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Case Report

Surgery Section

Tuberculous Perforation of Meckel's Diverticulum

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ABSTRACT

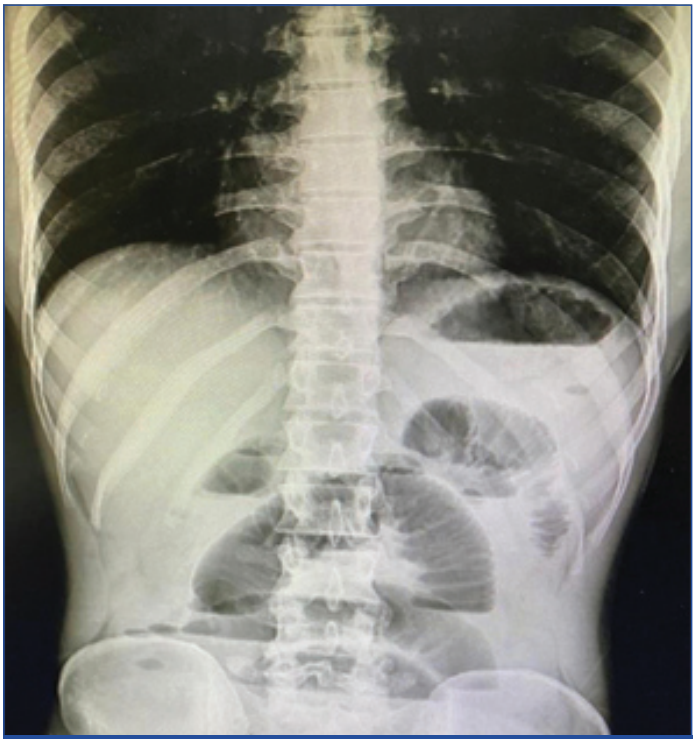
Meckel's Diverticulum (MD) is an example of a true diverticulum, consisting of all the three layers of small intestine. It is a remnant of omphalomesenteric (vitellointestinal) duct found on the antimesenteric side of the ileum. Perforation of MD is an uncommon complication of an effectively uncommon abnormality, which regularly mimics an appendicular perforation clinically. Although intestinal tuberculosis is a major issue in many parts of the world, a handful of cases of tubercular perforation of MD have been reported in the literature till date. This case of tubercular perforation of MD was reported due to the rarity of the condition and presence of fairly less literature on the topic. A 30-year-old male patient presented with abdominal pain, fever, vomiting. On examination, tachycardia, guarding, rigidity and rebound tenderness were observed. Exploratory laparotomy revealed perforation of MD with inflammation of ileum and caecum with dense adhesions. Proximal loop ileostomy was made. Histopathology showed features of tuberculosis. Postoperative recovery was uneventful and patient was started on antitubercular treatment and 4 kgs weight gain on follow-up after one month.

Keywords: Ileum, Intestinal tuberculosis, Perforation peritonitis

CASE REPORT

A 30-year-old male presented to the emergency with complaints of acute abdominal pain, abdominal distension, fever, and multiple episodes of vomiting for four days and absolute constipation for one day. The abdominal pain was sudden in onset, initially started in right lower abdominal region for two days and later became generalised. He had no other illnesses/co-morbidities, no prior history of tuberculosis. No history of any drug intake. On examination, patient was febrile, tachycardia with tense, distended, rigid, silent abdomen with guarding, rigidity, rebound tenderness present, no bowel sounds heard. Rectal examination showed marked tenderness. Fluid resuscitation was started, urinary catheterisation, gastrointestinal decompression by nasogastric tube insertion, analgesics and antibiotics were started. X-ray erect abdomen and Ultrasound (USG). Abdomen and blood investigations were done. X-ray erect abdomen showed multiple air fluid levels [Table/Fig-1]. USG abdomen showed signs of small bowel obstruction with peritonitis (thick-walled small gut loops, mesenteric lymphadenopathy, tubercular). Laboratory investigations revealed included total leukocyte count was 17.08×1000 cumm, haemoglobin was 13.9 gm%, erythrocyte sedimentation rate was 45 mm/h, lactate dehydrogenase was 2832 IU/L. In peritoneal fluid analysis, adenosine deaminase was 44 U/L (body fluid positive >23 U/L), glucose 31 mg/dL and protein was 2.6 gm/dL.

