MINISTRY OF HEALTHCARE OF UKRAINE
"Ukrainian Medical Stomatological Academy"

Educational lectures for foreign students

Educational discipline	Surgery, including pediatric surgery
Module №2	Pediatric surgery
Theme of the lesson	**Inflammatory diseases of abdominal cavity organs. Acquired intestinal obstruction.**
Course	5
Faculty	International faculty

POLTAVA - 2021

The number of teaching hours 2

1. Scientific - methodical substantiation topics

The mortality of this disease has progressively declined; on the other hand, the percentage of children hospitalized with a ruptured appendix and localized or generalized peritonitis has not changed significantly. Further reduction in the morbidity from appendicitis can be accomplished only by earlier recognition and treatment of the disease, before the inflamed appendix ruptures. The topic is very important for future doctors in their professional activity, positively influences the students in their attitude to the future profession, forms professional skills and experience as well as taking as a principle the knowledge of the subject learnt.

2 Educational lectures aim.

1. To master the basic list of surgical diseases at children caused by the inflammatory diseases of abdominal cavity organs.
2. To recognize basic clinical manifestation and local symptoms of inflammation of abdominal cavity organs.
3. To differentiate symptoms of inflammatory diseases of abdominal cavity organs, which need surgical intervention.
4. To master the list of diseases which cause the acquired intestinal obstruction.
5. To recognize the basic clinical manifestation of all types of the acquired intestinal obstruction.
6. To define the main reasons of the origin of intestinal intussusception, commissural ileus, obturative and dynamic ileus.
7. To carry out differential diagnostics of the acquired intestinal obstruction based on its origin, duration of the disease. Distinguish intestinal obstruction from the different somatic and surgical diseases which cause an abdominal syndrome.
8. To generalize basic principles of treatment of diseases which are accompanied by the acquired intestinal obstruction and to define an indications for conservative and operative methods of treatment.

3. Development of personality of future specialist (educational aims), relevant aspects of:

1. In the process of lighting themes to promote further development of analytical and logical thinking in students, to deepen the logical connection between the children's surgery as a discipline and the clinics of Pediatrics and surgery, noting the peculiarities of surgical diseases in pediatric surgery.
2. To educate responsibility for the timeliness and accuracy of medical action.
3. To be able to set psychological contact with the parents of a sick child.
4. Carefully adhere to the principles of medical ethics and deontology.

4. Interdisciplinary integration.

Names of previous disciplines	Obtained skills
1. Anatomy, topographic anatomy.	Conducting palpation of different parts of the intestine, knowledge of the features of the anatomy of the abdominal cavity in different age periods.
2. Pathological physiology.	Clinical interpretation of laboratory studies.
3. Pathological anatomy.	Compare the morphological changes inherent in different types of acute appendicitis, peritonitis.

4. Microbiology.	Own the technique of sampling material for research. Interpret the results of the microbiological study.
5. Propaedeutics of childhood diseases	Collect complaints, anamnesis of the disease, conduct an examination of the child and additional methods of examination for diseases of the abdominal cavity.
6. Topographic anatomy and surgical surgery.	Own the methodology (diagrams) of operational access and methods of surgical interventions on the organs of the abdominal cavity in children of different age groups.
7. Radiology	Interpretation of X-ray examination data.

5. Plan and organization. Structure lectures

The main stages of lectures and their contents.	Type lecture. Means revitalization students. Materials methodological support.	Time
1.The preparatory stage. Determining the relevance of the theme: educational purposes lectures and motivation		5%
2. The main stage		
Submission of lecture material on the plan 1.Surgical diseases at children caused by the inflammatory diseases of abdominal cavity organs 2. Clinical manifestations and local symptoms of inflammatory diseases of abdominal cavity organs. 3. Clinical manifestations and local symptoms of the inflammatory diseases of abdominal cavity organs in new-born ones. 4. The clinic of acute appendicitis at children of early age (under 3). 5. Classification of the acquired intestinal obstruction at children. 6. The main reasons of origin of intestinal intussusception, commissural ileus, obturative and dynamic ileus. 7.The basic symptoms of intestinal intussusception. 8.The main methods of diagnostics and treatment of intestinal intussusception	Overview summarizing the lecture.	85%-90%
3. Concluding Stage Summary Lectures, Sharing conclusions.	Training literature. Tasks questions.	5%

6. The content of the lecture material.

APPENDICITIS

Appendicitis, rare in the first year of life, has been noted in early infancy. The incidence increases after the first year of life; most cases occur in the first three decades. Males are slightly more prone to appendicitis than females. The mortality of this disease has progressively declined; on the other hand, the percentage of children hospitalized with a ruptured appendix and localized or generalized peritonitis has not changed significantly. Further reduction in the morbidity from appendicitis can be accomplished only by earlier recognition and treatment of the disease, before the inflamed appendix ruptures.

ETIOLOGY. Obstruction is the primary factor in the pathogenesis of appendicitis. The obstruction may be secondary to inflammatory changes from blood-borne or enteric infections or may be mechanical, as by pinworms, a fecalith, other foreign body, stenosis or kinking. Soft fecal material is commonly found in the lumen of the appendix, but has doubtful pathologic significance. In some instances appendicitis appears to be related to an infection of the upper respiratory tract, but a significant correlation is not established. Such systemic infections as rheumatic fever, measles, scarlet fever and other exanthems are infrequently responsible for appendicitis.

