

Case Report

Meckel's Diverticulum associated with a thin fibrous band causing strangulated small bowel obstruction.

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Abstract:

We report a case of an infant, three and half month old who presented with acute abdomen. Investigations including complete blood count and X-ray abdomen were non informative apart from showing evidence of intestinal obstruction. On abdominal exploration, there was a thin fibrous band attached to the apex of Meckel's Diverticulum [MD] and the umbilicus. The band caused strangulated terminal small bowel loops resulting in bowel gangrene and obstruction which is a rare presentation. Resection of the gangrenous loops was performed and the patient made uneventful recovery. However, fear of having B₁₂ and bile salts malabsorption is a real future concern. On abdominal exploration, there was a thin fibrous band attached to the apex of the MD and the umbilicus, causing tight pressure on many loops of small bowel. A long segment of the small bowel, about 30cm, was found to be strangulated. The infarct segment includes the MD and divided into a proximal and distal segment to the MD. The proximal segment about 10cm and the distal segment about 20cm. so a large segment of the terminal ileum was excised, leaving only a segment about 10cm at the iliocaecal junction. End to end anastomosis was done by a single layer and the patient had uneventfully postoperative recovery.

Conclusion: MD is a cause of serious gastrointestinal tract complications in all age groups, from neonate to adult life. Band associated with MD may cause pressure on the terminal ileum and may lead to obstruction and strangulation of terminal ileum which important for vitamin B12 and bile salts absorption.

Keywords: iliocaecal, anastomosis, malabsorption, gangrenous.

Meckel's Diverticulum MD is a true intestinal diverticulum, contains all normal layers of the intestinal wall^{1,2}. The congenital abnormality results from failure of the vitelline duct to obliterate during the fifth week of fetal development^{1,2}. MD occurs in about two percent of the population^{1,3}. It occurs in both sexes, with slight high incidence in male^{4,5}. It causes complications more frequently in males^{1,5,6}, therefore, is more often diagnosed in males⁴. Its blood supply comes from a terminal branch of the superior mesenteric artery that crosses the ileum to the diverticulum^{1,4,7,8}.

MD is usually lined by small bowel mucosa but sometime it contains ectopic tissue from the different parts of the gastrointestinal and genital tract.

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The ectopic tissue is found in approximately 50% of cases². Gastric and pancreatic tissue predominate^{1,6,7}. The highly acidic secretions of gastric tissue may cause ulcerations that often lead to early diagnosis because of symptoms of gastrointestinal bleeding⁴. The alkaline secretions of ectopic pancreatic tissue can also cause ulcerations⁹.

The majority of patients are asymptomatic and discovered incidentally⁵. Appendicitis is the most common preoperative diagnosis in cases of complicated Meckel's diverticulum⁴. Lower gastrointestinal bleeding due to ulceration caused by presence of ectopic gastric and pancreatic tissue in the diverticulum is common and lead to early diagnosis². The common complication of symptomatic patients was intestinal obstruction⁵.

The diagnosis of symptomatic MD is difficult

to make, especially in adults^{4,10,11}. The diagnosis must be considered in anyone with unexplained abdominal complaints nausea and vomiting, or intestinal bleeding^{12,13}.

A person with MD has a four to six percent lifetime risk of developing a complication⁶. The major complications are hemorrhage, obstruction, intussusception, diverticulitis and perforation^{1,6,8,10}. Lower gastrointestinal tract bleeding is the most common complication occurring in children, and it typically presents as hematochezia². The common complications in adult are intestinal obstruction and diverticulitis or both^{3,9-11}.

Case report:

An infant, three and half month old, had two days of febrile illness with dry cough. After that he developed abdominal distention, vomiting and constipation. The neonate had normal delivery and normal developmental history. On examination he is ill, temperature 37.8 degree c., pulse rate 108/ min and respiratory rate 56/ min. He is not pale or jaundiced. Chest and cardiovascular systems are normal. Abdomen is mildly distended, on palpation there is generalized abdominal tenderness and muscle rigidity. Per rectal examination showed empty rectum. Investigation of the patient showed Hb. 10.2 g/dl, TWBC 10.500 cells/cmm, and blood film for malaria negative. Urine examination showed few pus cells per high power field. Plain abdominal X-ray, supine and erect, showed distended small bowel loops and multiple fluid levels [x-ray (B)].



X-ray (B) show multiple fluid levels

A diagnosis of acute abdomen was established and the patient was prepared for abdominal exploration. The abdomen was opened through upper transverse incision. There were strangulated loops of small bowel. The cause of strangulation was a thin fibrous band attached to the apex of the MD and the umbilicus, causing tight pressure on many loops of small bowel [photo 1, 2].