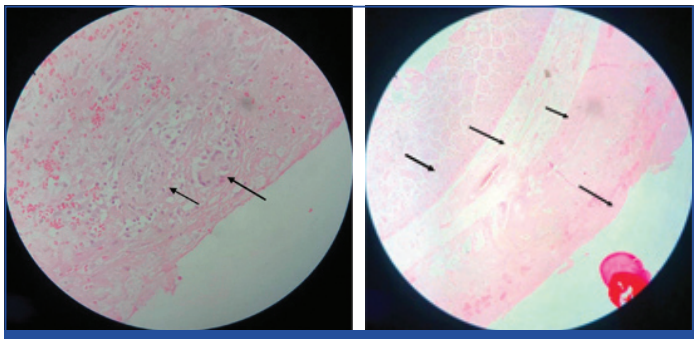
Patient was taken up for emergency exploratory laparotomy. About four feet of terminal ileum was thick and inflamed and dense adhesions were present between bowel loops, findings highly suggestive of abdominal tuberculosis (TB). Differential diagnosis considered was enteric fever and crohn's disease disease. Widal test for IgG and IgM were negative. Adhesiolysis was done after which omentum was found to be adhered to MD two feet from ileocecal junction, measuring 5×3 cm. Perforation was noted at the tip of MD [Table/Fig-2]. Resection of segment of ileum containing MD was done with proximal end ileostomy as severe inflammation was present. The resected part of ileum containing the diverticulum was sent for biopsy [Table/Fig-3]. Mesenteric lymphadenopathy was noted and biopsy was taken. The biopsy of the specimen revealed MD and the perforated area showed focal ulceration of the mucosa. There was presence of multiple epithelioid cell granuloma with histiocytes and



[Table/Fig-1]: X-ray erect abdomen showing multiple air fluid levels

Langerhans giant cells, suggestive of tuberculosis (TB) [Table/Fig-4,5]. There was transmural lymphomononuclear infiltrate with eosinophils, neutrophils and plasma cells. Section of lymph node section showed reactive lymphadenitis. Impression ileum segmental resection was consistent with MD having perforation. TB and chest medicine opinion was sought and the patient was started on antitubercular drugs based on Directly Observed Treatment (DOTS) regimen. Intensive phase for two months was to be followed by continuation phase for four months. Adult drug dosage for tuberculosis was calculated on weight of the patient three tablets of isoniazid 75 mg, rifampin 150 mg, pyrazinamide 400 mg, ethambutol 275 mg were started. The patient was discharged in stable haemodynamic condition after 12 days. Patient showed weight gain of 4 kg during follow-up after one month.

[Table/Fig-2]: Intraoperative image showing Meckel's Diverticulum 2 feet from ileocecal junction, on anti-mesentric border measuring 5×3 cm. Perforation was noted at the tip of Meckel's Diverticulum, terminal ileum was thick and inflamed.
[Table/Fig-3]: Gross appearance of the resected Meckels's diverticulum. (Images from left to right)



[Table/Fig-4]: Histopathology microscopic image (H&E stain, 40X view) showing presence of multiple epitheloid cell granuloma with histiocytes and giant cells.
[Table/Fig-5]: Histopathology microscopic image (H&E stain, 10X view) showing all layers of the wall of Meckel's Diverticulum-mucosa (arrow on the left), submucosa, muscularis propria, serosal layers (arrow on the right). (Images from left to right)

