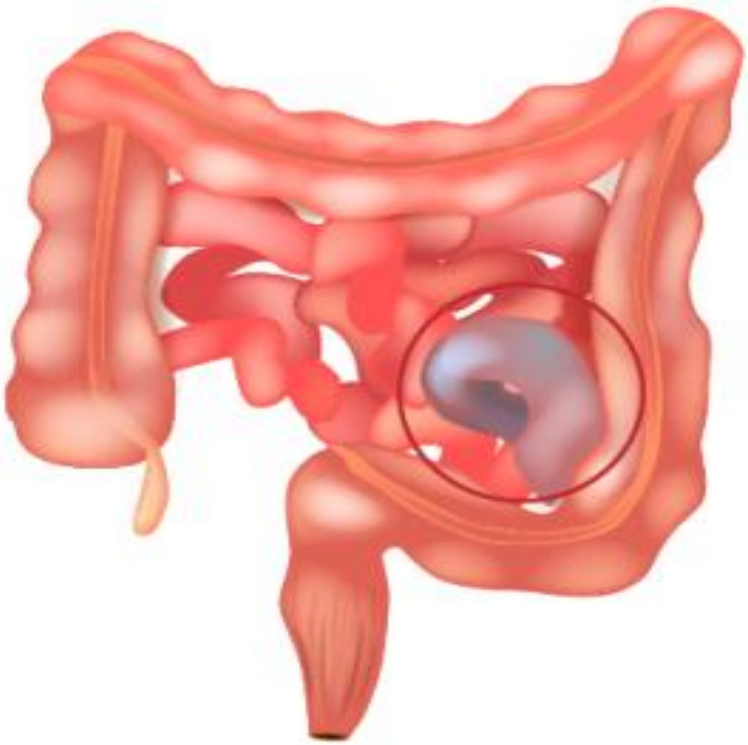
ROYAL METROPOLITEN UNIVERSITY

Department of Clinical Disciplines

Acute intestinal obstruction

Educational and methodical manual



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Compiled by:

Toktosunov U.T.,

Nazir Muhammad Imran,

Jaxymbaev N. B.

Saliev A.Zn.

The educational and methodical manual is devoted to acute intestinal obstruction. Objectives and tasks are spelled out in a form understandable to students. The presentation of the material is intended to provide students with a unified picture, since this material is based on a universally recognized academic structure in the world, starting with definition, etiology / pathogenesis and ending with postoperative monitoring and prevention. In order to check the level of students' knowledge, control questions, tests and tasks, and situational problems are given.

The educational and methodical manual is written in English at the highest level and is intended for international students of the 6th semester of the Faculty of "Medical Science" of the RMU.

Reviewers:

Doctor of Medical Sciences, Professor of the Department of Clinical Disciplines RMU Kenzhaev M.G.

Doctor of Medical Sciences, acting Professor of the Department of Faculty Surgery named after Kakish Ryskulova of I.K. Akhunbaev KSMA Aitbaev S.A.

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1. Introduction

1.1. Relevance:

In the world, the frequency of acute intestinal obstruction is about 5 cases per 100 thousand people, causing from 3 to 5% of patients ' admissions to surgical hospitals. Among all patients with mechanical intestinal obstruction, acute small bowel obstruction ranges from 64.3 to 80% of cases and is characterized by a more severe clinical course and a worse prognosis of the disease. This is due to the continuing high mortality rate in this pathology. According to various authors, it ranges from 5.1 to 8.4%, taking the leading place among all urgent diseases.

The economic significance of the treatment of this pathology is clearly illustrated by the following comparison: the direct costs of the health system for the treatment of patients with acute small bowel obstruction in Finland are approximately equal to the costs for the treatment of patients with stomach cancer and rectal cancer. And according to N. F. Ray et al. (1994), more than 300,000 patients are operated on annually in the United States for adhesive intestinal obstruction, which requires a financial cost of $ 1.3 billion [1].

1.2. The purpose of the lesson

The formation of the main professional competencies of a specialist of a medical doctor, provided for by the state educational standard of higher professional education in the specialty "medical care" within the didactic module "emergency abdominal surgery", the didactic unit "acute intestinal obstruction" on the basis of:

- acquisition of knowledge on general issues of etiology, classification, and syndromic diagnosis of acute intestinal obstruction (AIO),
- study of clinical options and features of the diagnosis and treatment of various nosologies that cause acute intestinal obstruction,
- application of methods of physical, laboratory and instrumental examination of patients with typical manifestations of intestinal obstruction.

1.3. Tasks of the lesson

When mastering the materials of the lesson, the student should have the following theoretical and practical clinical and diagnostic competencies:

Theoretical competencies include:

-Etiology and pathogenesis of AIO.

-Main nosological forms, proceeding with a syndrome of the window.

-Classifications.

-Clinical manifestations of AIO depending on the etiology.

-Basic methods of clinical, laboratory and instrumental diagnostics.

-Features of preoperative preparation of patients with AIO.

-Stages of the surgical manual in the treatment of AIO, methods for assessing the viability of the intestine in AIO.

As a result of mastering practical competencies, the student must:

-Conduct a survey of patients with AIO syndrome, identify anamnestic features inherent in various clinical forms of AIO.

-Perform an objective study of patients with the determination of specific symptoms (Val, Schlange, Kivul, Sklyarov, Spasokukotsky, Grekov, Tsege-Manteifel).

-Make a differential diagnosis of the main clinical forms of AIO.

-Interpret the main clinical indicators and data of radiological studies used for the diagnosis of AIO.

Duration of the lesson: Academic hours are allocated for the study of the topic.

2. Definition

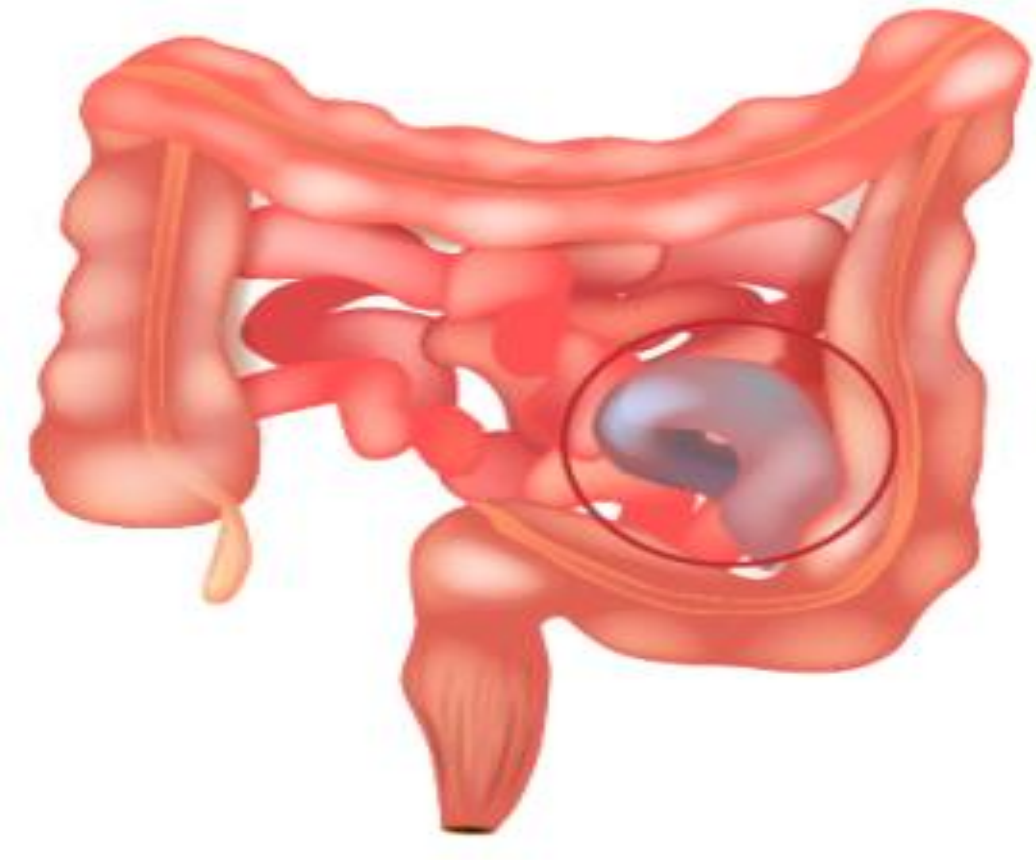

Fig. 2.1.Intestinal obstruction

Acute intestinal obstruction- a syndrome that combines various non-oncological diseases that lead to a violation of the passage through the intestine, due to a mechanical obstacle, or a lack of motor function of the intestine.

3. Etiology and pathogenesis

Etiology

Mechanical: adhesions (80-91%), Crohn's disease (0.7-3%), inversion (4-6%), intussusception (3-5%), bezoar (1.2-4%), gallstones (0.5-6%), foreign bodies (0.2-1%), other causes (0.5-3%)