Peritonitis or appendiceal abscess eventually occurs from perforation of the inflamed appendix. Coliform organisms predominate in cultures, but a mixed flora is usually responsible for the infection. Recent improvements in microbiologic techniques have identified anaerobic organisms as major contributors to appendiceal infections.

PATHOLOGY. Inflammation begins in the mucosa, which may ulcerate; the wall is edematous and infiltrated with neutrophils; the lumen is distended, often enough to impair the blood supply and produce gangrene and perforation. In milder types there may be mucosal ulceration without obstruction. Bacteria may escape through a perforation or the intact gangrenous wall to produce diffuse peritonitis or an abscess confined by adherence of adjacent omentum and intestines.

CLINICAL MANIFESTATIONS. Epigastric pain shifting to the right lower quadrant and accompanied or followed by nausea, vomiting and low-grade fever is the classic pattern of acute appendicitis. It is the one observed commonly in older children, but relatively infrequently in infants and young children. About 70 per cent of children 5 years of age or younger who have acute appendicitis have a perforation of the appendix and peritonitis when first seen medically. The prodromal manifestations are usually not appreciated in the very young; perforation of the appendix takes place relatively quickly in the thin-walled appendix, and the omentum is not sufficiently developed to afford adequate protection against diffuse peritoneal spread.

Most children 4 years of age and under have difficulty in localizing pain; a finger pointed at the umbilicus or the mother's description of the positions of preference taken by the child, such as knees drawn up or reluctance to move the legs, is as much aid in localization as one may get. When perforation of the appendix has occurred in the very young child, he appears acutely ill with grunting respirations, a rigid abdomen, flaring of the alae nasi, an ashen color and an anxious expression. Extreme prostration may be preceded by an unaccustomed period of inactivity. Fever prior to rupture of the appendix may be absent or of low grade. After development of peritonitis the temperature is usually elevated to 39.5° C or more (103 to 105° F). Subnormal temperature in a prostrated child has serious implications. Active peristalsis may persist for some time with generalized peritonitis.

The initial symptom in the older child is pain, usually persistent rather than intermittent, which increases progressively in severity. With localized ileus, secondary to appendiceal inflammation, the pain may be intermittent or crampy. The amount of vomiting appears to be somewhat related to the position of the appendix; if the organ is retrocecal or deep in the pelvis, no vomiting may occur. Peritoneal irritation and pain may also be masked by the position of the appendix. Constipation is more common than diarrhea, though a pelvic appendix irritating the bowel in the cul-de-sac may produce mucus and diarrhea. Frequency of urination may be produced by an inflamed appendix adjacent to the bladder.

DIAGNOSIS. Persistent pain in the abdomen, insidious or abrupt in onset, accompanied by *persistent* localized tenderness in the right lower quadrant, involuntary muscular spasm and rigidity are evidence of localized intraperitoneal irritation. Nausea and vomiting are frequently present, and low-grade fever is more characteristic than chills and high fever at the onset of the disease. The distinction between voluntary and involuntary muscle spasm or guarding is important. When the frightened young child tenses his abdominal muscles at the sight of a white coat or the touch of a large, cold hand, the abdominal examination becomes unreliable. A gentle, unhurried approach gains the confidence of the child, and

involves time well spent. In some cases, sedation with a short-acting barbiturate will allay apprehension and eliminate voluntary muscle guarding. Narcotic analgesics should not be given since they may mask signs of intraperitoneal inflammation.

Other signs of peritoneal irritation such as cough and rebound tenderness are helpful when elicited. An inflamed retrocecal appendix, however, may have deep tenderness as the only physical finding, and, when the appendix is in the pelvic area, there may be no abdominal findings. The rectal examination should be the final step in the physical examination, but must never be omitted, since it may provide valuable information.

Peristalsis is generally decreased or absent in the presence of intraperitoneal infection, but it may be hyperactive during the early stages. A positive psoas sign, or the tendency of the patient in bed to draw his legs up, is also suggestive of a right lower quadrant inflammatory lesion.

There is usually a mild leukocytosis of 14,000 to 16,000 cells per mm^3 with a preponderance of immature polymorphonuclear cells. Excessively high total leukocyte counts are suggestive of an abscess or peritonitis. Leukopenia associated with prostration and a shocklike state may indicate overwhelming sepsis.

Differential Diagnosis. A history of antecedent or concomitant respiratory or enteric disease, poorly localized pain, fever out of proportion to the abdominal findings or variations in the intensity of pain may suggest *mesenteric adenitis,* but an exact differential diagnosis can be made only by laparotomy.

Prolonged, severe *constipation* may also simulate an acute surgical condition of the abdomen. When feces are easily palpated, and one has reason to suspect fecal obstruction of the bowel, a saline enema of moderate amount may be given. In contrast to the valid objections to catharsis under such a situation, an enema judiciously given may be valuable diagnostically.

