

## Idiopathic Perforation of the Sigmoid Colon in a 2.5 Years Old Girl: A Case Report

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### Abstract

Idiopathic colon perforation is rare in children. It is more common at the extremes of age. Splenic flexures, ileocecal and lower sigmoid regions are the most common sites of perforation. Delay in proper management of this condition is associated with high mortality and morbidity rate.

We report on the case of a 2.5 years old girl who presented with fever, diarrhea, nausea and vomiting and progressive abdominal distention. Finally, she underwent an exploratory laparotomy for suspected peritonitis because of the patient's worsening condition. An area of perforation was found in the sigmoid colon that segmental resection and an end double barrel colostomy was done.

**Key Words:** Child, Colon Perforation, Idiopathic.

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## 1- INTRODUCTION

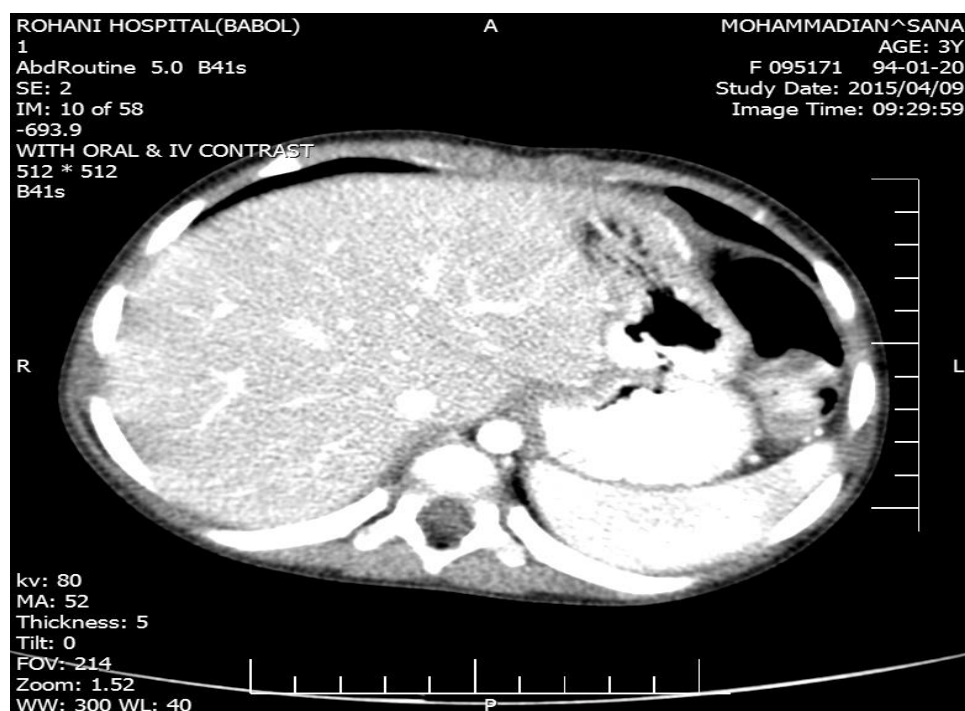
Colon perforation is an abdominal surgical emergency in the pediatric population (1). The perforation may be caused by various conditions, including necrotizing enterocolitis (NE), Hirschsprung disease (HD), mechanical obstruction, meconium plug syndrome, small left colon syndrome, or idiopathic perforation (2, 3). Idiopathic colon perforation without any clear etiology is rare in children (4). It is more common at the extremes of age, especially in the elderly and premature infants (5). Delay in diagnosing or treating idiopathic colon perforation is associated with high mortality and morbidity rates (6). We present a case of colon perforation without clear etiology that included fever, diarrhea, and abdominal distention before admission.

## 2- CASE REPORT

A 2.5 years old girl presented with agitation and disorientation. She had a fever, watery diarrhea, nausea, and vomiting for about two days before admission. Her parents had given her some drops of metoclopramide. At the time of admission, her vital signs were as follows: PR, 120/min; BP, 90/60 mmHg; RR, 30/min; and T, 37.8 C<sup>0</sup>. At examination, there were no major findings in the head, neck, chest or extremities, but the patient's abdomen was distended. No signs of scar or trauma were seen. Percussion of the abdomen was somewhat tympanic. Palpation of the abdomen was unreliable because of the patient's agitation. Digital rectal examination found some fecal material in the rectum. The patient was moderately dehydrated. After a primary survey and fluid resuscitation, she was transferred to the pediatric intensive care unit (PICU) because of her confounding condition. At the time of admission, the patient's lab data was as follows: WBC, 8300/mm<sup>3</sup>; HGB, 8.7 mg/dl; BUN, 22

mg/dl; Cr, 0.7 mg/dl; Na, 127 meq/l; and K, 6.1 meq/l. The patient was rehydrated and her electrolyte impairment corrected. Her abdominal distention was progressive and became somewhat tense on palpation during the next few days, so imaging studies were conducted. Abdominal X-rays showed some dilated loops of the bowel and colon that were filled with air. Ultrasonography of the abdomen revealed interloop free fluid and a dilated, non-compressible, blind-ended loop in the right lower quadrant of the abdomen, suggestive of appendicitis. An abdominopelvic CT scan showed free air and fluid in the abdominal cavity and bowel dilatation with normal appendix vermiformis (AV), which was suggestive of hollow viscus perforation (**Figure.1**).

