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Small bowel volvulus with large mesenteric defect in paediatric patient: An unusual presentation of acute abdomen

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Abstract
Introduction: In children, internal herniation with small bowel strangulation due to the cause of a mesenteric defect is a rare cause of intestinal obstruction. So early diagnosis and early treatment in the paediatric emergency department are important factor for this disease.
Aim: This case report, aim is to study the small bowel volvulus with large mesenteric defect in paediatrics patient, which is very rare.
Method and materials: A male child of 2 year and 8-month-old came to the emergency department of our institute with complains of abdominal pain, vomiting (bilious) and not passing stool for 2 days. On radiographic findings shows that, internal herniation is gaseous distension of the bowel loops in the upper abdominal area with a paucity of gas in the lower abdomen. Primarily patient vitally stabilized and plan for emergency operation. Exploratory laparotomy done and large mesenteric defect closed. Gangrenous segment resected and end ileostomy done with distal mucous fistula formation. Patient discharged successfully on 6th pod.
Conclusion: Early diagnosis and treatment is very important in these patients. The most important step for this disease is early diagnosis of acute intestinal obstruction sign and symptoms like- tenderness, guarding and rigidity also vomiting and painful abdomen. So, it is very important that, Internal herniation should be considered in differential diagnoses of acute abdomen in the Paediatric Emergency Department.

Keywords: Exploratory laparotomy, internal herniation, distal mucous fistula

Introduction
In children, an internal herniation with small bowel strangulation due to a mesenteric defect is a very rare cause of intestinal obstruction. The cause of acute intestinal obstruction due to the internal hernia only found in 0.9-1.78% [1] and mesenteric hernia only found in a series of autopsies reported by Shaffner and Tennel was 0.2-0.9% [2]. In adult para-duodenal hernia due to postoperative defect is most common but in children, trans mesenteric hernias are thought to arise from a congenital defect in the small bowel mesentery near the ileocecal region or ligament of Treitz, is most common cause [1, 3]. The incidences of volvulus or strangulation due to trans-mesenteric herniation are as high as 30-40% [4, 5], with mortality rates of 50% for treated cases and 100% for nontreated cases [4, 5]. Early diagnosis and prompt treatment in the paediatric emergency department are important.

Case Report
A male child of 2 year and 8-month-old came to the emergency department of our institute with complains of abdominal pain, vomiting (bilious) and not passing stool since 2 days. On examination abdomen was distended with tenderness present in right lumbar, right iliac, umbilical and left lumbar region. The child was admitted and emergency treatment started with intravenous fluids and antibiotics. A nasogastric tube of 10F inserted and connected to a urobag, it has bilious output of approximately 150ml. X-ray abdomen was done and showed multiple air fluid levels [Fig. 1] and an abdominal ultrasonography suggestive of features of intestinal obstruction. Patient blood work up was Hb 12.0 gms/dl, TLC 11700/cumm, platelets count 118000/cumm, serum sodium 141 mEq/L, Pottasium 3.8 mEq/L, chloride 108mEq/L, Urea 19 mg/dl, creatinine 0.26 mg/dl, viral markers- negative.

The patient was planned for laparotomy, on exploration there was a large mesentric defect present from mid to terminal ileum and a segment of distal ileum volvulus of length approximately 25cm around distal end of mesenteric defect with gangrenous changes 20 cm proximal to ileocaecal junction [Fig. 2]. Resection of gangrenous ileum was done and end ileostomy with distal mucous fistula done. In post-operative period child recovered very well. Stoma started functioning on post-operative day (POD) 2, nasogastric tube removed and allowed orally. Child was discharged in stable condition on POD6.

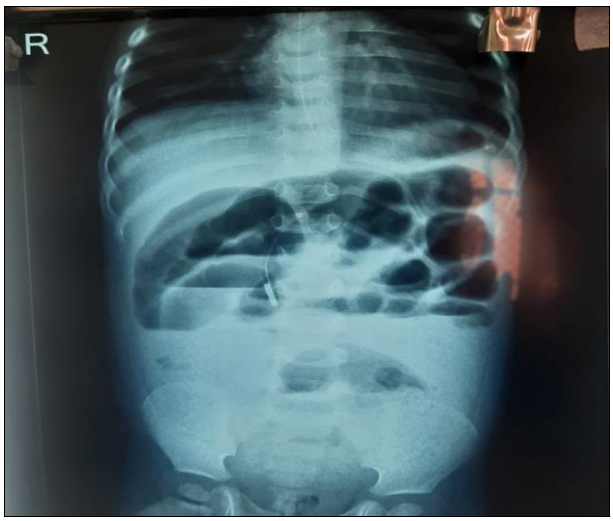

Fig 1: X-ray Abdomen erect [multiple air fluid level suggestive of intestinal obstruction]

Fig 2: Intraoperative picture [large mesenteric defect with distal ileum volvulus with gangrenous changes]

Discussion

The exact pathogenesis of the Mesenteric defect formation is still uncertain. Many hypotheses were proposed such as [6, 7]

- Dorsal mesentery regression.
- Hypo-vascular area enlargement in developmental stage.
- Rapid lengthening of a segment of mesentery
- Compression of the mesentery by the colon during fetal mid-gut herniation into the yolk sac

On clinical examination, intermittent obstructive symptoms like abdominal pain, abdominal distension, nausea, vomiting and constipation seen, because in this pathology bowel loops, pass in and out through the defect [8]. The most common presenting symptom in children, is sudden onset of abdominal pain which is located in peri-umbilical area and epigastric region of abdomen. But in the neonates, persistent vomiting and abdominal distention are generally present, and most of these patients remain relatively asymptomatic until they are started on enteral feeds.

A retrospective data suggestive that, a small-bowel dilatation with a transition point, clustering of small-bowel loops, and mesenteric vessel abnormalities found in this disease. If twisting of mesenteric vessels found then “closed loop” sign found and if volvulus found a whirl sign found [9]. Plain abdominal X-ray findings are essentially those of intestinal obstruction, such as consistent intestinal gas after an interval of several hours, suggesting the possibility of an internal hernia [10]. In the upper abdominal area, Gaseous distension of the bowel loops with a paucity of gas in the lower abdomen should some indication of the paediatric surgeon to the possibility of an internal hernia. But definite diagnosis of this disease is only made by intraoperatively findings.

Surgical treatment is based on the operative findings. If the gangrenous bowel found, then resection with an end-to-end anastomosis or stoma formation done, to restore bowel continuity. Mesenteric defect, should be closed with non-absorbable sutures, regardless of its size of defect.

Conclusion

The most important step for the paediatric surgeon is early recognition of the acute abdominal signs, including muscle guarding and rebounding pain, vomiting, and unexplained persistent or intermittent abdominal pain. Radiographic findings suggestive of internal herniation are gaseous distension of the bowel loops in the upper abdominal area with a paucity of gas in the lower abdomen. Internal herniation should be considered in differential diagnoses of acute abdomen in the Paediatric Emergency Department.

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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