Infection of the urinary tract may mimic appendicitis. Urinalysis is indispensable in evaluation of abdominal pain. The urinalysis may be within normal limits, however, in the presence of completely obstructed hydronephrosis. On occasion an intravenous pyelogram may be required for differential diagnosis.

Pneumonia, especially of the right lower lobe, may simulate appendicitis. Abdominal tenderness and muscular tightness are apt to be somewhat higher with the pulmonary infection than with appendicitis. A roentgenogram of the chest will usually clarify the diagnostic situation.

The abdominal pain of *acute gastroenteritis* may on occasion suggest the possibility of appendicitis. Persistent *diarrhea* is rare as a symptom of appendicitis, though several loose stools may herald the onset of disease. If diarrhea persists after an acute abdominal episode, the possibility of a *pelvic abscess* should be considered. The differential diagnosis depends mainly on the physical findings. The two conditions may occur concomitantly.

Meckel's diverticulitis may simulate appendicitis. Blood, with or without mucus, in the stool favors diverticulitis. *Intussusception* must be considered, particularly in children under 5 years of age. Intermittent sharp pain, the presence of an abdominal mass and blood by rectum are the differential features. A barium enema, which is contraindicated in appendicitis, may be useful in confirming and localizing the intussusception.

Ovarian lesions, such as cysts, ruptured follicles or a twisted pedicle, must be considered in girls, especially in the older ones.

Acute rheumatic fever, diabetes mellitus, regional enteritis, abdominal epilepsy, sickle cell crisis, infectious mononucleosis and nonicteric infectious hepatitis must also be considered diagnostic possibilities; these are described in their respective sections.

When one is confronted with evident peritonitis, the possibility of a primary infection as well as one secondary to a ruptured appendix must be considered. The former lesion is now encountered so infrequently, however, even in patients with nephrosis, and the consequences of continued drainage from a ruptured appendix are so serious that the differential diagnosis should be established by laparotomy.

COMPLICATIONS. Whether localized abscess formation and diffuse secondary peritonitis (see below) are to be considered complications or part of the natural course of acute appendicitis may be debatable, but they are the only common sequels. Perforation occurs earlier and more frequently in children than in adults, and there is less tendency for the infection to become localized. This failure to localize has been attributed to the relatively small size of the omentum in young children. A pelvic abscess occasionally

occurs, but subphrenic abscess is rare. Less common complications are paralytic ileus and thrombophlebitis.

Postoperative complications of acute appendicitis include abscess of the operative wound, multiple intra-abdominal abscesses, intra-abdominal adhesions and intestinal obstruction.

PROGNOSIS. There is great danger in postponing operation for appendicitis, since local or diffuse peritonitis consistently follows perforation, and almost negligible risk attends operation before perforation. Even when perforation has occurred, the mortality rate may be less than 1 per cent. This low rate is probably due to several factors, including improvements in preoperative preparation, operative technique, anesthesia, parenteral fluid therapy and antibacterial therapy.

TREATMENT. Appendectomy, with adequate external drainage in cases of abscess formation, is the only appropriate treatment of acute appendicitis. High fever, dehydration, overwhelming sepsis and a shocklike state are reasons for delay until appropriate preoperative correction can be attained. Convulsions during anesthesia are common in children with high fever. Induced hypothermia, hydration and antibiotic therapy are indicated. The temperature should be below 39° C (102° F) and the pulse below 120 before anesthesia is initiated.

Reasonably early ambulation after removal of an unperforated appendix and dismissal from the hospital within a few days are usually possible.

NECROTIZING ENTEROCOLITIS

Necrotizing enterocolitis is a serious idiopathic disease of the newborn which occurs primarily in premature infants. It is characterized by gastric retention, abdominal distention, vomiting of bile, and blood-streaked and occasionally diarrheal stools. Earlier reports of "functional ileus," perforation of the ileum and colon, and colitis in the newborn infant probably represented forms of this condition.

The ileum and the colon are the most common sites of involvement; the duodenum is the least common. The condition is a complication of exchange transfusion or severe infections such as pneumonia, meningitis or omphalitis. *Pathologically* the intestine is dilated, necrotic and friable, with superficial ulcerations and submucosal hemorrhage. Perforation is common. Pneumatosis (intramural gas) of the intestinal wall may be present and often is a premonitory sign of perforation. The *roentgenographs findings* are (1) multiple dilated loops of small intestine with air-fluid levels in the erect position and separation of loops suggesting mural edema or peritoneal fluid, (2) intramural gas, (3) free air in the peritoneum, and (4) gas in the portal vein. Therapy is mainly supportive; intravenous alimentation and hydration are usually necessary. Gastric suction, blood transfusions and antibiotic therapy are always indicated. Surgical treatment is required for intestinal perforation.

PERITONITIS

Acute infections of the peritoneum are arbitrarily designated as *primary* when the focus is outside the abdominal cavity and the infection is blood- or lymph-borne. The infection is termed *secondary* when it is disseminated by extension from or rupture of an intra-abdominal viscus or of an abscess of one of the solid organs.

