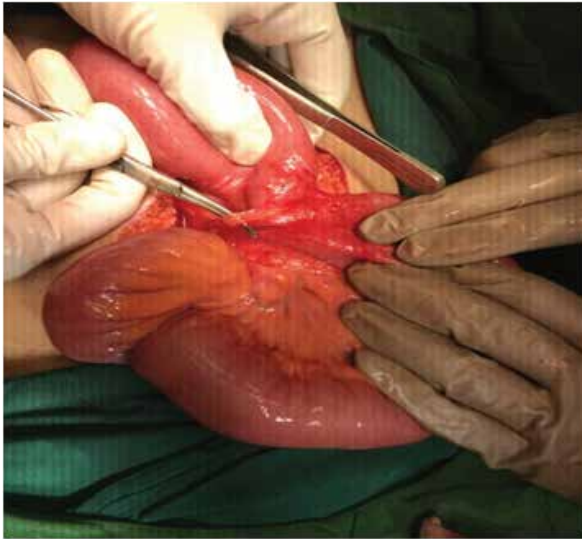
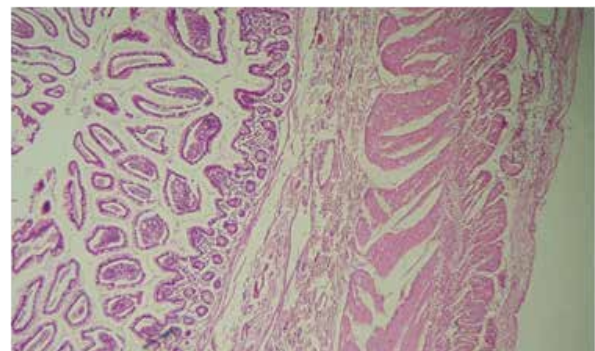
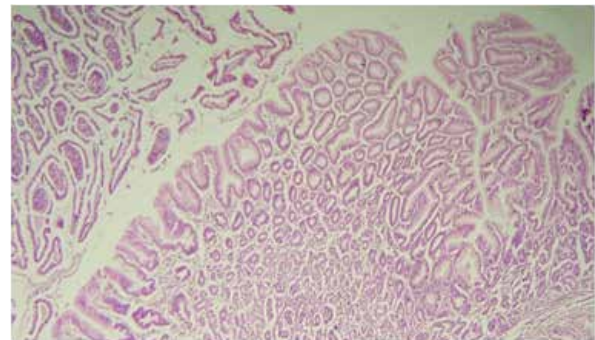


Figure 4 and 5: After removing a large adhesive band of about 60 cm, the ileocecal lid of the broad and inflamed diverticulum was removed with a base of about 2 to 2.5 centimeters. The small bowel dilated loops are visible without ischemic changes.

The fluid movements in the lumen of the intestines were checked up to the cecum, stomach, cecum, ascending colon, transverse colon, descending colon and sigmoid were normal, the sample was sent for pathologic examination. After the surgery, the patient was transferred to the department and after a few days, was released from the hospital in a good general condition.

Pathology report of patient sample was reported Meckel diverticulum with a mucosal covering of the intestine along with areas of gastric mucosa (Figures 6 and 7).



Figures 6 & 7: H & E staining represents Meckel diverticulum with all layers of normal small bowel wall with normal gastric mucosa

Discussion:

Meckel diverticulum was first described in 1598 by Fabricius Hildanus but due to the discovery of its embryonic structure in 1809, it was named by Johann Friedrich Meckel in 1809.¹¹ Most of the Meckel diverticula are asymptomatic.¹⁰ that is why less than 10% of Meckel diverticulum cases are detected before surgery.^{12,13} also, it is difficult to diagnose properly the Meckel diverticulum before surgery because it may be indistinguishable from other intra-abdominal complications, such as appendicitis, inflammatory bowel disease, or other causes of small bowel obstruction. In such a situation, if the patient doesn't have to bleed,

proper diagnosis finds special importance.¹⁴ the results of a study that were performed on 776 patients with Meckel diverticulum showed that 88% of patients who had been presented bleeding correctly diagnosed before surgery. In contrast, among those who presented with a symptom other than bleeding, only 11% of the cases were correctly diagnosed before surgery.¹⁵

Simple radiography is usually not useful in the diagnosis of Meckel diverticulum. However, small bowel obstruction is usually visible on simple abdominal radiography.¹⁶ Meckel diverticulum differentiation with CT scan is difficult in asymptomatic cases from the normal small intestine So that in a report of CT scan findings in 11 patients with Meckel diverticulum, the presence of gangrene or secondary intestinal obstruction was associated with poor diagnostic accuracy. In a CT scan, both intravenous and oral contrast agents may help the diagnosis of Meckel diverticulum and should be performed whenever necessary.¹⁷ Laparoscopy has also been reported as a diagnostic tool in the Meckel diverticulum.¹⁸

The mortality rate in symptomatic patients is about 6%, which is higher in elderly patients.¹⁸⁻²¹ Delay in the diagnosis of Meckel diverticulum with side effects can lead to patient's death.²² Care standard in Meckel diverticulum is surgery to harvest complications. The surgical procedures used include simple diverticulectomy or removing a part of the ileum where diverticulum is present. Removal of the ileum when there is evidence of

severe inflammation, perforation, or tumor is necessary.²³ In the surgery, bands attached to the abdominal wall should be removed. Cumulative incidence of early postoperative complications is 12%, including mainly surgical site infection (3%), prolonged ileus (3%) and anastomotic leak (2%) with a mortality rate of 1.5%.²

Conclusion:

In adults, symptomatic Meckel diverticulum is better diagnosed, which helps to improve surgical treatment. In young adults with small bowel obstruction, diagnosis is rarely made before surgery. Due to the rare occurrence of this complication and its variable clinical manifestations, differential diagnosis of this complication is not easy and imaging techniques may be inappropriate. To overcome these problems, a CT scan is recommended with oral and intravenous contrast agents. To diagnose correctly, especially in patients with unusual symptoms, it is necessary to have symptoms of Meckel diverticulum in mind.

Ethical Approval:

This case report was published after getting approval of the Ethics Committee of LUMS, Iran

Conflict of interest:None

Authors' Contributions:

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Submitting Manuscript: Babak Khodadadi

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