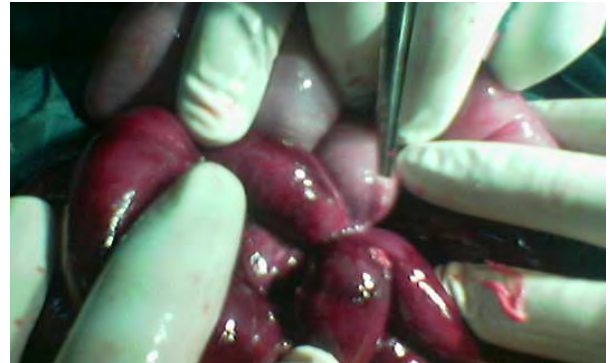


Photo [1]: show the tight band strangulated the small bowel.



Photo [2]: a thin band attached to the apex of the MD

A long segment of the small bowel, about 30cm, was found to be gangrenous. The gangrenous segment includes the MD and divided into a proximal and distal segment to the MD. The proximal segment about 10cm and the distal segment about 20cm. so a large segment of the terminal ileum was excised, leaving only a segment about 10cm at the iliocecal junction. Single layer of end to end anastomosis was done and the patient had uneventfully postoperative recovery.

Discussion:

Although MD causes intestinal obstruction in different age groups, the mechanism of obstruction differ from patient to patient. Eighteen cases of intestinal obstructions caused by a band in relation to MD were reported. The ages of the patient ranged from 3days to 11years¹⁴. In neonate MD caused ileal volvulus by inflammation and adhesion¹⁵, or kinking of the proximal and distal ileum at the level of MD¹⁶. Other study showed MD as a significant cause of intestinal obstruction in pre-school children¹⁷. Perforation of MD in neonates was reported^{18,19}.

Our patient presented as strangulated small bowel obstruction. The cause of obstruction was a thin fibrous band attached to the apex of a well developed MD and the other end to the umbilicus. On clinical examination MD was not expected, but it cause serious complications. The important point in complications of MD is that it affects the terminal ileum. In our patient we resected about 30cm of the small bowel and with difficulty we preserved about 10cm of terminal ileum at the ileocaecal junction. The resected segment includes the MD, a proximal segment to MD of about 10cm and a distal segment to MD of about 20cm. With large segment resected from terminal ileum the absorption of vitamin B12 and bile salt may be affected.

MD occur in 2% of the population. It is the commonest congenital abnormality of the gastrointestinal tract and is difficult to diagnose². All used investigations are of limited help in the diagnosis of MD. Plain abdominal radiographs are useless and arteriography is not always diagnostic⁴. Contrast study and follow-through of the upper gastrointestinal tract are of limited value¹. MD can be diagnosed by Technetium-99m pertechnetate scanning, but this depends on presence of ectopic gastric mucosa in MD which take the isotope^{4,6, 7, 20}. Computed tomographic scan of the abdomen is not specific, but it may be helpful in the diagnosis of MD^{21,22}. Some studies showed that laparoscopy is effective in diagnosis of MD

when other modalities of investigations failed. The same studies confirmed that laparoscopy is a safe and cost-effective in management of MD²³⁻²⁶, this means that laparoscopy in the future may play a major role in the diagnosis and management of emergency symptomatic patients. To avoid serious complications, asymptomatic individuals should have consideration. The difficulty is how to pick up these asymptomatic individuals. Some studies suggest familial inheritance but no evidence of genetic risk factor for MD²⁷. Also MD may be associated with cleft palate, bicornate uterus, annular pancreas and Crohn's disease²⁸. More studies are needed to put some criteria which may be a guide for laparoscopic examination for individuals who may be more suspected to have MD.

The serious complication and the early age of presentation are of interest in this patient. Although the life of the infant was saved, but we afraid he may develop some abnormalities in absorption of vitamine B12 and bile salts due to resection of large segment of the terminal ileum. It is expected that in the future we will be able to discover this abnormality very early. Also MD should remember when a similar abdominal problem is faced.

Conclusion:

MD is a cause of serious gastrointestinal tract complications in all age groups, from neonate to adult life. Band associated with MD may cause pressure on the terminal ileum and may lead to obstruction and strangulation of terminal ileum which is important for vitamin B12 and bile salts absorption. Abdominal exploration, if laparoscopy is not available, should not be delayed for a patient suspicious for MD.

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