COLONIC PERFORATION IN A NURSING INFANT AS THE INITIAL PRESENTATION OF HIRSCHSPRUNG’S DISEASE. IS THERE A RELATION WITH PROKINETICS USE?

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Abstract

Perforation is a rare initial presentation in Hirschsprung’s disease. Early diagnosis and treatment are a challenge for the surgeon. A possible relation with the use of prokinetics should be studied. We present the case of a female infant, 50 days old, with constipation from birth treated with Cisapride and Trimebutine that subsequently developed irritability, bloating and vomiting. Plain abdominal X-ray revealed intra-abdominal free air and dilated bowel loops. She underwent exploratory laparotomy finding generalized purulent peritonitis, with small abscess in pelvic cavity and punctiform single sigmoid perforation. Partial colectomy and colostomy was performed. Prokinetics could contribute to the development of perforation in Hirschsprung’s disease, further work is required to examine whether the risk of perforation is increased in patients with Hirschsprung’s disease who are treated with prokinetics.

Keywords: bowel perforation, Hirschsprung’s disease, prokinetics

Background

Gastrointestinal perforation during the neonatal period is a challenge for pediatric surgeons, commonly attributed to many causes, mainly necrotizing enterocolitis [1]. Hirschsprung’s disease (HD) is caused by the absence of ganglion cells in distal bowel, extending proximally for varying distances, which can be a cause of intestinal obstruction, as well as perforation associated with obstruction in neonatal period [2]. Perforation not associated with necrotizing enterocolitis is a rare initial presentation in HD [2, 3]. Literature review indicates the rarity of bowel perforation in HD and the treatment difficulty but there are no reported cases that suggest an association with the use of prokinetics.

Case Presentation

We present the case of a female patient, nursing infant, delivered by cesarean section due to cephalopelvic disproportion with 3,300 kg birth weight, breast-fed and presented with constipation from birth. At 50 days old, she is evaluated by a physician who prescribed Trimebutine and Cisapride for constipation. Four days later the patient presents irritability, bloating and vomiting, without enteral signs. The patient has basal hypoventilation, a distended and tender abdomen, hypoaotic bowel sounds, with signs of peritoneal irritation, digital rectal exploration shown straight narrow without fecal impaction, with sensation of entering into a tight finger glove. Laboratory tests reported: hemoglobin 10 g/ml, leukocytes 5,150/mm3, neutrophils 60%, bands 4%, platelets 250,000/mm3, chlorine 102,56 mmol/L, sodium 139,5 mmol/L and potassium 3,59 mmol/L. Plain abdominal X-ray revealed intra-abdominal free air and dilated bowel loops (Fig. 1A
and 1 B). Based on clinical, radiographic and laboratory findings we decided to perform an exploratory laparotomy finding generalized purulent peritonitis with abundant fibrinous exudates on bowel loops in both paracolic sliders, with small abscess in the pelvic cavity and punctiform single sigmoid perforation (Fig. 2A and 2 B). A sigmoidectomy with terminal colostomy in barrel shotgun was performed. The postoperative period was uneventful. The patient started passing gas through colostomy at day 3, started being breast fed which was adequately tolerated, and was discharged at 5 days with good outcome. Histopathological study reported hypoganglionosis and colonic perforation with acute peritonitis (Fig. 3A and 3B). The patient was well during the 2-months follow-up and she is waiting for a definitive operation.

**Discussions**

Prenatal diagnosis of HD has not been possible. Clinical symptoms are variable and make very difficult to diagnose HD in the neonatal period and that is why an early diagnosis may not be always possible. In case of emergency surgery, seromuscular biopsies performed intraoperatively must be carried out to make the definitive diagnosis [4]. Perforation is a rare complication of HD and occurs in 3.2-4% of patients [1, 2]. Perforation is most common in the proximal colon (ileo-cecal area) in 68% of cases but can also occur in the appendix in 18% [2, 5] or terminal ileum [6, 7].

**Figure 1A and 1B** - Plain abdominal X-ray revealed intra-abdominal free air and dilated bowel loops

**Figure 2A and 2B** - Abundant fibrinous exudates on bowel loops with generalized purulent peritonitis (A) and punctiform single sigmoid perforation (B)
versal colon. It can occur in both aganglionic and ganglionic portions [8].

The most common presenting symptoms are poor oral feeding, progressive abdominal distension with bilious vomiting, tachypnea, failure or delayed passage of meconium or bleeding per rectum [6, 7].

Delayed diagnosis of HD in newborn infants not only increases serious morbidities in the neonatal period, but also indirectly affects their long term outcome.

Clinicians need to be vigilant in the recognition of HD in newborns and infants, and provide appropriate care accordingly, to prevent the detrimental complications [9]. Success rate is based on making an early diagnosis and collaboration with well-equipped neonatal intensive care units. In our country, we have failed to make an early diagnosis, most patients with constipation are treated symptomatically without knowing the cause, which causes incorrect and delayed treatment of HD [10]. Pathogenesis of perforation is still unknown and most studies have proposed that inflammation may play a major role in its development. As the disease progresses, the lumen of the intestine become filled with fibrinous exudates and this causes increased risk for perforation [2].

Other authors suggest that the lack of features of necrotizing enterocolitis in colonic perforations due to HD support the fact that perforation occurs due to increased intraluminal pressure from distal obstruction rather than inflammatory process [5, 8].

In our case, the patient was apparently in good condition until she started to be treated with prokinetics, what we believe could be a factor predisposing to perforation.

One of the causes of perforation in patients with anorectal malformation is that the downstream obstruction leads to increased intraluminal pressure, and this, along with the muscular deficiency is probably responsible for more frequent rupture of the rectum [11].

In patients with diverticular disease of the colon is well known that conditions that predispose to an increased intraluminal pressure or reduced resistance of the diverticular mucosa can lead to perforation [12]. In this view, excessive colonic segmentation may increase intracolonic pressures and the stress forces acting on the diverticular mucosa [13].

The functional obstruction caused by HD and colonic segmentation by the action of prokinetics could increase intracolonic pressure, in fact prokinetics are contraindicated in cases of obstruction [14].

Colonic perforation associated to neostigmine administration has been documented [15, 16]. Further work is required to examine whether the risk of perforation is increased in patients with HD who are treated with prokinetics.

Treatment of the perforation depends on the clinical condition of the patient following fluid resuscitation and the initiation of broad spectrum antibiotics and generally requires a stoma construction at the point where ganglion cells are identified.

Bowel continuity reconstruction with a definitive surgical treatment may include one of the techniques of transanal endorectal pull-through operation using open or laparoscopic approach [17, 18].

Conclusions

Intestinal perforation is a rare presenting form of Hirschsprung’s disease and it is seen especially in long segment disease.

Early recognition of perforation contributes to successful management. Prokinetics could contribute to the development of perforation and they should be used with caution.