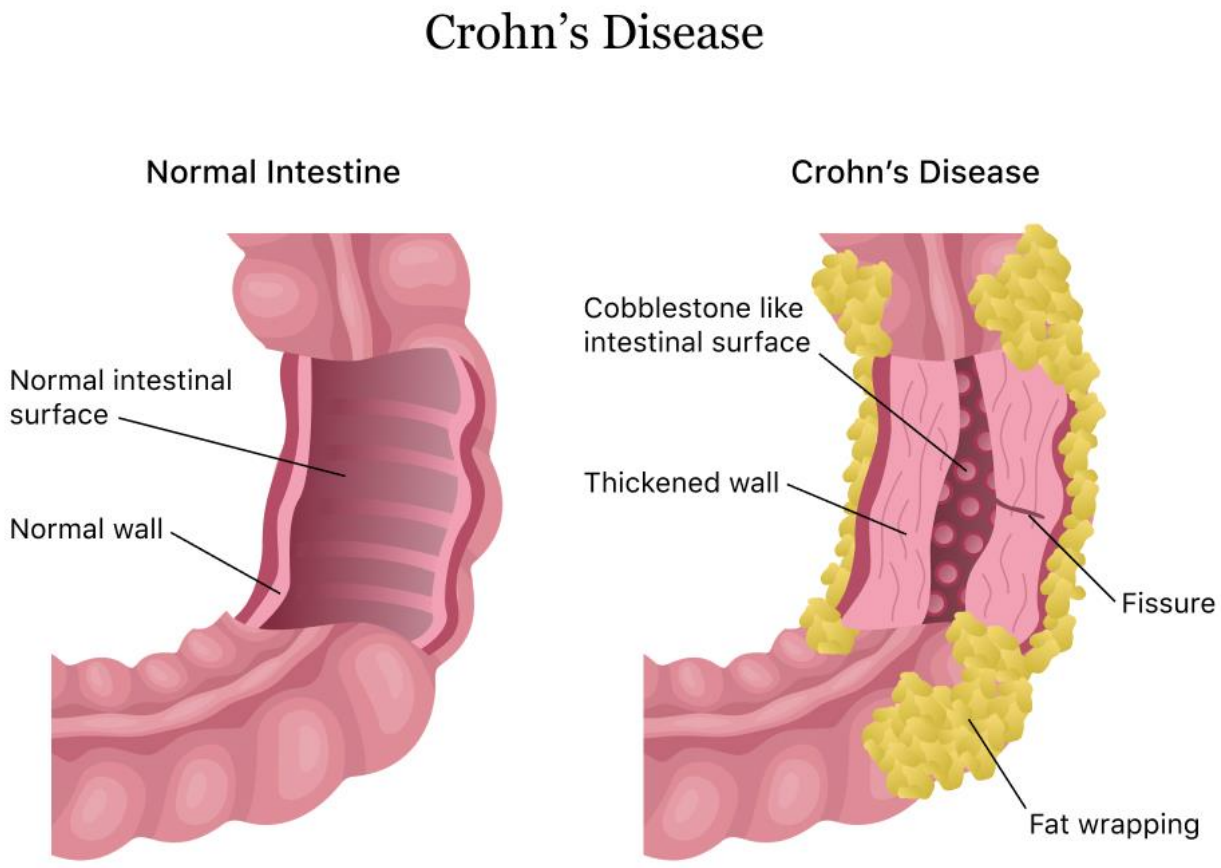

Fig.3.1. Crohn's disease

Dynamic (Functional) intestinal obstruction is a type of obstruction that requires clarification of the cause. Most often, under the mask of this syndrome, inflammatory intra-abdominal complications (peritonitis, ulcerative colitis, etc.), metabolic disorders (uremia, diabetes mellitus, hypothyroidism, hypokalemia, metabolic disorders of Ca++, Mg++), neurogenic (spinal cord injury, tumor, hematoma, retroperitoneal phlegmon, renal colic), overdose of drugs (opioids, cholinolytics, psychotropic, antihistamines), or disorders of mesenteric blood flow.

Pathogenesis

The development of AIO triggers a cascade of diverse pathological processes affecting all organs and systems. However, the central link in the development of obstruction is the small intestine itself, which is the primary and main source of endogenous intoxication. Progressive overgrowth of the intestinal loops and violation

of intestinal microcirculation, leads to the suppression of all functions of the small intestine (motor, secretory, and absorption), and ultimately a disorder of homeostasis. Hypoxic damage and intramural ischemia of the intestinal wall leads to a violation of the barrier function of the mucosa and, as a result, translocation of bacteria and their waste products into the portal vein system and lymphatic vessels. The small intestine in AIO becomes a powerful source of intoxication, aggravating homeostatic disorders and decompensating functional intestinal disorders, thereby closing the "vicious circle". This contributes to the development of severe intraabdominal complications, and their frequency is directly related to the severity and duration of AIO, especially in elderly and senile patients.

Pathophysiological changes when the window is particularly expressed in the form of a strangulated intestinal obstruction. Hemodynamic disorders caused by a reduction in arterial inflow and a violation of venous outflow due to compression of the vessels of the mesentery of the intestine come to the fore. The released tissue kinins, as well as histamine, disrupt the permeability of the vascular wall. This contributes to the appearance of interstitial edema, aggravated by a disorder of colloid-osmotic and ion-electrolyte relationships between plasma and interstitial fluid. and only then there are signs of a violation of the passage through the intestine with fluid sequestration and volemic disorders. Against this background, under the influence of severe ischemia, additional exposure to microbial and tissue endotoxins, the destruction of the intestinal wall occurs. In case of strangulation obstruction, the barrier function of the mucosa is disrupted at an earlier time, and translocation of the bacterial flora occurs even in the absence of intestinal necrosis.

With cholelithiasis, the course of the disease has a distinct remetiratory character with violent clinical manifestations, alternating with relatively long (2-6 hours) periods of "imaginary well-being".

Intussusception is most common in children and middle-aged people. The pathogenesis of the disease is quite complex and poorly understood. Most often (90% of cases), invagination develops in patients with congenital anatomical features of the structure of the intestine or the presence of organic pathology – epithelial or

submucosal formations, inflammatory changes, the presence of intestinal ulcers. The formation of invaginate occurs due to impaired motor function and impaired coordination of peristalsis of various parts of the intestine against the background of provoking factors – errors in diet, trauma, etc. Ileocecal (45-68%), small bowel (10-18%), and large bowel (8-15%) intussusception are distinguished by localization.

The predisposing factor for the development of intestinal inversion and nodulation are congenital anomalies, a long mesentery of the intestine, the presence of abdominal adhesions. Of the producing causes, the greatest importance belongs to errors in the diet, overeating, and increased intra-abdominal pressure. The severity of disorders and clinical manifestations directly depends on the degree of inversion.

Thus, with the rotation of the intestine at 180o, the disease is more consistent with obturation obstruction with minimal signs of intestinal nutrition disorders. While with an inversion of more than 270o, there is a pronounced ischemia of the organ with a rapid course of the disease and early development of intestinal necrosis.

According to the localization, the most common is the sigmoid inversion (60-75%), less often the blind (20-35%), the small (7-18%) and the transverse colon (3-5%). Nodulation is the most severe, which is relatively rare – in 3-5% of cases. As a rule, the process involves a large area of the small intestine with pronounced necrobiotic changes and severe hemodynamic and systemic disorders.

4. Classification.

In tactical terms, it is recommended to divide the disease into 2 forms – strangulation and obturation

The level of credibility of recommendation A (The level of reliability of evidence 1c).

Comments: It is impractical to separate out the so-called mixed form, which has signs of both strangulation and obturation obstruction. This introduces uncertainty, both in terminology and in the tactical plan, not allowing for timely treatment of patients.

1. Obturation-violation of passage through various parts of the intestine without disrupting the blood supply to the organ. The most common cause of this form are adhesions of the abdominal cavity, gall stones, bezoars.

2. Strangulation-a violation of the blood supply to the intestine at the site of the passage violation, occurs with adhesions of the abdominal cavity (as a rule, this is a single extrude), intussusception, inversion and nodulation. This is the most dangerous form and it can leak:

- with necrosis
- without organ necrosis

The level is distinguished by:

1. Small bowel obstruction: high (jejunum) -33.1%, and low (ileum) - 62.1%
2. Colonic obstruction – 4.8%

5. Diagnostics

Complaints and anamnesis.

It is recommended to find out from the patient the nature of pain, their intensity.

It is recommended to record the presence of vomiting; its frequency, volume and nature, withdrawal of stool, gases. (Level of reliability of evidence 4).

Comments: It is important to determine the duration of the disease, the presence of similar episodes earlier. The transferred early operations allow to suspect the adhesive nature of the obstruction. And the presence of inflammatory intestinal diseases, cholelithiasis, performed vagotomy, allow us to suspect other causes of small bowel obstruction.

Physical examination.

It is recommended to perform auscultation, percussion and palpation of the abdomen. The presence, localization and nature of postoperative scars are determined. The sites of the typical location of abdominal wall hernias are purposefully examined. The degree of dehydration is assessed – turgor of the skin, dry tongue, thirst; measurement of pulse, blood pressure

- It is recommended to perform thermometry
- It is recommended to perform a finger rectal examination, in women, an additional vaginal examination is performed.
- It is recommended to perform a stomach probe with an assessment of the amount and nature of the discharge.

(Level of reliability of evidence 4).

Comments: The nature, severity of clinical manifestations and severity of disorders largely depend on the cause, form and level of AIO. For non-tumor AIO, the acute onset of the disease is typical - the sudden appearance of cramping abdominal pain, vomiting, bloating and the absence of stool and the absence of gas.

If in the first hours there are no violations of the water-electrolyte balance and signs of endotoxicosis, then in the subsequent overgrowth of the loops of the small intestine, increasing intraluminal sequestration of fluid leads to the development of metabolic disorders, accompanied by thirst, dry skin, adynamia, tachycardia, hypotension. The extreme manifestation of obstruction is the addition of a paralytic component, which is manifested by a change in the nature of pain - they become permanent, contractions are reduced. Vomiting becomes copious with stagnant contents ("fecal" vomiting), intoxication appears.

The strangulation form of obstruction is distinguished by a special course. In the classical sense, the clinical picture is characterized by a severe course and rapid development of complications – intestinal necrosis and peritonitis. The most characteristic are the following clinical signs of this form of the disease: acute onset (the duration of the disease is less than 12 hours), severe pain, of a permanent nature, weakening or absence of peristalsis, tachycardia, sometimes fever and rapid deterioration of the general condition of the patient. (The confidence level of evidence 2b)

Comments on: typical manifestations of strangulation are not always found in clinical practice. Often, the clinical course is erased. Morphologically, this is associated with a moderate infringement of the mesentery, when there is compression of the veins without a pronounced violation of arterial blood flow.

Often, a violation of the blood supply to the intestine occurs in far-advanced cases of obturation obstruction. A significant increase in intraluminal pressure leads to compression of blood vessels, violation of microcirculation in the intestinal wall, which leads to the development of secondary ischemia. The low severity of local symptoms, the absence of signs of peritoneal irritation is masked by a decrease in previous cramping pains and the appearance of endotoxicosis.

A feature of the clinical picture with a high level of obstruction is a large loss of gastric, pancreatic secretions, bile due to copious repeated vomiting and the rapid development of water-electrolyte disorders (hypohydrotation, metabolic alkalosis, hypocalemia, hypochloremia, hyponatremia). At the same time, as a rule, there is no pronounced bloating, for some time there is still a discharge of gases and the presence of stool (The confidence level of evidence 4).

While with low obstruction, the signs of a violation of the passage through the small intestine - pain syndrome-come to the fore, there is pronounced bloating, while vomiting is less common, and the phenomena of endotoxicosis quickly progress. In the future, as the process progresses, there is an overgrowth of the intestinal wall and an ischemic component is attached, the permeability of the intestinal wall increases.

The probability of developing infectious complications is much higher with low than with high small bowel obstruction. (The confidence level of evidence 4).

Laboratory diagnostics.

Laboratory diagnostic data do not play a significant role in establishing the fact of obstruction, but help to determine the presence and severity of metabolic disorders, acid-base state and signs of strangulation obstruction.

All patients admitted to the hospital are recommended to perform:

a general blood test

a general urinetest

a blood test for acid-base balance (ABB) a study of blood electrolytes, blood sugar, blood group, Rh factor.

(The confidence level of evidence 2C)

The presence of leukocytosis of more than 14x10 in the degree of 9l, the appearance of acidosis, amylasemia with a high probability indicates the presence of strangulation.

Instrumental diagnostics.