Peritonitis in the neonatal period may arise from a transplacental infection in utero; more frequently it is the result of infection acquired during or shortly after birth. It may be a manifestation of septicemia, a direct extension from an umbilical infection, perforation of the intestine or, rarely, the sequel of a ruptured appendix. After the neonatal period, peritonitis is uncommon until later childhood, when appendicitis becomes relatively frequent.

ACUTE PRIMARY PERITONITIS

ETIOLOGY. Primary peritonitis has become rare in children. In the past it was caused most often by the pneumococcus and the beta-hemolytic streptococcus, but now staphylococci and gram-negative organisms are being recovered more frequently. Ascites from nephrosis or cirrhosis is a major predisposing factor, but the disease may occur in otherwise healthy children. It is more common in girls than in boys and in some instances a nongon-orrheal vaginitis appears to be the portal of entry. Gonococcal peritonitis is a rare complication of gonorrheal vaginitis.

CLINICAL MANIFESTATIONS. The onset may be insidious or rapid, with extreme prostration, some abdominal pain and vomiting. Intestinal peristalsis usually continues until late in the disease, and diarrhea is common. The facial expression is likely to be anxious; there is often cyanosis, and the child appears toxic and weak. The temperature usually rises and may be as high as 40° C or more (104 to 105°

F); in very ill patients, and especially in young infants, it may be normal or subnormal. The pulse is rapid, small and compressible, and the respirations are rapid and shallow because of the pain which abdominal respiration produces. There is usually distention of the abdomen, moderate diffuse tenderness and a doughy resistance. Evidence of free fluid may be present. Rectal examination reveals tenderness. The white blood cell count is high, ranging from 20,000 to 35,000 cells per mm^3; 90 to 95 per cent are polymorphonuclear cells, with an increase in immature forms.

DIAGNOSIS AND TREATMENT. In most cases the clinical picture is indistinguishable from appendicitis with or without perforation, and the diagnosis should be established at laparotomy. If primary peritonitis is suspected preoperatively, paracentesis may be helpful. Gram-stain and culture showing only gram-positive organisms exclude an enteric source of infection and obviate the need for exploration. Supportive therapy and intravenous antibiotics chosen on the basis of the smear and culture are generally effective treatment.

ACUTE SECONDARY DIFFUSE PERITONITIS

ETIOLOGY. This type of peritonitis usually results from perforation of an abdominal viscus, most often an inflamed appendix. Peritonitis secondary to intussusception, volvulus, incarcerated hernia, perforation of the intestine by a foreign body or rupture of a Meckel's diverticulum is infrequent. Perforation of the intestine in meconium ileus and spontaneous rupture of the stomach or intestines are infrequent causes in the neonatal period, and perforation of a peptic ulcer, though infrequent, is more common in early infancy than in later childhood. The invading bacteria are most often coli-form bacilli with varying numbers of other organisms belonging mainly to the streptococcal and staphylococcal groups.

CLINICAL MANIFESTATIONS. The manifestations of shock from a ruptured viscus or the early symptoms of acute appendicitis are followed by an increasing toxemia, as evidenced by greater restlessness and irritability, by a higher temperature, often 39.5° C or more (103 to 105° F), by an increase in the pulse rate and, at times, by chills or convulsions. In extreme situations, and especially in early infancy, the temperature may be normal or subnormal. Vomiting, if previously present, is usually increased. The pain tends to be more diffuse over the abdomen, but may not be too notable if the patient remains quiet. Constipation is marked.

The child has an anxious expression, and there is progressive evidence of prostration. Dehydration and loss of electrolytes through vomiting are contributory factors. There are rapid pulse, splinting of the diaphragm, and rectal tenderness. Peristalsis may persist until late in the course of disease.

The white blood cell count is usually 16,000 to 25,000 per mm^3, the polymorphonuclear elements usually being above 90 per cent.

TREATMENT. Adequate preoperative preparation is essential and may require 6 to 8 hours. These measures include rehydration, correction of electrolyte imbalance, gastric suction and antimicrobial therapy. Combinations of antibiotics will improve the spectrum of effectiveness against aerobic and anaerobic organisms. Relief of pain by meperidine (Demerol), morphine or codeine contributes to improvement. The pulse rate should be reduced below 120 and the temperature below 39° C (102° F) if possible prior to operation. Severely ill patients may require mild hypothermia. Operative therapy consists in drainage and repair of the perforated viscus.

ACUTE SECONDARY LOCALIZED PERITONITIS

(Peritoneal Abscess)

ETIOLOGY. A single, localized pyogenic abscess, most often secondary to perforation of an inflamed appendix, is somewhat less common in children than in adults. The poor ability of young children to localize a peritoneal infection of appendiceal origin has been attributed to lower general resistance and to a relatively smaller omentum. Though localized peritoneal abscesses occur most often in the appendiceal region, they may be at any site, originating from various sources; or appendiceal infections may gravitate to other areas, notably the pelvis. An abscess in the subdiaphragmatic area may originate from an appendiceal or other intraabdominal infection or, rarely, from an empyema.

CLINICAL MANIFESTATIONS. The general symptoms *of peritoneal abscess* are continued fever or recurrences of it, poor appetite and vomiting following ingestion of food. The white blood cell count is increased, with a predominance of polymorphonuclear cells. With *appendiceal abscess,* tenderness in the right lower quadrant is extended, and there is often a palpable mass.

