

# Acquired Mechanical Intestinal Obstruction in Children

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**Abstract:** CHILDREN ACQUIRED MECHANICAL INTESTINAL OBSTRUCTION. In this article the main principles of diagnosis the clinical symptoms of diseases causing vomiting syndrome of children with acquired mechanical intestinal obstruction are unified and generalized. The general conception of the acquired mechanical intestinal obstruction is given here. Peculiarities of clinical course and diagnostics and differential diagnostics of intussusception of intestine and adhesive obstruction of children are described in this article. Medical and diagnostic policy is proved. Authors conclude, that the earliest diagnosis of diseases which cause children acquired intestinal obstruction, decrease the quantity of complications and lethality.

**Keywords:** mechanical intestinal obstruction, vomiting syndrome, children.

**Introduction.** The frequency of acute surgical diseases of the abdominal organs is common, among acute surgical diseases of the abdominal organs, acquired intestinal obstruction ranks second in frequency, second only to acute appendicitis, at the same time, the number of deaths with it is greater than in other acute surgical diseases of the abdominal organs combined [2,4,5]. The frequency of intestinal obstruction in relation to acute surgical diseases of the abdominal cavity can reach 9.4% [7,11]. Most often in children there is intestinal intussusception and adhesive intestinal obstruction, much less often - obstruction due to Meckel's diverticulum, torsion and nodulation of the small and large intestine, strangulated internal hernias. General statistical indicators of legitimacy in patients with mechanical intestinal obstruction, according to V.P. Petrova and I.A. Yeryukhin (1989), make up 18-20%. P.P. Tomashuk et al. (1991), on the basis of a unique statistical analysis, state that mortality from early adhesive intestinal obstruction in the territory of the former USSR ranged from 16.0 to 95.2%. The same authors cite their own observations: of the total number of deaths in 21.4%, the cause was obstructive, in 19.5% - strangulation, and in 59.0% - a mixed form of complete intestinal obstruction.

**General concepts of the syndrome of intestinal obstruction.** Intestinal obstruction is a syndrome that occurs during a variety of pathological processes, manifested by impaired peristalsis and evacuation function of the intestine, characterized by a different clinical course and morphological changes in the affected part of the intestine [3,7]. A simpler and at the same time capacious definition says that intestinal obstruction is a violation of the migration of the food bolus through the gastrointestinal tract.

Back in the first half of the last century, 2 types of intestinal obstruction were identified: mechanical and dynamic. Wahl (1889) divided mechanical intestinal obstruction, depending on the degree of intestinal circulatory disorders, into strangulation and obturation. Among the many classifications based on the Wahl principle, the most convenient for practical application was the classification of D.P. Chukhrienko (1958), which subdivides all types of obstruction by origin (congenital and acquired), by the mechanisms of occurrence (mechanical and dynamic), by the presence or absence of circulatory disorders in the intestine (obstructive, strangulation and combined forms), by the clinical course (complete and partial, the latter is divided into acute, sub-acute, chronic and recurrent).

In addition, depending on the level of obstruction, intestinal obstruction is divided into high and low. The border between high and low intestinal obstruction is the initial section of the jejunum.

**Etiology and pathogenesis.** The causes of intestinal obstruction are usually divided into predisposing (these include the anatomical and physiological characteristics of the child's body) and producing (precedent). According to modern data, the pathogenesis of acute mechanical intestinal obstruction is based on the phenomena of shock [6,7]. The intake and accumulation of large amounts of fluid and electrolytes in the intestinal lumen above the level of obstruction with simultaneous sharp inhibition of

reabsorption leads to stretching of the intestinal wall and increased fluid secretion. Developing simultaneously with an increase in secretion and a decrease in reabsorption, the stasis of intestinal contents favors the growth of microorganisms and flatulence. Developing with obstruction, repeated vomiting leads to exicosis, hyponatremia. A decrease in the sodium content causes hyperproduction of aldosterone, which leads to a retention of sodium and chlorine in the body and a simultaneous increase in the excretion of potassium in the urine, followed by the development of hypokalemia. In the later stages of mechanical obstruction, deeper disturbances in water and electrolyte balance and metabolism develop. The breakdown of the cell mass is accompanied by the release of a large amount of potassium and hyperkalemia occurs due to oliguria. The patient's body loses significant amounts of both extracellular and cellular protein, its qualitative composition changes [3]. With strangulation obstruction, in addition to protein losses, there are also losses and exclusion of erythrocytes from the circulation. Yu.M. Dederer (1971) and Welch (1958) found that with extensive strangulation, such losses can exceed 50% of the total number of erythrocytes.

Hypovolemia resulting from fluid loss and progressive tissue hypoxia lead to a switch in metabolism to anaerobic glycolysis, which leads to metabolic acidosis. Hypoxia and ischemia of the intestine, an increase in the proteolytic activity of blood serum lead to the formation and entry into the bloodstream of powerful vasoactive polypeptides, lysosomal enzymes, which cause a drop in blood pressure, a decrease in cardiac output, and a decrease in coronary perfusion [7].