All patients are recommended to perform X-ray polypositional examination

Fig. 5.1 X-ray polypositional examination

The level of credibility of recommendation B (level of reliability of evidence 2b)

Comments: The study allows you to quickly and efficiently identify the obstruction and, in some cases, diagnose its cause. The effectiveness of the method is high and, according to numerous studies, reaches 87% in stating the fact and the level of obstruction. Plain radiography is performed while standing or laterobasal (in position on the left side) in severe patients. For small bowel obstruction, it is typical to have swollen bowel loops of more than 3 cm above the obstruction, containing gas and fluid levels (Cloiber bowls),

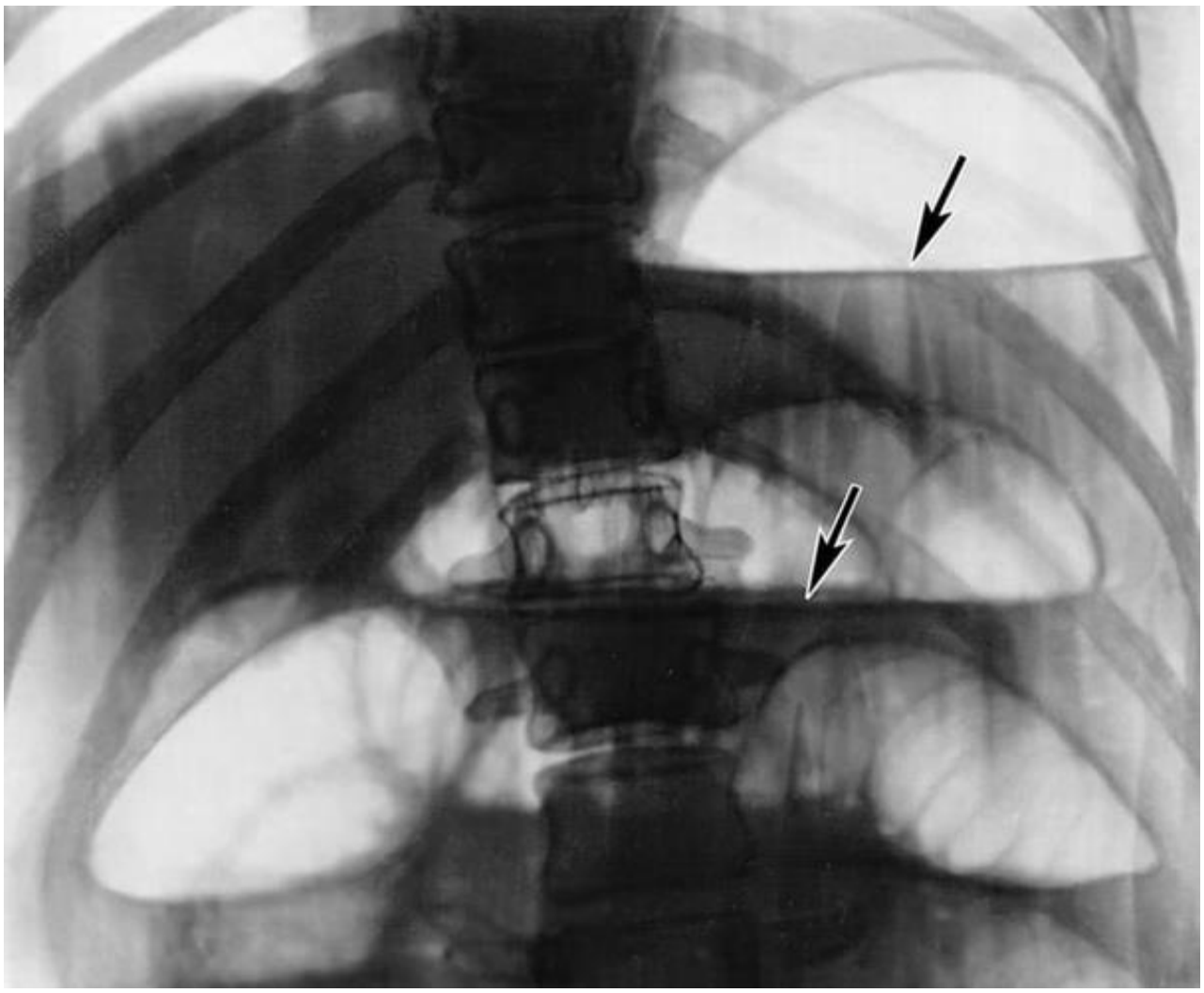

Fig. 5.2 Cloiber bowls

and no contents in the colon. Horizontal liquid levels are usually wide with a low gas bubble. There is a transverse striation corresponding to the Kerkring folds.

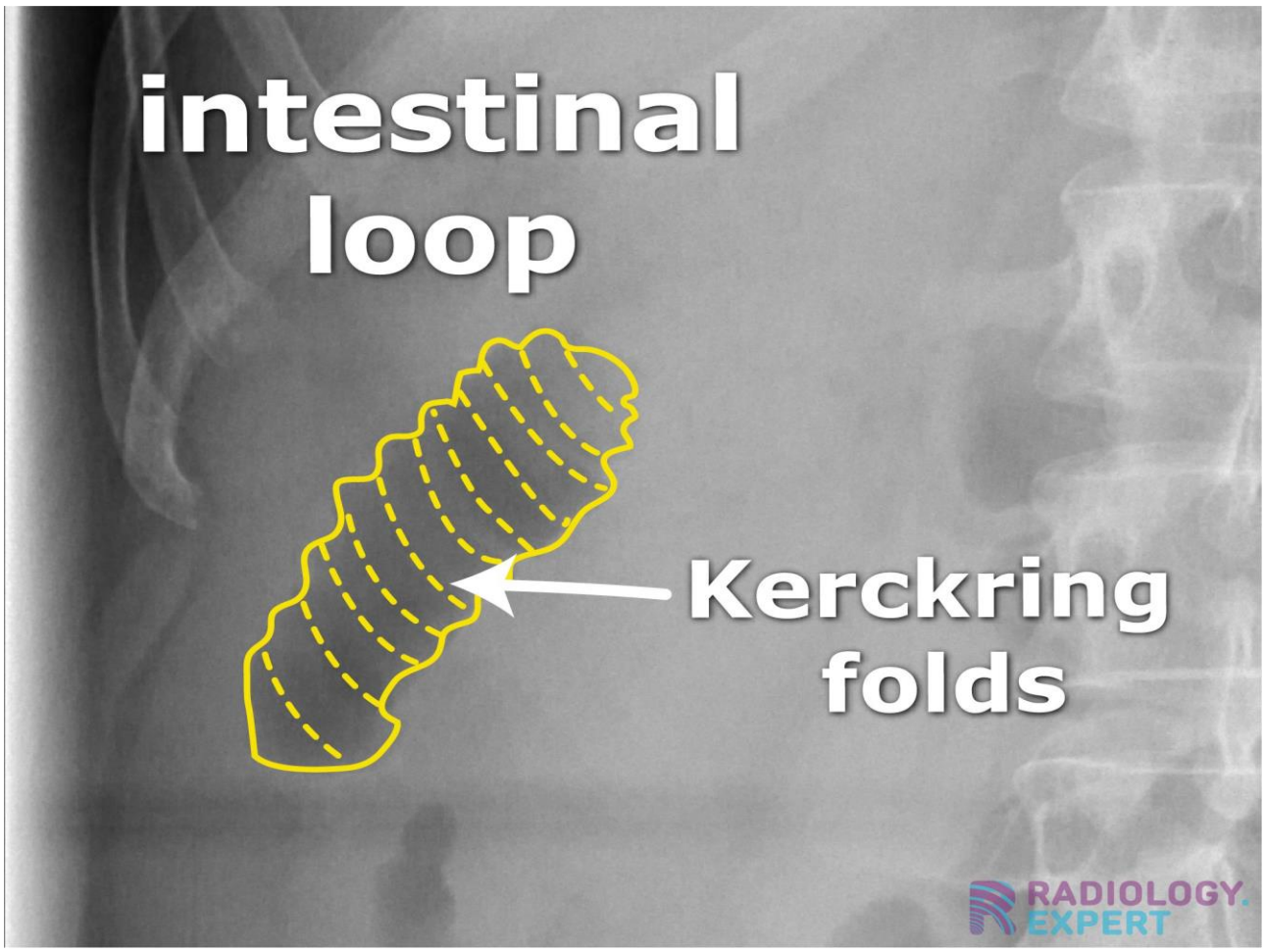

Fig. 5.3 X ray Kerkring folds

The determination of the level of obstruction is based on the visualization of the expanded loops of the small intestine in various anatomical areas of the abdominal cavity. Localization of the levels in the right abdominal cavity is more consistent with high obstruction. While when the obstacles are localized at the level of the ileum, the number of thickets increases and they are localized in all parts of the abdominal cavity. The sensitivity of the method in solving this diagnostic problem is 65,4 - 82 % (Evidence confidence level 2b).

When the colon is inverted, there is a pronounced dilatation of the colon with a characteristic symptom of a "car camera". The axis of the balloon-like swollen intestine is directed from the left iliac region to the right hypochondrium with sigmoid inversion and from the right iliac region to the left hypochondrium with caecal inversion.

When the bowel is obstructed by a gallstone, along with the typical signs of intestinal obstruction, a large concretion is often visualized, located outside the

projection of the hepatobiliary zone, characterized by the presence of gas in the bile ducts or gallbladder (aerocholia).

All patients with small bowel obstruction in the absence of signs of strangulation and peritonitis are recommended for enterography-a dynamic X-ray examination with an assessment of the contrast passage in the intestine.

Fig.5.4 CT-enterography

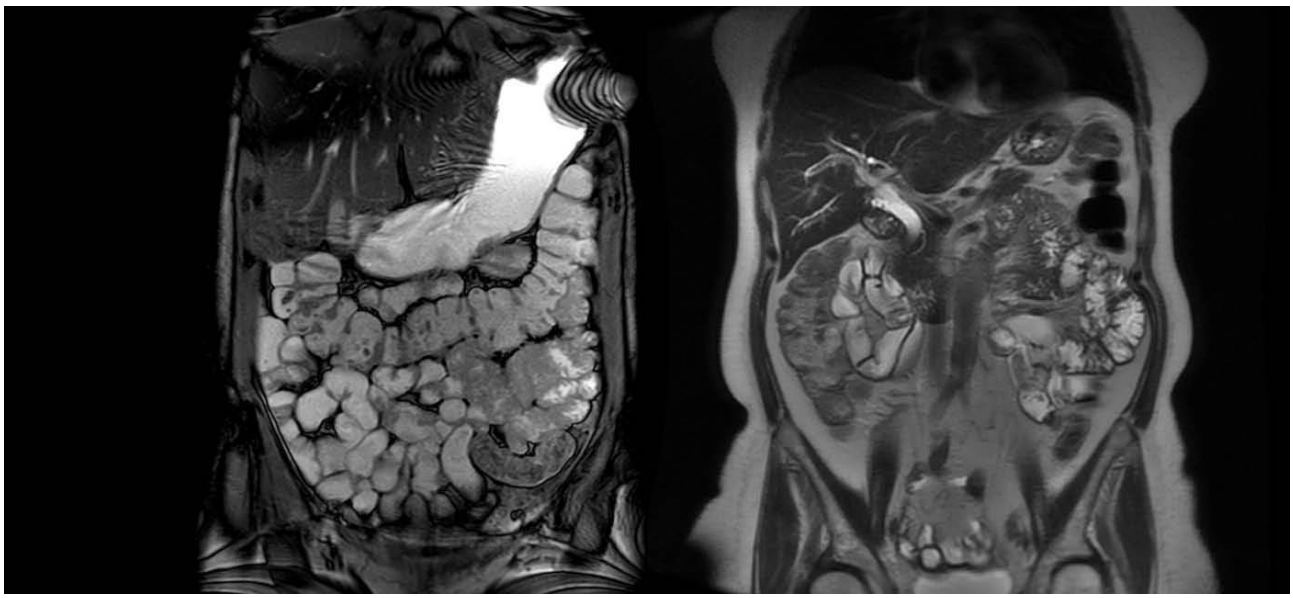

Fig. 5.5 MRI-enterography

The level of credibility of recommendation B (the confidence level of evidence 2a)

Comments: The method allows to confirm the fact of intestinal obstruction with high accuracy, to determine the severity, the level of obstruction (high, low), the nature of intestinal obstruction (mechanical, functional) and the dynamics of the course of the disease.