A *pelvic abscess* is suggested by abdominal distention, rectal tenesmus with or without the passage of small stools containing mucus, or bladder irritability. Rectal examination may reveal a tender mass anteriorly.

A *subphrenic abscess* is evidenced by physical signs at the base of the lung, usually on the right, owing to elevation of the diaphragm and frequently to the presence of pleural fluid. The diagnosis can often be established roentgenographically. The diaphragm is elevated and the liver depressed if the infection is on the right side, and there is frequently a pocket of air just below the diaphragm, owing to production of gas by bacteria.

TREATMENT. The abscess should be drained and appropriate antibiotic therapy provided. Initial broad-spectrum coverage should be modified, if indicated, by the results of sensitivity tests of the bacteria obtained from cultures. If the appendix cannot be removed at the initial operation, an appendectomy should be performed subsequently within 3 months.

ACQUIRED INTESTINAL OBSTRUCTION

Paralytic ileus is an important cause of acquired intestine obstruction. It is likely to occur as a complication of acute infections, especially pneumonia and peritonitis, and of electrolyte imbalance or uremia. It is likely to present as distention, with absence of bowel sounds and minimal pain. Pneumonia is probably the most frequent cause of paralytic ileus in infants; peritonitis, the most frequent in older children.

Incarcerated inguinal hernias and intussusception are the most frequent mechanical causes of intestinal obstruction in infants. Intestinal obstruction may also result from postoperative adhesions or those produced by acute peritonitis from which recovery occurred, or by chronic peritonitis, e.g., tuberculous peritonitis. Other causes are foreign bodies in the intestine, including fecal concretions and inspissated meconium in the newborn infant, late obstruction by intraluminal contents in cystic fibrosis (pseudomeconium ileus), and by masses of roundworms; tumors of the bowel, including mesenteric cysts, may also be obstructive.

Acute intestinal obstruction is classified as follows:

With a presence or absence of mechanical obstacle on:

a) dynamical; b) mechanical;

Dynamical intestinal obstruction depending on character of changes a tone of intestinal muscles on:

a) spastic; b) paralytic;

Mechanical intestinal obstruction with a presence or absence of compression the vessels of mesentery bowel on:

a) obturation; b) strangulation; c) mixed;

Originally: a) congenital; b) evoked [acquired];

With the arcade of intestinal maintenance:

a) complete; b) partial;

With the levels of obstruction:

a) small intestinal (high, low); b) large intestinal.

In the clinic of an **acute mechanical intestinal obstruction** distinguish three periods.

First period or the initial stage: depending on the type of obstruction, proceeds from 2 to 12 hours. The dominant sign in this period, especially at strangulation obstruction, there is pain which carries cramp character, often complicated pain shock. Already at first hour from the beginning of disease through the loss of water cellular degitratation of develops with an typical clinical picture: thirst, dryness of mucus, shells a skin, increase level of sodium in blood.

The second period, or intermediate stage, characterized haemodynamic violations. Pain becomes permanent, and abdomen is asymmetric, exaggerated. The complete delay of emptying and gases comes. An patient is disturbed by frequent vomit. The signs of dehydration grow, that clinically shows up low blood pressure, dryness of mucus shells and skin, nausea, vomit in default of thirst. This period proceeds from 12 to 24 hours.

The third period comes in more late terms. State of sick as heavy as lead, face of Hippocrates, and tongue is dry, frequent vomit with an unpleasant smell. Considerable of haemodynamic violations appear. The temperature of body is high. An abdomen is exaggerated, and peristalsis is abscent.

At the finger examination of rectum it is sometimes possible to define reason of intestinal obstruction: tumor, excrement stone, extraneous body, and in the cases of intussusception is blood or blood maintenance.

At an inspection it is necessary to pay and regard to positions the patient, they accept recumbency more frequent, but loaf rarely. Mien of during an attack - full of suffering. Without of and twinge and patient is concentrated and, even something frightened. The color of person at first is normal, then partly bloodshot, more late face of pale, lines are acuteened, and patient is covered and death-damp. In an late period of obstruction, when peritonitis joins, the lines of person become emaciated, with pale with an earthy tint skin.

The temperature of body in an initial period of obstruction does not rise usually. At the heavy forms of strangulation intestinal obstruction, when the state of collapse is an shock develops, the temperature of body can go down to $35,0^0$C, and when peritonitis develops - rises to $37,5^0$C - $38,5^0$C. Pulse at the beginning of disease substantially changes not, but in future becomes frequent, but in 8-12 hours from the beginning of disease frequency of pulse arrives at 120 b/min. and anymore. Thus of pays attention on itself disagreement between and low temperature and frequent pulse, that in an prognostic relation is unfavorable. An tongue at the beginning of disease is moist, however already in 6-8 hours becomes dry. An unpleasant smell appears from and mouth. An abdomen is exaggerated. In dependence on what part of abdomen is exaggerated, it is possible to judge about the place of intestinal obstruction, however reliable this sign is not always .