A paracentesis to assess cell count in the abdominal fluid found many white blood cells that were more than 90% polymorphonuclear. On the fifth day of admission, because of the patient's progressively worsening general condition, physical examination, and imaging findings, she underwent an exploratory laparotomy for suspected peritonitis. Exploration found pus and reactive serous fluid in the peritoneal cavity, which was irrigated and suctioned. The small bowel and colon were generally distended. An area of perforation was found in the sigmoid colon at the antimesenteric wall. There was no gross fecal material in the abdominal cavity. The sigmoid colon underwent segmental resection, and an end double-barrel colostomy was placed. The histopathology report showed no major disease in the resected colon and no evidence of malignancy or ischemia. After surgery, the patient had an uneventful period in the PICU. Eventually, she was discharged home in good condition and followed up in the outpatient clinic. Her colostomy was repaired and closed three months after the first surgery, without complications.



**Fig.1:** Abdominal CT scan showed free air in abdominal cavity.

### 3- DISCUSSION

Colon perforation is an emergent condition that causes peritonitis, which has high mortality and morbidity rates if diagnosis or treatment, are delayed (1, 6). Idiopathic colon perforation is rare in children (4), being more commonly found in the very old or the very young, especially premature infants (5, 7). Idiopathic bowel perforation was first described by Breslau in 1863 as a perforation in which no NE or other cause could be found. Usually, it occurs in low or very low birth weight infants in whom traumatic delivery, congenital defects of the bowel with diverticulum formation, localized vascular insufficiency, and intrauterine or postpartum infection have occurred (8). However, our patient had not had a premature birth and had no major medical history. Many conditions can cause bowel perforation, including NE,

HD, mechanical obstruction, and some infections or idiopathic (2, 9, 10). A study by Chang et al. found that non-traumatic colon perforation most commonly occurred in children under the age of 5 years, with patients' mean age being  $2.22 \pm 1.87$  years, and 91.4% of them being under age 5 (1). According to that study, the perforation may be secondary to infection, especially with non-typhoid salmonella (1). Our patient's case bore similarities to those findings, as the patient was a 2.5 years old girl with signs and symptoms, including nausea, vomiting, fever, and watery diarrhea, of a gastrointestinal tract infection. In line with young patients usually being premature infants, another study found that the mean age at presentation was  $8.33 \pm 0.11$  days (range: 2–110 days) (2). That study reviewed common causes of colon perforation. Another study found out that spontaneous colon perforation in young

children was a manifestation of Ehlers-Danlos syndrome (11). As mentioned previously, there is no clear cause for idiopathic colon perforation, but some studies, including the one by Chang et al., have found that non-typhoid salmonella was the leading pathogen isolated and was responsible for 20.4% of the episodes (1). In addition, according to the Chang study and another one, the most common sites of perforation were the ascending and transverse colon (1, 2). In our patient's case, the perforation occurred in the sigmoid colon, which is rare in children. However, such an event can be explained by weak vasculature in the sigmoid colon. Chen et al. documented cases of young children in which the splenic flexure and the ileocecal and lower sigmoid regions were the sites of perforation because of their weak vasculature (12).

In the Chang et al. study, the most common symptom was fever (97.7%), which our patient had before admission, and the most common sign was abdominal distention (93.1%) (1), which our patient also had. That study also found that the mean duration of symptoms prior to admission was 6.19 days (1). In our case, it was about 3 days. In addition, Chang stated that a plain abdominal radiograph can be an adjunct diagnostic tool and had been used to find pneumoperitoneum in 86.3% of patients (1). In our case, abdominal radiography showed bowel dilatation but no pneumoperitoneum. Furthermore, Chang stated that an abdominopelvic CT scan can be helpful for diagnosing colon perforation, as it shows both pneumoperitoneum and free fluid in the abdominal cavity (1). In our case, the CT report was helpful for this purpose.

Another author has suggested abdominal paracentesis as a valuable diagnostic tool (13), and we used it to confirm infection in our patient's peritoneal cavity by finding 3. St-Vil D, LeBouthillier G, Luks FI, Bensoussan AL, Blanchard H, Youssef S.

the many white blood cells in the abdomen. The principle of managing idiopathic colon perforation is prompt surgical intervention to resect the affected segment and control the source of infection (1, 2). We followed this procedure by resecting the affected sigmoid loop and placing a colostomy.

#### 4- CONCLUSION

It is important that all pediatric healthcare providers be aware of idiopathic colon perforation in children, a rare and dangerous condition with high mortality and morbidity in cases of delayed diagnosis or management. Pediatricians should consider colon perforation as a cause in children who present with abdominal distention and a history of diarrhea for more than five days.

#### 5- ABBREVIATION

- PR: Pulse Rate.
- BP: Blood Pressure.
- RR: Respiratory Rate.
- T: Temperature.
- WBC: White Blood Cell.
- HGB: Hemoglobin.
- BUN: Blood Urea Nitrogen.
- Na: Natrium (Sodium).
- K: Kalium (Potassium).
- NE: Necrotizing Enterocolitis.
- HD: Hirschsprung Disease.

#### 6- CONFLICT OF INTEREST: None.

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