As a contrast agent, it is recommended to use water-soluble drugs

The level of credibility of recommendation B (the confidence level of evidence 2a)

Comments: water-soluble contrast agents have a significant advantage over barium suspension (does not slow down peristalsis, is well eliminated from the body, in case of contact with the abdominal cavity is easily removed) with comparable diagnostic effectiveness. Moreover, the drug due to hypoosmolarity has a therapeutic effect, allowing to increase the effect of conservative therapy to 89.4%.

The contrast agent is delivered to the gastrointestinal tract through a nasogastric probe or directly to the jejunum through an endoscopically installed nasointestinal probe. The latter method of administration of the contrast agent is the most preferable – it makes it possible to avoid the delay of contrast in the stomach.

Further, at intervals of 4 hours, X-rays of the abdominal cavity are made with an assessment of the state of the small intestine at a specific time stage of the study.

The data of dynamic probe enterography are the most reliable and objective criteria for evaluating the effectiveness of conservative therapy aimed at resolving acute small bowel obstruction. These include: a decrease in the number of horizontal fluid levels and Cloiber cups, the diameter of the small intestine, the appearance of pneumatosis of the colon, and, most importantly, the flow of contrast media into the colon. Ultrasound of the abdominal organs.

To determine the form of obstruction (strangulation, obturation), it is recommended to use ultrasound The level of credibility of recommendation C (the confidence level of evidence 2c).

Comments: Signs of impaired blood supply in the intestinal wall are: the presence of an expanded "isolated loop" of the small intestine with fluid, thickening, heterogeneity of the wall in combination with its akinesia, and accumulation of free fluid in the abdominal cavity. The effectiveness of ultrasound in the diagnosis of strangulation is 53.3-87%. The method makes it possible to effectively supplement the diagnostic program and determine the AIO in 72-94% of patients, its level in 66.7-80%, the cause in 48-63% of patients and assess the functional state of the intestine.

Typical ultrasound signs of intestinal obstruction are:

1. expansion of the diameter of the intestine more than 25 mm, associated with the deposition of fluid in its lumen;
2. thickening of the intestinal wall due to its edema;
3. visualization of the folds of the small intestine mucosa;
4. the presence of free fluid in the abdominal cavity;
5. pendulum-like movement of the contents of the intestine

(level of reliability of evidence 2)

To improve the effectiveness of ultrasound diagnostics, it is recommended to supplement the study with Dopplerography of the vessels of the small intestine (including intra-hepatic) in order to verify the strangulation nature of the obstruction. The level of credibility of recommendation C (the confidence level of evidence 2c).

Colonoscopy.

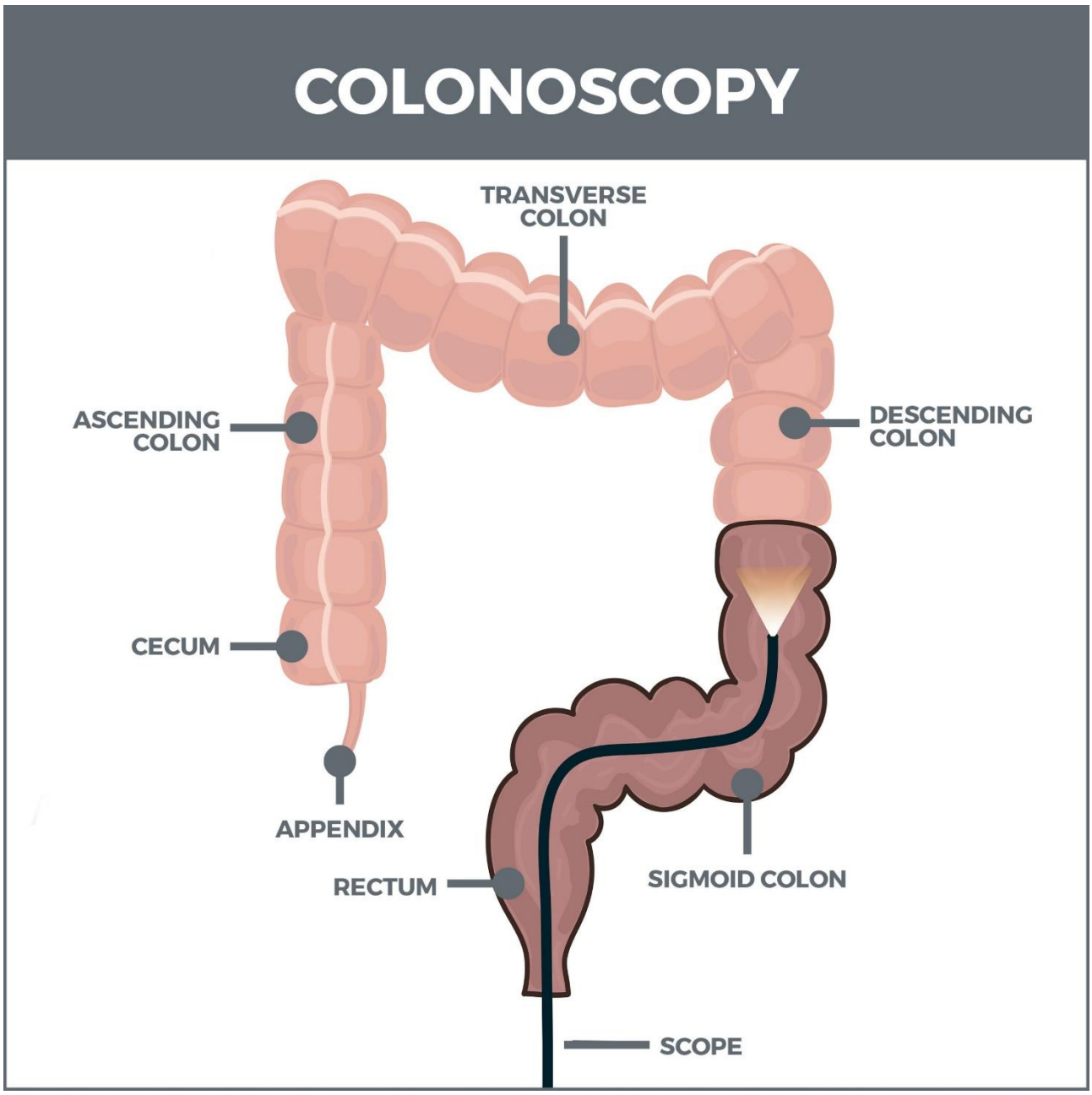

Fig. 5.6 Colonoscopy

The method is used for differential diagnosis of colonic obstruction (especially in cases of suspected sigmoid colon inversion). Inversion is characterized by a "whirlpool symptom" – a spirally narrowed segment of the colon.

Other diagnostics.

Diagnostic laparoscopy is not recommended for patients with cardiopulmonary diseases in the decompensation stage, grade IV obesity, disorders of the blood clotting system, pregnancy of more than 16 weeks. As well as patients with a history of traumatic or multiple (more than 3) operations on the abdominal cavity, launched

by AIO, with a pronounced expansion of the intestinal loops (more than 4 cm), which requires deep intubation and decompression of the small intestine, large non-fixed and giant hernias of the anterior abdominal wall, the presence of multiple fistulas on the anterior abdominal wall. The level of credibility of recommendation B (the confidence level of evidence 2b).

Comments: The study is limited due to the possibility of damage to internal organs in the conditions of the adhesive process of the abdominal cavity and expanded loops of the small intestine. The indication for it is, first of all, the need for a differential diagnosis with other surgical and gynecological diseases. In addition, laparoscopy allows you to assess the state of the abdominal cavity, the prevalence of the adhesive process and determine the possibility of laparoscopic dissection of the adhesions (adhesiolysis) as a minimally invasive method of resolving AIO.

Computed tomography (CT) with double (oral and intravenous) contrast is recommended for the diagnosis of AIO.

Fig. 5.7 CT

The level of credibility of recommendation C (the confidence level of evidence 2c)

Comments: The method allows you to determine the location and cause of obstruction, the diameter and pneumotosis of the intestine, the presence and amount of effusion in the abdominal cavity, to assess the arterial blood supply to the organ (ventral trunk, superior mesenteric artery, inferior mesenteric artery), to diagnose other abdominal pathology. According to different authors, the accuracy of the method in the differential diagnosis of mechanical and dynamic obstruction is 83-94%, the causes of obstruction are 85-87%, the level of obstruction is 93%, and strangulation is 43-85%.

Magnetic resonance imaging (MRI) is not recommended for the diagnosis of AIO. The level of credibility of recommendation C (the confidence level of evidence 2c)

Comments: The method has not yet found a specific place in the diagnostic algorithm for AIO. According to some researchers, it is comparable in efficiency to computed tomography and ultrasound-the sensitivity in the detection of AIO is 86-100%, and the specificity is 90-100%. The effectiveness of the study in identifying the cause is slightly lower-60-73% and the level of obstruction-63%. The main advantage of the method is its high resolution, the ability to detect morphological changes in the wall of the small intestine, characteristic of tumors, inflammation, ischemia and necrosis, as well as to determine the motor activity of the small intestine. However, MRI, despite its low invasiveness and potentially high efficiency in the diagnosis of AIO, has not yet found wide application in clinical practice. This is due not only to the high cost of the equipment and the study itself, the complexity of its implementation in an urgent situation, but also, most importantly, the lack of sufficient clinical material and experience that would allow us to determine the place of these studies in the diagnostic algorithm for intestinal obstruction [3-5].

6. Treatment

6.1. Conservative treatment.

Conservative therapy is recommended in patients with obturative form of AIO (without signs of strangulation) in the absence of pronounced introelectrolytic disorders and short (up to 36 hours) periods of the disease.

The level of credibility of recommendation B (level of reliability of evidence 2b)

Comments: the nature of conservative therapy, its duration depends on the cause, the severity of the disease, the level of obstruction, and the features of the clinical picture.

In case of obturated small bowel obstruction due to gallstones, bezoar is not recommended for conservative therapy.