At palpation of front abdominal wall to development of peritonitis, it is not sickly, tension of it absents, the Blyumberg-Schotkin's sign is negative. During an active peristalsis which is accompanied and twinge, there is resistance of front abdominal wall and then palpation it heavily. By palpation in an abdominal region at an indigitation it is possible to find education. At obstruction on soil of obturation of it is sometimes possible palpation tumour, excrement stone.

At the analysis of data of laboratory inspection it should be remembered that an initial period of Acute intestinal obstruction is not in the global analysis of blood of changes. On more late stages erytrocytosis, leycocytosis is characteristic, with the change of leycocyt formula “to the left”, an eosinopenia and relative lymphocytosis. Haemoglobin of relatively rises to 180-200 gr/l.

An dysproteinemia, ionic violations, takes and place at biochemical researches. The concentration of chlorides especially goes down.

At research urine pay and regard to its amount. Oliguriya of testifies to dehydration of organism, an anury is and bad prognostic sign. Presence in urine of albumen, elements of blood, cylinders are the index of degenerative necrotizing changes in kidneys.

Survey X-ray and sciagraphy of abdominal region are the basic method of diagnostics of Obstruction. The Kloyber,s cups are thus determined - which remind upside-down bowls the loop of bowels, gap-filling and liquid and gas. Except for the Kloyber,s cups it is X-ray possible to look after the exaggerated bowels which form light, here and there with the ribbed picture arcs, returned and bulge up (the Kerkring,s folds). It is important to know that survey X-ray and it is necessary to do enemas to implementation, so as the Kloyber,s cups can be observed after an enema for patients without intestinal obstruction.

At the unclear clinical picture of disease considerable help laparoscopy can give in diagnostics. Diseases of allow to diagnose visual determination of the state of bowels, exposure of tumours, accretions and other changes, especially for the leadthrough of differential diagnostics between Acute intestinal obstruction and an Acute violation of mesenterial circulation of blood (heart attack of intestine). The loops of bowel are however exaggerated promote the risk of their damages at introduction of trocar.

At the ground of diagnosis attention applies on the form of Obstruction, its level and on present complications, above all things, peritonitis which determines medical tactic is widespread.

Important of an practical value has an leadthrough of differential diagnostics between mechanical and dynamic intestinal obstruction. The exact preoperated diagnosis is very important, as tactic these treatments of two types of intestinal obstruction different. Unlike of mechanical intestinal obstruction, at dynamic paralytic obstruction and stomach-ache carries, as an rule, permanent character from the first hour of disease. There are signs of basic disease which caused dynamic obstruction. At dynamic paralytic obstruction an abdomen is exaggerated evenly, soft, and peristalsis from the beginning is hyposthenic or absents. At spastic obstruction pain cramp, an abdomen is not exaggerated, often hollow.

An differential diagnosis must be conducted with a perforated gastric and duodenum ulcer, Acute appendicitis, Acute cholecystitis, Acute pancreatitis, peritonitis.

Tactic of treatment is determined a form and reason of Obstruction.

All of patients are with suspicion on acute intestinal obstruction, or with the set diagnosis, subject urgent hospitalization in surgical permanent establishments of II – III levels. On the before hospital stage medical measures are not conducted, after the exception of symptomatic therapy at an unstable hemodynamics.

Dynamic of obstruction is subject conservative treatment, mechanical intestinal obstruction in most cases needs operating interference. However, at first hour of disease, when differential diagnostics of dynamic and mechanical obstruction not always is possible, it is necessary to make an attempt the complex of conservative measures which can be useful both in diagnostic to medical plans.

Conservative treatment which is appointed all of patients in default of displays of peritonitis must be begun such measures:

1) decompressions of stomach and, on possibility, overhead departments of thin bowel; 2) influence is on the vegetative nervous system; 3) influence is on other organs and systems with the purpose of improvement of the general state of patient, desintoxication, normalizations of water-electrolyte exchange & other

The leadthrough of complex of conservative measures can bring success only at some forms of mechanical obstruction, mainly in the initial stage of development of disease, when changes are yet reverse (for example, at obturation of bowel on soil of helmint's invasion, in the initial stage of adgesions obstruction without strangulation, at the early forms of intussusception of bowels, in the initial stage of torsion of sigmoid bowel and other).

With the purpose of decompression of stomach and duodenum enter and probe. Evacuation of maintenance from the overcrowded an stomach considerably improves the general state of patient. Except for it, decompression of stomach is absolutely needed before an operation. It warns aspiration complications.

Appoint of an medical unloading complex which includes: 1 ml - 0,05% solution of proserini, 1 ml - 0,2% solution of aceclidini, 40-60 ml - 10% solution sodium chloride intravenously. After it execute and lumbar Novocaine blockade by 0,25% solution of novocaini -80-100 ml biside. An medical complex is completed an siphon enema. An interval between every manipulation must not exceed more than 15 minutes and they must be executed in the indicated sequence.

For of and siphon enema utillize water of room temperature in an amount 10-15 L. In place of hard tip utillize and thick rubber tube (rectal probe) which is entered through an rectum on depth 25-50 cm. In the process of manipulation watch, that bowel air did not enter. An siphon enemas is executed only in the presence of surgeon which watches after the rightness of its implementation, by the state of patient and estimates its results.

