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Early Diagnosis of Adhesive Disease in Children

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Abstract: Background: Adhesive intestinal obstruction is a pressing problem in pediatric surgery. Early diagnosis and treatment options for both early and late forms remain controversial.

Objective: To early clarify the proposed diagnosis of adhesive intestinal obstruction in children previously operated on for acute appendicitis.

Materials and Methods: From 2020 to 2024, 76 of 382 children at the 2-2 City Children's Surgical Clinical Hospital (2-2DCCH) underwent surgery for acute appendicitis. Adhesive disease was recorded (33 early, 43 late). The patients ranged in age from 2 to 18 years with signs of abdominal adhesive disease. Of these, 44 were boys (57.8%) and 32 were girls (42.2%).

Results: The diagnosis was based on the patient's medical history, clinical examination, abdominal ultrasound, laparoscopy, and laparotomy.

Keywords: Intestinal obstruction, adhesions, laparotomy, intestinal paresis.

Introduction: Traumatic injury to the abdominal lining during surgery and inflammatory processes in the abdominal cavity play a significant role in the development of adhesions. Depending on the timing of their onset, adhesions may take the form of flat and membranous deposits or connective tissue bands [1, 2, 3]. Any laparotomy, even performed under aseptic conditions, can predispose to adhesion formation due to the inevitable damage to the serous membrane caused by tampons and surgical instruments [5, 6, 7]. In the postoperative period, adhesions in most children proceed within physiological limits and do not cause complications. However, in some cases (especially with persistent intestinal paresis), multiple adhesions adhere intestinal loops, disrupting the passage of contents and creating conditions for the development of obstruction, which is of an obstructive nature [3, 2, 4].

Formed cord-like adhesions usually do not manifest, but in some children, months or years after surgery, they can cause strangulating intestinal obstruction [1, 2, 3, 4].

Adhesive obstruction most often complicates acute appendicitis [2-3].

The relevance of the adhesion problem is that in most cases, the treatment and preventive measures taken remain ineffective, leading to adhesion formation.

The aim of the study was to early clarify the presumptive diagnosis of adhesive obstruction in children previously operated on for acute appendicitis.

METHODS

Among 382 children operated on for acute appendicitis at the Second City Children's Surgical Clinical Hospital (2-GDCCH) from 2020 to 2024, adhesive disease was observed in 76 children (early in 33, late in 43). The children ranged in age from 2 to 18 years with signs of abdominal adhesive disease. Of these, 32 (42.2%) were girls and 44 (57.8%) were boys. A medical history and physical examination of the abdomen were reviewed. Children with somatic or endocrine diseases were consulted by related specialists and received the

necessary treatment.

The following research methods were used in the study:

Dynamic observation of symptoms: The child complained of intermittent abdominal pain. The uniform abdominal distension changed slightly, becoming asymmetrical due to individual intestinal loops becoming gas-filled. Palpation of the abdomen was painful. Stroking the abdominal wall increased peristalsis and caused repeated attacks of pain. Auscultation revealed occasional faint intestinal sounds.

To assess the condition of the small intestine, ultrasound, MSCT, and abdominal X-ray were performed, along with determination of aminotransferase levels (ALT, AST), and serum bilirubin levels.

The effectiveness of early diagnosis and treatment was assessed based on the dynamics of patient complaints, clinical signs of the underlying disease, and comparison of ultrasound data before and after treatment.

RESULTS AND DISCUSSION

When examining the premorbid background, noteworthy is the children's history of various illnesses (acute respiratory viral infections, tonsillitis, bronchitis, cholecystitis, cystitis, and pyelonephritis). Early adhesive obstruction, which develops during the period of subsidence of peritoneal symptoms and improvement of the child's general condition, manifests itself most clearly. The child suddenly experiences paroxysmal abdominal pain. Vomiting occurs, initially of food, then with bile. Loud intestinal sounds are audible. Percussion reveals tympanitis over the distended intestinal loops. Palpation of the abdomen may reveal increased peristalsis and repeated attacks of pain. Between attacks, the abdomen is soft and palpable. Gas is passed spontaneously, and stool may be spontaneous. Acute adhesive intestinal obstruction (AAO) was observed in 33 patients (43.5%), and late adhesive intestinal obstruction in 43 (56.5%). Acute adhesive intestinal obstruction was managed conservatively in 26 patients, of whom 7 (21.2%) were subsequently readmitted due to partial intestinal obstruction, as the underlying cause of the adhesive obstruction was not corrected. Surgical adhesion separation was required in 7 patients.

Among the patients in the second group, 43 were diagnosed with chronic adhesive intestinal obstruction. Of these, 35 patients received a traditional course of conservative anti-adhesion therapy; subsequently, 8 children were readmitted with signs of partial intestinal obstruction. Surgery was required in 8 patients: open adhesiolysis combined with pre- and postoperative courses of hydrocortisone and cuprenil.

Small intestinal ultrasound was performed in 76 children aged 2 to 18 years to confirm the presumptive diagnosis of abdominal adhesions.

We found that the ultrasound image of small intestinal adhesions in the examined children had a characteristic symptom complex that underwent consistent changes over the course of the disease. The ultrasound image of intestinal and abdominal changes in patients with adhesive obstruction is directly proportional to the time of disease onset. The level of obstruction was assessed based on the location and extent of dilated, engorged intestinal loops. In cases of high proximal small bowel obstruction, the small bowel loops occupy only the left half of the abdominal cavity. In this case, excess fluid is detected in the lumen of the duodenum and stomach. Over 12 hours after illness onset, 12 children (15.7% of those examined) had over 100 ml of free fluid in the abdominal cavity. Intestinal loop dilation up to 3 cm in diameter was detected in adhesive intestinal obstruction in six preschool-aged children, with loops over 3 cm in diameter. The pathologically altered intestines of the analyzed children with adhesive intestinal obstruction were characterized primarily by pendulum-like peristalsis.

Only five children had decreased peristalsis at the onset of illness. The early diagnostic yield of ultrasound examination for small bowel adhesive obstruction in developing cases, as well as the specificity of the above-mentioned ultrasound findings, accounted for 92% of all studies.

CONCLUSIONS

Ultrasound, with its high information yield, is a unique and accessible method for early diagnosis of adhesive intestinal obstruction in children. It not only confirms a presumptive diagnosis but also determines a differentiated approach to treatment.

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