The level of credibility of recommendation B (the confidence level of evidence 2b)

Comments: It should be remembered that the peculiarity of the course of these diseases is the remitting nature of the obstruction with episodes of"imaginary well-being". This often leads to a delay in the operation and aggravation of the condition. As the diagnosis is made, it is advisable to operate on patients in the next 6 hours without hoping for a full recovery of the passage through the small intestine.

For the treatment of adhesive small bowel obstruction, conservative therapy aimed at eliminating the obstruction is recommended to be used within 12 hours.

The level of credibility of recommendation B (the confidence level of evidence 2b)

Comments: This period is sufficient to identify the tendency to resolve the obstruction or, in the absence of such, to adequately prepare for urgent intervention. The complex of conservative treatment includes:

Decompression of the proximal gastrointestinal tract. Nasogastric intubation may be sufficient to eliminate loop overgrowth. More promising in this regard is ENID, which increases the effectiveness of conservative therapy to 60.5-100%, and reduces the duration of conservative therapy, speeding up the adoption of tactical decisions

(level of reliability of evidence 2b).

Infusion therapy;

Administration of antispasmodic drugs;

Siphon enema and endoscopic detorsion (with volvulus of the sigmoid colon);

Intravesical administration of water-soluble contrast is promising in acute adhesive intestinal obstruction, which, in addition to solving diagnostic problems, has a therapeutic effect, allowing to increase the effectiveness of conservative measures to 81.5-91%. Controlled randomized trials conducted by Di Saverio S (2008), Burge J (2005), have proven significantly faster resolution of obstruction compared to placebo in patients with acute adhesive small bowel obstruction
(evidence confidence level 2b).

Comprehensive and thorough control over the course of intestinal obstruction is important, which is carried out on the basis of a set of parameters: 1) clinical data (pain, bloating, stool discharge, gas, vomiting, dynamics of the probe discharge); 2) laboratory parameters indicating the water-electrolyte balance and 3) x-ray assessment of the passage of contrast media (water-soluble drugs, barium sulfate) in the gastrointestinal tract. 1. Signs of unresolved acute small bowel obstruction are: persistence/recurrence of abdominal pain, vomiting, the appearance of muscle tension, free fluid in the abdominal cavity during CT or ultrasound, probe discharge of more than 500 ml/day (level of confidence in the evidence 2c), theabsence of dynamics of the progress of the contrast agent through the small intestine and its entry into the large intestine (level of confidence in the evidence 2)

In this situation, a decision is made on urgent surgical intervention, and the conservative measures carried out are regarded as elements of preoperative preparation.

6.2. Surgical treatment

Surgical tactics for non-tumor obstruction depends primarily on the cause, form of obstruction and its severity. Emergency operations are shown when:
In the case of the strangulation form of acute intestinal obstruction (intussusception, adhesive process, inversion, nodulation), it is recommended to perform emergency surgical treatment.
The level of credibility of recommendation B (the confidence level of evidence 2a)

Comments: The delay of the operation in this situation is unacceptable. The intervention is performed within 2 hours of admission due to the risk of organ necrosis and peritonitis. If the colon is inverted, the disease is short and there are no signs of intestinal necrosis, it is possible to carry out conservative measures aimed at resolving the obstruction (siphon enema, therapeutic colonoscopy)

In the advanced stage of AIO with severe intro-electrolyte disorders, pronounced probe losses (more than 1000 ml), significant dilatation of the small intestine (more than 5 cm) and long periods (more than 36 hours) from the beginning of the disease, it is recommended to perform emergency surgical treatment.

The level of credibility of recommendation B (level of reliability of evidence 2a)

Comments: In this group of patients, emergency surgical intervention is most appropriate, after a full preoperative preparation for 2-4 hours, aimed at correcting metabolic disorders and organ failure.

Attempts to resolve the obstruction in such a situation are ineffective. The volume and time of preoperative preparation is determined in the consultation of the surgeon, anesthesiologist and therapist (as indicated). As a preparation, infusion therapy (crystalloid, colloidal, glycosylated solutions), decompression of the upper gastrointestinal tract (nasogastric probe), symptomatic therapy are used.

Surgical intervention. The choice of the method of surgical intervention (laparoscopy, laparotomy) depends on the cause of the violation of the passage through the intestine, the severity of the adhesive process and obstruction, the condition of the intestine.

In case of acute adhesive small bowel obstruction, it is recommended to perform a minimally invasive intervention-laparoscopic adhesiolysis.

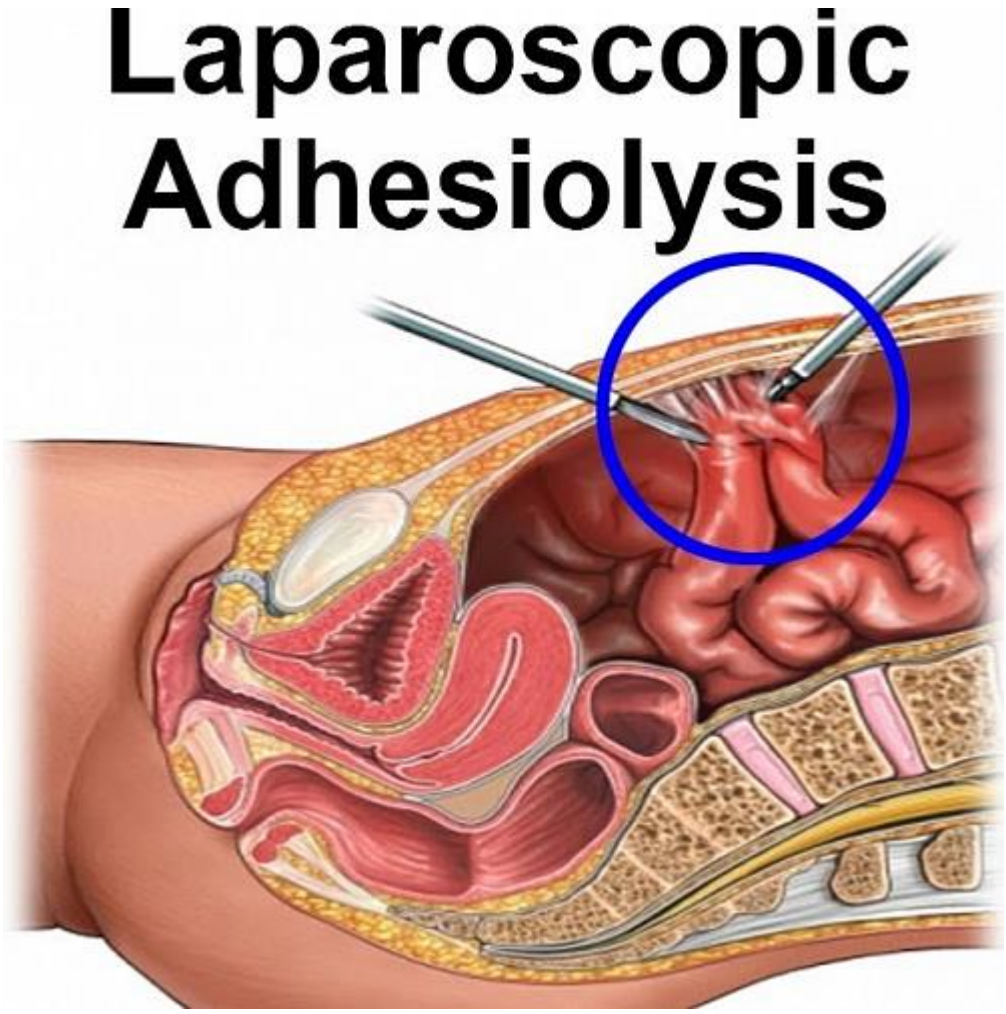

Fig. 6.2.1 Laparoscopic adhesiolysis

Recommendation C credibility level (evidence confidence level 2c) [14-16].

Comments: Laparoscopic intervention is less traumatic, is accompanied by a lower number of postoperative complications and deaths, reduces the risk of adhesions, allows faster rehabilitation of patients. However, the use of laparoscopy for adhesive intestinal obstruction is possible in a limited number of patients. This is due to the high probability of intraoperative damage to the intestine, against the background of the adhesive process in the abdominal cavity and the expansion of the loops of the small intestine, which occurs in 3-17% of patients. At the same time, the method, despite its low invasiveness, has limitations in use due to the risk of damage to the intestine. Contraindications to its implementation are: the presence of more than 3 or more operations in the anamnesis, expansion of the small intestine more than 4 cm, intestinal necrosis or peritonitis.

In some "uncomplicated" situations, when the viability of the intestine is questionable, it is recommended to monitor patients with the performance of "re-look" operations after 12 hours.

Recommendation C credibility level (evidence confidence level 2c)

The risk of laparoscopic access in the case of adhesions in the abdominal cavity and obstruction is high. Therefore, this stage should be performed at the most remote points from the postoperative scars, taking into account the constitutional characteristics of the patient and taking into account the identification of "acoustic windows" according to preoperative ultrasound scanning of visceroparietal abdominal junctions.