Appearance of emptying and pass gases after the leadthrough of the indicated measures is the sign of liquidation of intestinal obstruction only in those cases, when other signs disappear: pain, vomit, and pulse is normalized, the general state is improved.

Leadthrough of conservative treatment, directed on liquidation of intestinal obstruction, impermissible at all of types of mechanical intestinal obstruction with the signs of the expressed intoxication and dehydration of organism, at presence of "fecaloid" vomit or signs of peritonitis. Such of patient is rotin urgent operating treatment. An operation is executed also at unefficiency of conservative treatment, that in those cases, when after the conducted three times unloading complex of the phenomenon of intestinal obstruction dont allow.

Preparation before operation. The primary objective of preparation is an correction of violations of homoeostasis, caused violation of the intestinal communicating and inflammatory process in an peritoneal cavity, among which considered basic water & electrolyte disorders and endotoxicosis, which are considered as principal reasons of grave condition and unstable hemodynamics at acute intestinal obstruction, that fight against an infection. Basic indication to preparation are the expressed violations of hemodynamics (low blood pressure, instability of arteriotony), heavy intoxication (high indexes of maintenance of urea, kreatinine), presence of heavy concomitant pathology with decompensation of function vitally important organs and systems (above all things – cordio-vascular), presence of clinic of widespread peritonitis.

For an leadthrough preparations will apply the wide spectrum of facilities: infusion of blood substitutes and components of blood (plasma), introduction of antibiotics, vitamins, cardiotonics, desensibilaizd, inhibitors of proteasis & other of the choice of concrete facilities depends on the state sick. Duration of preparation makes, as and rule, 1 – 3 hours of the basic criterion of efficiency of the conducted therapy is stabilizing of haemodynamic indexes.

Operating treatment. For an anaesthetizing, as and rule, utillize general anaesthesia with the leadthrough of artificial ventilation of lights. Something of is rarer used peridural anaesthesia.

More frequent all for access utilized middle - middle laparotomy. Other incision (overhead, lower, lateral) apply for patients, where reason of Obstruction, vereification to the operation, needs the proper access.

It follows to specify that the basic tasks of operating interference at intestinal obstruction are:

1) clearing of obstruction;

2) estimation of viability the staggered area of bowel and determination of shows to resection of intestinal and decompressions of it;

3) proceeding in communicating of digestive tract;

4) sanation and draining the peritoneal cavity is at presence of peritonitis.

Measures on liquidation of obstruction depend on its reason. At presence of connections execute their dissecting (adheolisis) or liberation of organ from connections (viscerolisis).

At small intestinal obstruction it is necessary to try full to remove reason which caused it, up to the resection of bowel with imposition an interintestinal anastomosis (disconnection of connections, resection of bowel at a tumour, scission of bowel with the delete of gall-stones and oth.). It a rule does not belong to large intestinal obstruction, at treatment of which simultaneous imposition of interintestinal anastomosis can result in insolvency of guy-sutures and development of peritonitis. Only at right-side localization of tumour which stops up and colon bowel, for youths sick on the early stages of development of intestinal obstruction and right-side hemicolectomy is possible with imposition of ileotransversoanastomosis. In other cases more expedient: a) two-stage; b) three-stage operations.

Two-stage operation - on the first stage is resection of the staggered area of bowel is conducted with forming of unnatural anus by an oral loop. The second stage is proceeding in continuity of intestine by imposition of anastomosis between oral and aboral bowels.

An three-stage operation – 1th stage is an unloading unnatural anus of the oral place obturation without liquidation a reason of obstruction; the 2th stage - resection of the staggered area of bowel with imposition of interintestinal anastomosis; the 3th stage - closing the unnatural anus.

Important is decompression the extended bowel, which is instrumental in proceeding in microcirculation in the bowel wall, tone and peristalsis. Attaining this purpose is possible introduction through nose and leadthrough through all of the extended bowel, during an operation, long perforated and probe (Miller-Ebbot). Decompression intestine proceeds in and postoperative period during 3-4 days to stable renewal of peristalsis.

INTUSSUSCEPTION

Intussusception, an invagination of a portion of the intestine into a distal adjacent part, is a cause of intestinal obstruction in infants and young children from 3 to 24 months of age, but is rare both earlier and later. It is more common in males and in all infants from 3 to 11 months of age.

ETIOLOGY. In most instances intussusception develops in healthy infants without demonstrable cause. Correlations between intussusception and adenovirus infections have been equivocal. In about 5 per cent of the cases a specific lesion such as a Meckel's diverticulum, polyp, nodule of ectopic pancreas, duplication of the ileum, hypertrophied Peyer's patch, lymphoma of the bowel or intramural hemorrhage in anaphylactoid purpura serves as a lead point for the intussusception.

PATHOLOGY. Intussusceptions are most frequently ileocolic, ileo-ileocolic, and ileo-ileal in type, with the upper portion (intussusceptum) invaginating into the lower (intussuscipiens), pulling the mesentery with it. Swelling begins promptly from edema and hemorrhage secondary to venous engorgement, with resultant intestinal incarceration and obstruction. Most intussusceptions do not strangulate the bowel in the first 24 hours, but may lead subsequently to intestinal gangrene and systemic shock.