**General symptomatology.** The clinical picture of acute mechanical intestinal obstruction depends on a number of reasons: the level of obstruction, the type and degree of obstruction, the duration of the disease, as well as the causes that caused it. It should be noted that high acquired intestinal obstruction is extremely rare in the practice of a pediatric surgeon and pediatrician, so it makes sense to consider the main clinical manifestations of low intestinal obstruction. The main clinical symptoms of intestinal obstruction include acute cramping (periodic) abdominal pain, changes in the configuration of the abdomen, dyspeptic and dysphagic symptoms.

Abdominal pain is the earliest and most persistent sign of mechanical intestinal obstruction. This pain is extremely intense, prone to increase, most often not localized, is cramping (periodic) in nature. With strangulation obstruction, the pain is especially excruciating, quite often the children moan or scream ("ileus cry").

In the intervals between pain attacks, patients can calm down somewhat. Often in children with mechanical intestinal obstruction, especially during strangulation, pain radiates to the external genitalia, inner thigh, lower back, under the shoulder blade. Due to the lack of a clear localization, pain migration in this category of patients is not typical.

With the progression of the phenomena of intestinal obstruction and the growth of endotoxemia, shock occurs, after which the pain may subside. Therefore, the weakening of abdominal pain against the background of a deterioration in the general condition is considered a poor prognostic sign.

**Adhesive disease, adhesive intestinal obstruction.** Adhesive disease is a disease that develops as a result of the onset and progression of the adhesive process in the abdominal cavity [1,2,7]. In the occurrence of adhesions, they play a role as the influence of external factors (surgery, trauma, inflammatory processes, etc.),

and properties of the organism. According to Perry et al. (1955), in 79% of patients, adhesions are the result of surgical interventions, in 18% of inflammatory processes, and in 3% they are congenital. One of the main causes of adhesion formation is peritoneal injury (mechanical, chemical, thermal).

Among the various surgical interventions leading to the formation of adhesions, the most common in children is appendectomy (about 70%), then surgery for intestinal obstruction (about 15%), abdominal trauma with damage to internal organs (up to 10%), other operations account for about 5% [4, 10].

Acute adhesive obstruction can progress according to the type of strangulation and obturation obstruction. According to the time of occurrence, it is divided into early (the first 10 days from the date of the operation), early delayed (11-30 days after the operation) and late (a month later and later after surgery).

Strangulation adhesive obstruction occurs as a result of infringement or twisting of intestinal loops around the mesenteric cord-like adhesion.

The picture of rapidly progressing strangulation obstruction with severe constant pain throughout the

abdomen is clinically manifested. Obstructive adhesive obstruction occurs due to kinking or compression of the intestine by adhesions without involvement of the mesentery in the process and is characterized by periodic cramping pain, vomiting. In general, the clinical manifestations of acute adhesive intestinal obstruction are nonspecific and fully correspond to the general symptoms of acute mechanical intestinal obstruction. A distinctive feature is the presence of a compromising postoperative scar on the anterior abdominal wall.

**Intestinal intussusception.** Invagination is the introduction of any segment of the intestine into the lumen of an adjacent section of the intestine. This disease has been known for a long time, the first to describe the intussusception were Realdus Columbus, Fabricius Goldanus and Riolan at the end of the 16th century, in more detail - Payri in 1677.

Depending on the location, direction of movement and structure of the head, the following types of invaginations are distinguished:

1) small intestine: when the head of the invaginate is any part of the small intestine, and the entire invagination is formed only from the small intestine;

2) colonic: the head of the invaginate is the large intestine and Eesinvaginatsiya is formed only from the large intestine;

3) blind colon: the head of the invaginate is the caecum, and the appendix and the ileum are drawn together with the caecum into the lumen of the colon, bypassing the Bauginian shutter;

4) ileocolic: the head of the intussusceptum is formed by the ileum, which penetrates into the large intestine through the Bauginian valve without involving the caecum and appendix;

5) jejunogastric: the jejunum is introduced into the stomach through the duodenum or gastrointestinal anastomosis;

6) diverticulo-intestinal: Meckel's diverticulum invaginates into the ileum;

7) appendico-cecal: the appendix is introduced into the caecum;

8) complex: intussusception consists of 5, 7 or more cylinders; 9) multiple: implementation occurs in several places of the gastrointestinal tract. The most common is ileocolic invagination (45-60%), blind colon (20-25%), large intestine (12-16%), small intestine (10-16%).

Intestinal intussusception usually occurs in the direction of peristalsis (descending intussusception), less often the introduction occurs in the antiperistaltic direction (retrograde or ascending intussusception). In advanced cases, the intussusceptum can reach the ampulla of the rectum and fall out through the anus. Also described as options for blind colonic invagination are lateral or partial penetrations of one wall of the caecum, its dome (Blauel's form), intussusception of the caecum haustra.

Conclusion.

Vomiting syndrome in children with acquired intestinal obstruction occurs as a result of impaired migration of the food bolus along the gastrointestinal tract and is manifested by acute cramping (periodic) abdominal pain, changes in the configuration of the abdomen, dyspeptic and dysphagic symptoms.

The frequency of mechanical intestinal obstruction in children in relation to acute surgical diseases of the abdominal cavity can reach 9.4%. The most common invagination of the intestine and adhesive intestinal obstruction. Early diagnosis of diseases that cause the syndrome of acquired intestinal obstruction in children helps to reduce the number of complications and mortality.

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