Decompression of the gastrointestinal tract

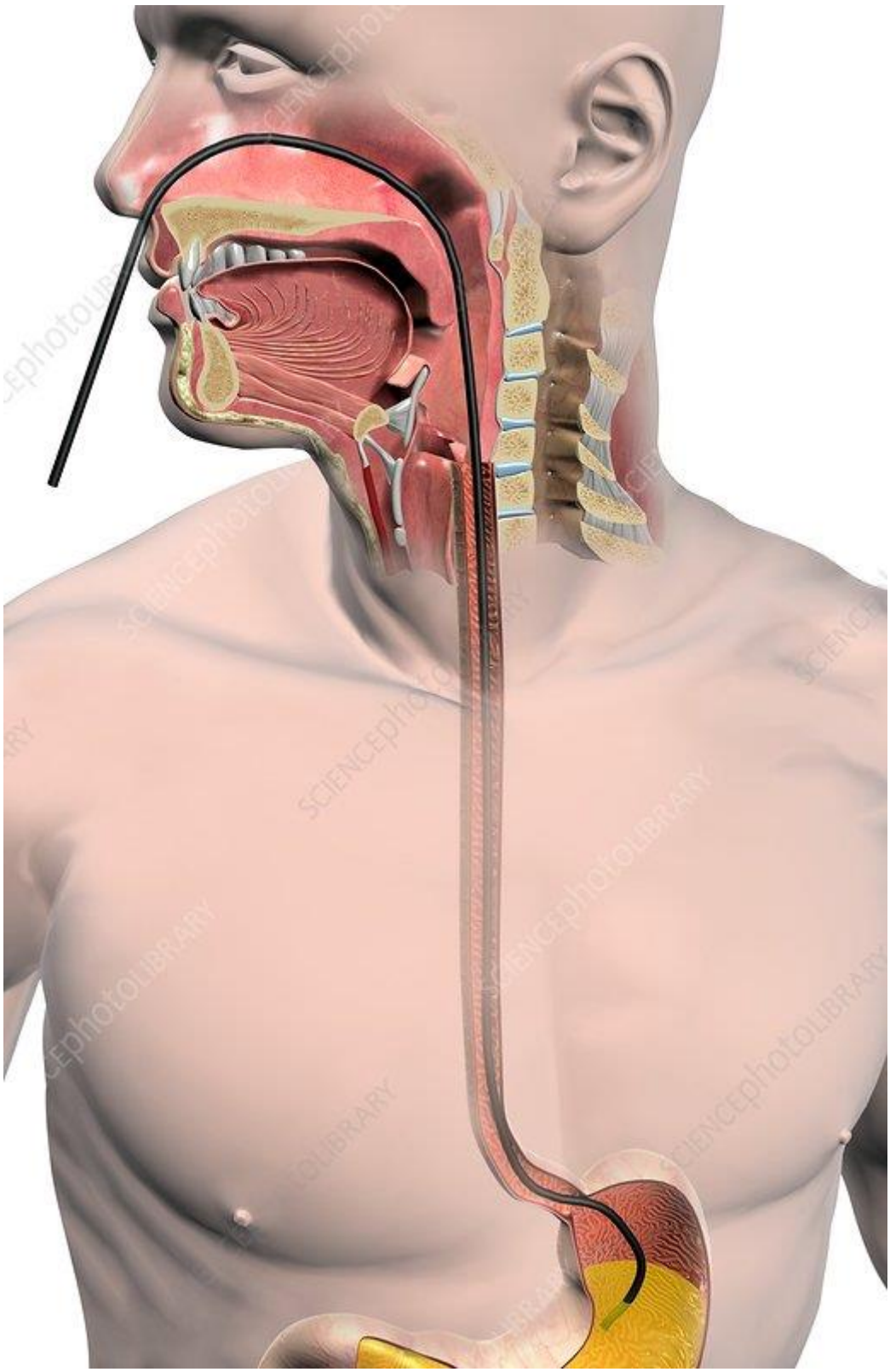

Fig. 6.2.2 Decompression of the gastrointestinal tract

after laparoscopic interventions for AIO is most often performed using a nasogastric probe. However, in situations where intestinal obstruction is pronounced, accompanied by an expansion of the small intestine of more than 40 mm, a large

amount of probe discharge, it is necessary to perform intraoperative intubation of the small intestine with an endoscope for 30-50 cm below the Treitz ligament.

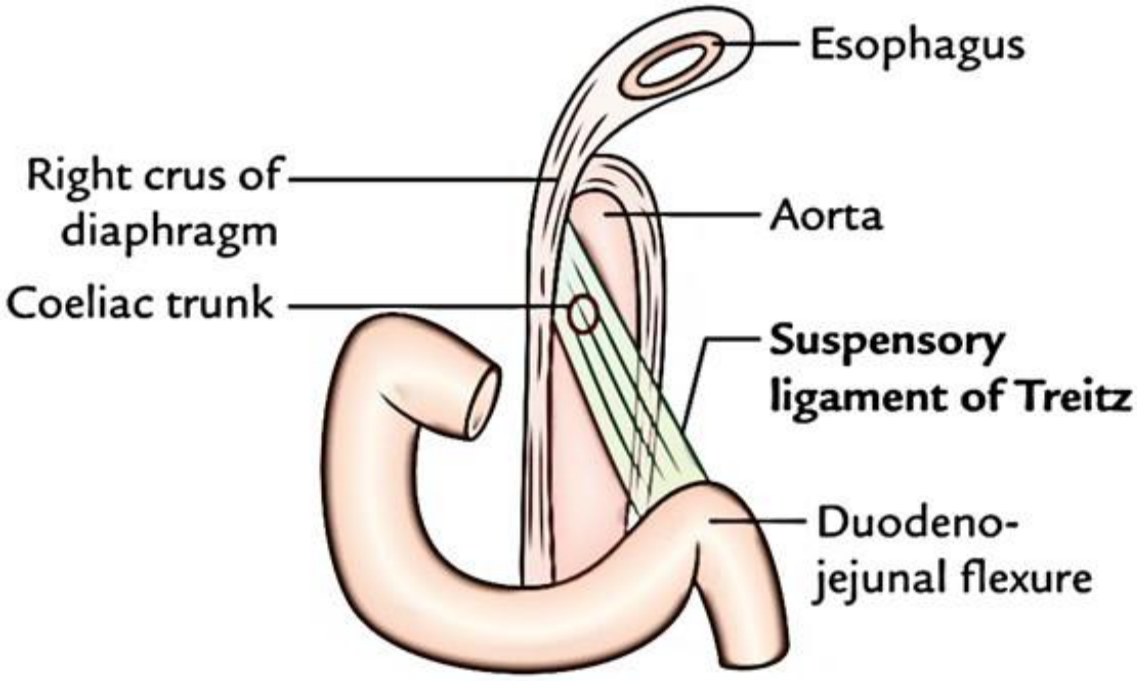

Fig. 6.2.3 Treitz ligament

The completeness of adhesiolysis and the adequacy of laparoscopic resolution of intestinal obstruction must necessarily be confirmed by postoperative contrast enterography. The delay in the arrival of the contrast agent in the large intestine for more than 20 hours indicates a continuing violation of the passage through the small intestine.

In other situations (multiple laparotomies, obstruction unrelated to the adhesive process, pronounced water-electrolyte disorders, strangulation form of AASBO with intestinal necrosis), surgical intervention – laparotomy is indicated.

Stages of the operation:

Revision of the abdominal cavity, identification of the pathomorphological substrate of obstruction. Taking the exudate of the abdominal cavity for bacteriological examination.

Determination of the viability of the intestine in the obstruction area and determination of indications for its resection. When determining the indications for intestinal resection, visual signs (color, peristalsis, pulsation and blood filling of the

parietal vessels) are used, as well as the dynamics of these signs after the introduction of a local anesthetic solution into the mesentery of the intestine and "warming" the intestine with warm wipes moistened with saline. For an objective assessment of blood supply, it is also possible to use laser Doppler flowmetry, regional transilluminationangiotensometry of intrahepatic vessels of the small intestine
(level of reliability of evidence 2)

In some situations, if there are doubts about the viability of the intestine for a long time, it is permissible to postpone the decision on resection using a programmed relaparotomy or laparoscopy after 12 hours.

1. In case of intestinal necrosis, resection is performed within the viable tissues, retreating from the necrosis zone in the adductor section by 30-40 cm, in the adductor section by 15-20 cm. The exceptions are resections near the Treitz ligament or the ileocecal angle, where it is allowed to limit these requirements with favorable visual characteristics of the intestine in the area of the intended intersection. At the same time, control indicators are necessarily used: bleeding from the vessels of the wall at its intersection and the condition of the mucous membrane.

2. Given the presence of a difference in the diameters of the small intestine, it is preferable to apply a small-small intestinal anastomosis "side to side". When resecting the colon, the operation is completed by applying a colostomy. In right-sided hemicolectomy, ileotransverzoanastomosis can be applied.

3. Holding a nasointestinal tube to the intestinal decompression is mandatory, except window without significant dilation of the bowel loops (30 mm), small amounts detachable probe (500 ml), no pronounced adhesions and the need for bowel resection. In such situations, nasogastric decompression is acceptable. In most cases, drainage of the small intestine should be performed within 50-100 cm from the Treitz ligament to two-light probes for decompression and enetrotherapy in the postoperative period. Total intubation of the small intestine due to its high trauma is recommended only in cases of pronounced adhesive process, to ensure the skeletal function, or multiple iatrogenic injuries of the intestinal wall for more adequate decompression. If it is impossible to conduct a probe into the small intestine, due to a

pronounced adhesive process in the upper floor of the abdominal cavity, an intraoperative endoscopic guide is used to install nasoejunal drainage. Open decompression of the small intestine by enterotomy should be avoided due to the risk of infection of the abdominal cavity.

4. In cases where AIO is complicated by widespread peritonitis and high intra-abdominal pressure due to pronounced expansion of the small intestine, to prevent the development of compartment syndrome, the laparotomic wound should be sutured using one of the decompression methods.

Additional information that affects the course and outcome of the disease Features of the treatment of AIO for other causes of the disease.

In case of gallstone obstruction, enterotomy is performed with the extraction of the stone. Enterotomy should be performed on an area of the intestine that does not have pronounced trophic changes in the walls-preferably distal to the obstacle. Incision and suturing enterotomy wounds should be carried out in the transverse direction. It is necessary to refrain from crushing and lowering gallstones into the caecum due to the traumatic nature of the manipulation. The separation of the conglomerate and simultaneous interventions on the gallbladder and the area of the bile-intestinal fistula are not recommended.

When obturating bezoars, they are fragmented and relegated to the cecum. If it is not possible, enterotomy with the extraction of these formations.

In the case of sigmoid colon inversions without necrosis, the following is produced: 1) Mikulich-type resection (in the absence of high operational risk in preserved patients) 2) detorsion of the inversion with mesosigmoplasty and retrograde intubation of the sigmoid colon with a gas outlet tube. 3) When the sigmoid colon turns with necrosis, a Hartmann-type resection

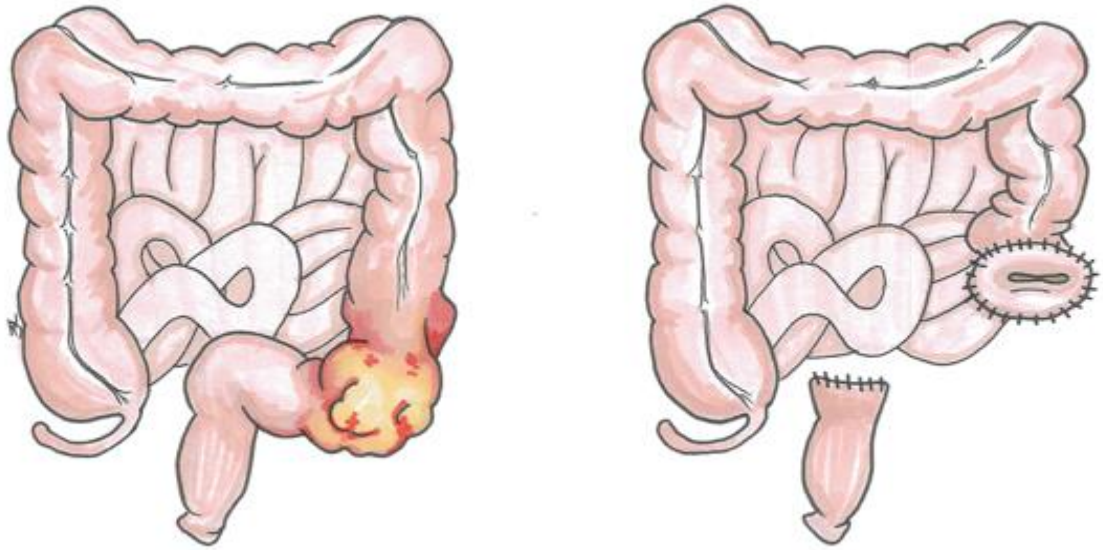

Fig. 6.2.4 Hartmann's Repair

is performed with the removal of a single-barrel sigmostoma.