DISCUSSION

The MD results from incomplete regression of the omphalomesenteric duct (vitelline duct) found on the antimesenteric side of the ileum [1]. MD follows the popular rule of two which states that it is present in only 2% of the population, 2 inches long and located 2 feet away from the ileocecal valve consisting of about 2/3rd ectopic mucosa and derives its blood supply from the vitelline artery branch of superior mesenteric artery [1]. MD is the most common congenital malformation of the gastrointestinal tract incidence ranging between 0.6 to 4% [2]. The prevalence of asymptomatic MD between males and females no differences were seen, in children symptomatic MD has a male-to-female ratio of 2 to 5:1 [3]. The most widely recognised clinical presentations are: lower gastro-intestinal bleeding due to ulceration created by heterotopic gastric mucosa; internal volvulus or intussusception causing intestinal obstruction; localised inflammation with or without perforation clinically mimicking acute appendicitis [4]. Clinical and laboratory diagnosis of a MD complication is very challenging [4]. Commonly found incidentally during surgeries. Meckel diverticulum can be related with life threatening disease states [5].

The lifetime danger of building up an complication that requires a surgical procedure was assessed to be 6.4% in a large population study of 42 years period by Cullen JJ et al., [6]. The major complications are haemorrhage, obstruction, intussusception, diverticulitis and perforation. In children, bleeding is the common complication due to heterotopic gastric mucosal ulceration. Obstruction, diverticulitis is common in adults [7]. Complications of MD are seen in the paediatric population, incidence of complications reduces with age [8]. Few cases of tuberculosis of Meckels diverticulum were reported of which male predominance was noticed in many of these cases in the age group between 20 to 45-years-old [9-12]. The clinical findings frequently will imitate other diseases and can be very hard to distinguish.

Commonly considered as differential diagnosis in intestinal obstruction and intestinal haemorrhage [1]. Examination revealed tense, distended abdomen with no bowel sounds similar to this case [10,13,11], whereas localised tenderness and guarding in right iliac fossa noticed in one case [12]. Few authors had described X-ray findings as free gas under diaphragm [10,13] and multiple air fluid levels [11] as seen in this case. MD obstruction leads to distal inflammation, necrosis or an perforation ultimately results in formation of an abscess or peritonitis [2]. Our extensive literature has revealed only few cases of tuberculosis of MD [9-12]. Involvement of meckels diverticulum by tuberculosis leading to perforation is very rare. Diagnosis and management of a complicated MD is done by means of an exploratory laparotomy which was done in most of the cases [9-13], which by far is the gold standard particularly in unstable patients [14].

Comparing the operative findings, perforation was noted at the tip of the meckels diverticulum similar to this case [10], whereas synchronous perforation of meckels diverticulum and ileum [13] and intestinal obstruction due to stricture at the base of meckel diverticulum [12]. Comparing the various surgical procedures done were of resection of the ileum that includes the diverticulum [11,12], primary repair of the perforation at the tip of the meckels diverticulum [10], limited right hemicolectomy with resection of 2 feet ileum [13], resection of the ileum that includes the diverticulum and stoma formation was done in this case. Ileal resection is done, if the diverticular base and the adjacent ileum are indurated [10]. Surgical indication for resection is complications such as haemorrhage, intestinal obstruction, diverticulitis [10]. If appendicitis was suspected and when the appendix appears normal during surgery, it is important to access the ileum for an inflamed or perforated MD, commonly MD is an intraoperative finding [13]. Histpathological diagnosis revealed as tuberculosis [9-12]. Excision is the preferred management of choice followed by antitubercular treatment [11].

CONCLUSION(S)

The incidence of intestinal tuberculosis in uncommon sites should be carefully looked for especially in countries where tuberculosis is endemically prevalent. This case demonstrates that it was very important to suspect a complicated MD when diagnosis of appendicitis was in question. This case report was an intriguing and a rare case of MD and its complications. It is important to look for MD; by examining the small intestine, especially if free fluid or pus is found. Thus, emphasising on the importance of considering MD as one of the possible diagnosis in a patient presenting with acute abdomen.

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