When inversions of the cecum without necrosis: 1) resection of the intestine with anastomosis; 2) detorsion of the inversion and cecopexy. With necrosis of the cecum: 3) resection with ileotransverzoanastomosis; 4) with severe obstruction, peritonitis, resection with ileo - or transversostomy

In cases of inversion of the transverse colon, regardless of the presence or absence of necrosis: segmental resection of the transverse colon or expanded hemicolectomy with the removal of a colostomy. In right-sided hemicolectomy, an ileotransverzoanastomosis may be applied. When the small intestine is inverted without necrosis, detorsion of the inversion, plication of the mesentery of the small intestine on a long nasointestinal probe is performed. In case of inversion with necrosis of the small intestine, resection of the small intestine is performed with the imposition of a side-to-side anastomosis, nasointestinal decompression.

In the case of intestinal nodulation, the node is straightened in exceptional cases – a short period of time from the onset of the disease (up to 4 hours) and the apparent viability of the organ. Otherwise, the expansion of the node is dangerous by resorption and the development of pronounced endotoxicosis and is accompanied by

a higher lethality than after resection of the conglomerate. In this regard, in the vast majority of cases, intestinal resection is performed.

Treatment of intestinal intussusception in adults is only surgical. First, disinvagination is performed. It consists in carefully pushing the invaginate head in the proximal direction. It is unacceptable to pull out the invaded part of the intestine. The viability is evaluated and the question of resection of the intestine is decided. If a disinvagination attempt is unsuccessful, necrosis or an organic cause of intussusception is present, a bowel resection is performed.

In acute adhesive small bowel obstruction and the presence of difficult-to-separate adhesive conglomerates, the separation of which is impossible without damage to the intestine, the use of shunt interstitial anastomoses, or limited resections of the entire conglomerate without manipulations on the altered intestine is indicated.

If possible progressive destructive changes in the intestinal wall are suspected, its resection should be performed without applying anastomoses. The subsequent "re-look" operation, performed after 12 hours, will allow you to more accurately determine the need and boundaries of resection of the small intestine and restore the continuity of the gastrointestinal tract.

In extreme cases, with widespread peritonitis and the need for high resection of the small intestine, it is possible to refuse to apply the primary anastomosis. In such a situation, it is justified to temporarily remove the double-stemmed jeunostomy and drain its proximal and distal segments to ensure reinfusion of intestinal contents and enteral nutrition in the postoperative period.

7. Postoperative period.

Intestinal obstruction triggers a cascade of diverse pathological processes affecting all organs and systems, but the small intestine itself is at the center of events, being the primary and main source of endogenous intoxication. Severe homeostatic disorders and morphological changes in the small intestine persist even after successful surgical resolution of the obstruction, which is the cause of

postoperative complications. These circumstances justify the need for intensive postoperative therapy, the main components of which include the following measures:

-Peridural anesthesia for the purpose of adequate anesthesia;

-Infusion therapy for the correction of metabolic disorders (colloidal, crystalloid, glycosylated, protein solutions);

-Parenteral nutrition (from the second day of the postoperative period until the transition to independent oral or full enteral nutrition);

-Antibiotic therapy with broad-spectrum drugs (Cephalosporins of the 3rd generation, fluoroquinolones, metranidazole, carbapenems), the administration of which lasts up to 7-9 days of the postoperative period;

-In patients with initially severe obstruction, enterotherapy is performed through an established nasointestinal two-light probe. The objectives of this treatment include: detoxification, early restoration of small bowel function, and nutritional support. This reduces the incidence of postoperative complications and provides early rehabilitation of patients

(evidence confidence level 2c).

The main stages of enterotherapy are: decompression of the small intestine, its lavage with glucose-electrolyte solutions (from 2 days), the introduction of oligopeptide agents from 3 days of the postoperative period, in order to gradually restore the functions of the small intestine and subsequently the introduction of polysubstrate nutrient mixtures;

-Symptomatic therapy;

An important point of postoperative management of patients with AIO is careful monitoring of the condition for the purpose of early diagnosis of postoperative surgical complications. To do this, along with an assessment of the clinical situation required to conduct daily laboratory monitoring (general analysis of blood acid-base balance, blood chemistry, electrolytes blood) and the control abdominal ultrasound including Doppler intravascular vessels of the small intestine to assess the condition of the small intestine (its diameter, peristalsis, wall thickness,

blood flow) and the presence of effusion in the abdominal cavity. The dynamics of recovery of small bowel function should be evaluated according to the following indicators

(the level of reliability of the evidence is 2c):

-Clinical:

appearance of active peristalsis;

the appearance of a chair, the departure of gases;

reducing the amount of probe discharge - up to 400 ml/day;

2. Data of ultrasonic examination:

- the appearance of peristaltic waves;
- reducing the diameter of the small intestine to 20-25 mm;
- resolution of edema of the small intestine wall and reduction of its thickness to 3 mm;
- normalization of intra-hepatic blood flow of the small intestine, and a decrease in the index of perephyric resistance to 0.63 cm / s

With persistent paresis, along with enterotherapy, the motor function of the gastrointestinal tract is stimulated (proserin, cerucal, serotonin). If conservative therapy of gastrointestinal paresis is ineffective for 24-48 hours, the question of revision of the abdominal cavity (laparoscopy, relaparotomy) is raised due to the possible development of intra-abdominal complications.

8. Rehabilitation

After the elimination of intestinal obstruction and correction of metabolic disorders, it is recommended to activate the patient as early as possible and switch to a full diet. This usually occurs by 6-8 days after "open" and 4-7 days after laparoscopic operations.

After the patient's discharge, it is recommended to limit physical activity for 2-3 months after laparotomy and for 1 month after laparoscopic intervention.

Patients with adhesive intestinal obstruction, which resolved conservatively, are recommended a fractional 4-5 meals a day with a restriction of simultaneous intake of a large number of products containing coarse fiber (nuts, persimmons, sauerkraut, radishes, etc.)

9. Control questions

1. Classification of acute intestinal obstruction
2. Etiopathogenesis of acute intestinal obstruction
3. Clinical picture of acute intestinal obstruction
4. Diagnostic algorithm of examination of patients with acute intestinal obstruction;
5. Principles of conservative treatment of patients with acute intestinal obstruction.
6. Indications for surgical treatment of patients with acute intestinal obstruction.
7. Preoperative preparation of patients with acute intestinal obstruction.
8. Basic principles of surgical treatment of patients with acute intestinal obstruction
9. Management of the postoperative period and rehabilitation of patients with acute intestinal obstruction.

10. Tests

1. The most common intestinal obstruction (IO): Response options:

a) tumor intestinal obstruction;

b) paralytic intestinal obstruction;

c) adhesive intestinal obstruction;

d) gallstone intestinal obstruction;

e) nodulation.

2. In the pathogenesis of paralytic IO, the leading role is assigned to: Possible answers:

a) infringement of the mesentery vessels;

b) intestinal stasis;

c) decrease in the functional state of the APUD system;

d) activation of the microbial factor;

e) violations of the water-electrolyte balance.

3. The most common clinical symptom of IO is: Response options:

a) vomiting;

b) pain;

c) bloating;

d) stool retention;

e) gas retention.

4. Obturation parasitic IO most often develops when: Variants of the answer:

a) the enterobiasis;

b) echinococcosis;

c) opisthorchiasis;

d) schistosomiasis;

e) ascariasis.

5. In the treatment of paralytic intestinal obstruction, perform: 1) decompression of the gastrointestinal tract; 2) paranephralnovocaine blockade by Vishnevsky; 3) injections of proserin and aminazine; 4) electrostimulation of the intestine, massage, acupuncture: Response options:

a) 1, 2, 3;

b) 1, 3;

c) 2, 4;

d) 1, 2, 3, 4;

e) 3.

6. Intestinal obstruction is mainly observed in: Response options:

a) men of working age;

b) women of working age;

c) children;

d) elderly people;

e) pregnant women.

7. The action of the aldosterone mechanism in IO leads to: Response options:

a) an increase in the excretion of Na and Cl, the loss of K progresses;

b) a decrease in the excretion of Na and Cl, the loss of K progresses;

c) decrease in the excretion of Na and Cl, the loss of K decreases;

d) decrease in the excretion of Na and Cl, the loss of K does not change;

e) an increase in the excretion of Na and Cl, the loss of K does not change;

8. The presence of cramping pains in the abdominal cavity, periodically stopping for 2-3 minutes, is characteristic of: Response options:

a) paralytic IO;

b) spastic IO;

c) obturation IO;

d) strangulation IO;

e) ileocecal invagination.

9. The development of gallstone IO is possible: Response options:

a) in all patients with gallstone disease;

b) in the presence of concretions up to 5 mm in diameter;

C) there are cholecysto-choledochal fistula;

d) in the presence of a cholecysto-duodenal fistula;

e) in the presence of a choledocho-duodenal fistula.

10. With the established diagnosis of "sigmoid colon inversion", it is shown: Response

options:

a) drug stimulation of the intestine;

b) hyperbaric oxygenation;

c) decorsia, matchmobile;

d) planned surgical treatment;

e) right-sided hemicolectomy in an emergency.

11. Obstruction on the basis of invagination is more common in: Answer options:

a) men of working age;

b) women of working age;

c) children;

d) elderly people;

e) pregnant women.

12. The cause of intoxication in IO is: 1) production of endotoxins; 2) accumulation of products of incomplete hydrolysis of proteins; 3) sampling of exotoxins; 4) necrotic tissues. Answer options:

a) 1, 3;

b) 2, 4;

c) 1, 2, 3;

d) 1, 2, 3, 4;

e) 4.

13. Resembling persistent spastic pain in the pear cavity, characteristic of: Variants answer:

a) paralytic IO;

b) spastic IO;

c) obturation IO;

d) the wandering book;

d) ileocecal invagination.

14. If the intestine is not viable, it is resected from the place of obstruction approximately in the subsequent volume: Options answer:

a) resect at least 30-40 cm of the leading segment of the intestine;

b) remove 10-15 cm of the leading segment of the intestine;

c) resect 10-15 cm of the diverting and leading segment of the intestine;

d) resect 30-40 cm of the diverting segment of the intestine;

d) remove 30 cm of the diverting and 30 cm of the leading segment of the intestine.

15. In the pathogenesis of wandering IO, the leading role is assigned to: Variants of the answer:

a) infringement of the mesentery vessels;

b) the rainforest;

c) decrease in the functional state of the APUD system;

d) activation of the microbial factor;

e) violations of the water-electrolyte balance.

16. Uniform bloating of life in combination with severe bursting pain and persistent retention of stool and gases is characteristic of: Variants of the response:

a) paralytic IO;

b) spastic IO;

c) obturation IO;

d) wandering IO;

e) ileocecal invagination.

17. The mechanisms of anti-infectious protection of the gastrointestinal tract include:

1) secretory activity of the intestine; 2) acidic environment in the proximal gastrointestinal tract; 3) motor function; 4) immune mechanism - production of IgA: Options answer:

a) 1, 3;

b) 1, 2, 3;

c) 2, 4;

d) 1, 2, 3, 4;

e) 4.

18. Imaat of a nagging bursting character are found in: Answer options:

a) paralytic IO;

b) spastic IO;

c) the obstructive IO;

d) strangulation IO;

e) the ileocecal intussusception.

19. With the open method of decompression of the gastrointestinal tract include: 1) nasogastroenteral drainage; and 2) suspended ileostomy; and 3) transanal drainage; and 4) unnatural anus. Variants of the answer:

(a) 1, 3;

(b) 2, 4;

(c) 1, 2, 3;

(d) 1, 2, 3, 4;

(e) 4.

20. In ileocecal intussusception in children, the most acceptable: Response options:

a) surgical treatment;

b) dynamic observation;

c) administration of high doses of antispasmodics;

d) pneumatic disinfection under ultrasonic control;

e) barium enema.

21. According to the degree of violation of intestinal patency, there are:

1) complete; and 2) small bowel; and 3) partial; 4) large bowel obstruction:Variants of the answer:

a) 1, 2, 3;

b) 2, 4;

c) 1, 3;

d) 1, 2, 3, 4;

e) 2, 3, and 4.

22. Pathological changes due to hypoxia are most pronounced in: Response options:

a) the submucosal layer of the intestine;

b) serous membrane;

c) the mucous membrane;

d) the muscle membrane;

e) the adjacent parietal peritoneum.

23. The rapid shock-like appearance of pain is characteristic of: Response options:

a) paralytic IO;

b) spastic IO;

c) obturation IO;

d) strangulation IO;

e) ileocecal intussusception.

24. Closed methods of decompression of the gastrointestinal tract include: 1) nasogastroenteral drainage; 2) suspended ileostomy; 3) transanal drainage; 4) unnatural anus: Response options:

a) 1, 3;

b) 2, 4;

c) 1, 2, 3;

d) 1, 2, 3, 4;

e) 4.

25. In the surgical treatment of adhesive IO, the following options are most often performed:

a) parietal intestinoplication;

b) transmesothelial intestinally;

c) mesostigmatic;

d) cecopexy;

e) dissection of adhesions.

26. According to the level of intestinal obstruction, there are: 1) complete; 2) small bowel; 3) partial; 4) large bowel obstruction: Response options:

a) 1, 2, 3;

b) 2, 4;

c) 1, 3;

d) 1, 2, 3, 4;

e) 2, 3, 4.

27. The most pronounced pathomorphological changes in mechanical IO: Responseoptions:

a) the diverting loop of the intestine;

b) the adductor loop of the intestine;

c) large oil seal;

d) parietal peritoneum;

e) visceral peritoneum.

28. Vomiting with IO: 1) it occurs in 70 % of patients; 2) it is initially reflex in nature; 3) the higher the obstruction, the higher it is more pronounced; 4) in the late period, indomitable with a fecal odor: Response options:

a) 1, 3;

b) 2, 4;

c) 1, 2, 3;

d) 4;

e) 1, 2, 3, 4.

29. Paralytic intestinal obstruction may be caused by: 1) retroperitoneal hematoma; 2) toxic effect on neuroregulatory centers; 3) uremia; 4) inflammatory process in the abdominal cavity: Response options:

a) 1, 3;

b) 2, 4;

c) 1, 2, 3;

d) 1, 2, 3, 4;

e) 4.

30. Most often, according to the mechanism of development, there are: Response options:

a) paralytic intestinal obstruction;

b) spastic intestinal obstruction;

c) obstructive intestinal obstruction;

d) strangulation intestinal obstruction;

e) mixed intestinal obstruction.

Test answers

№question	Correct answer	№ question	Correct answer
1	c	16	a

2	b	17	d
3	b	18	a
4	b	19	b
5	d	20	d
6	a	21	c
7	b	22	c
8	c	23	d
9	d	24	a
10	c	25	e
11	c	26	b
12	d	27	b
13	d	28	e
14	a	29	d
15	a	30	e

11. Situational tasks

Task 1. A 42-year-old patient was admitted to a surgical clinic with complaints of cramping pains in the abdominal cavity, nausea, vomiting. Sick for 6 hours. In the anamnesis-2 operations of cesarean section. Sometimes, during meals, I noticed the appearance of pain in the abdominal cavity. A preliminary diagnosis? Survey plan?

Task 2. A 63-year-old patient underwent surgery for cancer of the transverse colon – a resection of a part of the transverse colon was performed. On the 10th day after the operation, the patient developed vomiting, stoolage and gas retention, and splashing noise in the abdominal cavity. The pain syndrome is not pronounced. Your diagnosis? Survey plan? Therapeutic tactics

Task 3. A patient, 35 years old, has been suffering from Crohn's disease for a long time. Against the background of aching pains in the epigastrium, cramping pains

appeared throughout the abdominal cavity, repeated vomiting, nausea, gases do not leave, there was a single liquid stool. During hospitalization: the abdomen is swollen evenly, soft, painful with palpation in the mesogastrium, with a finger rectal examination of the pathology was not revealed. Your preliminary diagnosis? Survey plan? Treatment?

Task 4. A patient, 72 years old, was admitted to a surgical clinic with complaints of cramping pains in the abdominal cavity, nausea, vomiting,stool retention and gas. From the anamnesis, it was found out that the patient for about 1 year was periodically disturbed by abdominal pain, constipation, and several times noted the appearance of black stools. On examination: general condition of moderate severity, low nutrition, abdomen swollen, soft, painful on palpation along the ascending colon, where a lumpy, moderately painful formation about 10 cm in diameter is palpated. No rectal pathology was detected. On the survey radiograph of the abdomen revealed multiple air fluid levels with the accumulation of gas over them. Your diagnosis? What are your therapeutic measures?

Task 5. A patient, 62 years old, was admitted to a surgical clinic with complaints of abdominal pain, vomiting,delayed stool and gas. Suddenly, 3 hours ago, for no apparent reason, the patient had cramping pains in the abdomen, which were of a diffuse nature, gradually increased and did not completely stop after the cramping attack. The vomiting was repeated, with nausea, belching in between. Upon admission, the patient's condition is severe. He is pale, his skin is covered with cold sweat, and his features are sharpened. Pulse — 60 beats / min, rhythmic, weak filling. Blood pressure-110/70 mm Hg. the tongue is dry, the abdomen is unevenly swollen, and peristalsis is visible. Symptoms of peritoneal irritation and tension of the anterior abdominal wall are absent. A positive symptom of Sklyarov. Auscultatory determined noise peristaltica intestine. Your diagnosis? Survey plan? Treatment?

Task 6. A patient, 28 years old, was admitted to the clinic with complaints of intense pain localized in the right half of the abdomen, nausea,delayed stool and gas. Got sick about 16 hours ago. Suddenly there were cramping pains in the right half of the abdomen; there was an independent stool after the enema. In the future, the pain

began to increase, nausea appeared. There was no vomiting. The condition of the patient is of moderate severity. Heart rate — 80 beats/min. Blood pressure — 120/60 mm Hg.The tongue is clean, moist. The abdomen is asymmetrical, swollen. The Valya symptom is determined. On palpation, the abdomen is soft, moderately painful in the right lateral region, loud peristaltic noises are heard during auscultation. Symptoms of Sumanadasaand Spasokukotskogo positive. X-ray examination reveals a swollen cecum. Your preliminary diagnosis? What are your tactics?

Task 7. A patient, 67 years old, was admitted to the surgical department with complaints of sharp cramping pains in the abdomen, lack of stool and gas. I got sick 4 days ago, when there were cramping pains in the left half of the abdomen, there was a single vomiting. All this time there was a delay of stool and gases. The patient's condition is satisfactory. Restless only at the time of cramping pains. Pulse-80 bpm, blood pressure-140/80 mm Hg, tongue moist, overlaid. The abdomen is swollen, huge, and asymmetrical. Sonorous percussion is defined tympanitis. On palpation, the abdominal wall is painless, with the exception of the left lateral and left inguinal areas, where there is local muscle protection and moderate soreness. Auscultation listen various intestinal noises. The symptom of the Obukhov hospital is positive. Radiologically, a symptom of a "giant hairpin" with fluid levels in both knees of the intestine. Your diagnosis? Survey plan? Treatment?

Task 8. A patient, 36 years old, was admitted to a surgical clinic with complaints of constant abdominal pain, repeated vomiting with a fecal odor, delayed stool and gases. I got sick 26 hours ago, when I had cramping pains all over my stomach. The first 12 hours of pain were pronounced cramping, then became more permanent. Vomiting for the last 10 hours became continuous. There was no chair. The gases do not escape. The patient is pale, his face is haggard, he is tossing and turning all the time. The skin is dry. Pulse — 120 beats / min, rhythmic, weak filling. Blood pressure — 90/60 mm Hg. The tongue is dry, covered with a white coating. The abdomen is strongly swollen and asymmetrical. A positive symptom of Val. Peristaltic noises are not constantly detected. Radiologically, the arcades and arches

of the swollen intestines, as well as the Cloiber bowls, are determined. Your diagnosis? What stage of the disease should I think about? The treatment plan?

Task 9. A patient, 24 years old, was taken to the clinic in a serious condition with complaints of sharp cramping pains throughout the abdomen, repeated vomiting. 2 hours ago, there were cramping pains that increased intensively and did not completely subside outside of the cramping attack. Pale, covered with cold sweat, pulse-70 beats / min, rhythmic satisfactory filling. Blood pressure — 100/60 mm Hg. The tongue is clean and moist. The abdomen is not swollen. During a painful attack, peristalsis is visible. Peristaltic noises can be heard from a distance. There are no symptoms of peritoneal irritation. Radiologically, a gas bubble in the small intestine is detected, there are no levels. Your diagnosis? What stage of the disease can you think about? The treatment plan?

Task 10. A patient, 57 years old, was admitted to a surgical hospital with complaints of vomiting with a fecal odor, lack of stool. I got sick two days ago, when I had cramping pains in my stomach and repeated vomiting. The pain for the specified period changed its nature: by the end of the first day they became permanent, and by the end of the second day they stopped altogether. Vomiting has become less frequent, but in the last 10 hours it has acquired a fecal smell. Urination is rare and in small portions. The patient's condition is extremely serious. Pale, the face of Hippocrates. Pulse — 130 beats/min, arrhythmic filamentous. Blood pressure — 80/40 mm Hg. The tongue is dry, cracked, and covered with a dirty coating. The abdomen is swollen, there is a slight tension of the anterior abdominal wall. A positive symptom of Shchetkin-Blumberg. Peristalsis is not tapped. Percussion in the abdominal cavity is determined by the free effusion. Leukocytosis 12.5×10 with the formula shifted to the left. Your diagnosis? What additional research needs to be done? What stage of the disease should you think about? Treatment?

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