CLINICAL MANIFESTATIONS. In typical cases there is sudden onset of severe paroxysmal pain, which recurs at frequent intervals and is accompanied by straining efforts and loud outcries. Initially the infant may be comfortable and play normally between the paroxysms of pain, but if the intussusception is

not reduced, he becomes progressively weaker and goes into a shock-like state, with an elevation of body temperature to as high as 41° C (106° F). The pulse becomes weak and thready, the respirations shallow and grunting, and the pain may be manifested only by moaning sounds. Vomiting occurs in most instances and is usually more frequent at the beginning. In the later phase the vomitus becomes bile-stained. Fecal matter of normal appearance may be evacuated during the first few hours of symptoms. After this time fecal excretions are small, or more often do not occur, and little or no flatus is passed. Blood generally appears in the first 12 hours, but at times not for 1 or 2 days and infrequently not at all. Stools consisting chiefly of blood and mucus are common and are termed "currant jelly stools."

Palpation of the abdomen usually reveals a sausage-shaped mass, sometimes ill defined, which may increase in size and firmness during a paroxysm of pain and is most often in the right upper portion of the abdomen. It is more readily located by bimanual rectal and abdominal palpation between paroxysms of pain. The presence of bloody mucus on the finger as it is withdrawn after rectal examination supports the diagnosis of intussusception. Abdominal distention and tenderness develop as intestinal obstruction becomes more acute. On rare occasions the advancing intestine prolapses through the anus. This can be distinguished from prolapse of the rectum by the separation between the protruding intestine and the rectal wall, which does not exist in prolapse of the rectum.

Ileo-ileal intussusception may have a less typical clinical picture, the symptoms and signs being chiefly those of small intestinal obstruction. Recurrent intussusception is rare, with an incidence of no more than 2 per cent. Chronic intussusception, in which the symptoms exist in milder form at recurrent intervals, is more likely to occur with or following acute enteritis and may arise in older children as well.

DIAGNOSIS. In intussusception the clinical history and physical findings are usually sufficiently typical for diagnosis. Roentgenographically, abdominal scout films may show a mass-like density in the area of the intussusception. The film after a barium enema will show cupping in the head of barium as its advance is obstructed by the intussusceptum. A central linear column of barium may be visible in the compressed lumen of the intussusceptum, and a thin layer of barium may be seen trapped around the invaginating intestine (coil-spring sign), especially after evacuation. Retrogression of the intussusceptum under the pressure of the enema, and gaseous distention of the small intestine from obstruction are also useful roentgenographic signs. Ileo-ileal intussusception is usually not demonstrable by barium enema, but is suspected because of gaseous distention of the intestine above the intussusception.

Differential Diagnosis. Bloody bowel movements and abdominal cramps accompanying enterocolitis may usually be differentiated from intussusception because the pain is less severe and less regular and because the infant is recognizably ill between pains from the time of onset. Bleeding from Meckel's diverticulum is usually painless. The intestinal hemorrhage of anaphylactoid purpura is usually accompanied by joint symptoms or purpura elsewhere. It is important to keep in mind that intussusception may be a complication of any of the foregoing conditions, none of which is accompanied by a palpable abdominal mass in the absence of intussusception. Since tenesmus and a discoverable tumor are usually absent in ileo-ileal intussusception, it may be confused with ileal obstruction from other causes. This is of little clinical importance, since surgical exploration is indicated in any case.

PROGNOSIS. Untreated intussusception in infants is nearly always fatal; the chances of recovery are directly related to the duration of intussusception before reduction. The majority of infants will recover if the intussusception is reduced within the first 24 hours, but the mortality rate rises rapidly after this time, and recoveries are unusual when reduction is deferred to the third day. Spontaneous reduction during transport or preparation for operation is not uncommon.

TREATMENT. Reduction of the intussusception is an emergency procedure to be carried out immediately after diagnosis and after rapid preparation for operation with fluids and blood for shock and water and electrolyte repair. In many cases of short duration, when there are no signs of prostration, shock or peritoneal irritation, it may be possible to reduce the intussusception by hydrostatic pressure under fluoroscopic guidance and with the consultation and close proximity of a surgeon. The technique is described by Ravitch as follows:

The stomach is aspirated, intravenous administration of fluids is started, and a nonlubricated Foley bag catheter is placed in the rectum and inflated. The buttocks are compressed tightly and taped with adhesive plaster. A barium solution is then allowed to flow by gravity into the colon from a height of not more than 3 to 3½ feet above the fluoroscopic table. The abdomen is not touched during the procedure. Reduction of the intussusception is manifest by free filling of the small intestine, disappearance of the mass, passage of

flatus or feces and improvement in the infant's condition. Charcoal is then administered by mouth, and its recovery in an enema 6 hours later is further evidence of intestinal patency. If there is any doubt about the completeness of the reduction, an exploratory operation is performed immediately.

Reduction by the hydrostatic technique is not effective in ileo-ileal intussusception and will resolve only the colonic component of ileo-ileocolic intussusception. With adequate surgical management, operative reduction carries a very low mortality rate in early cases, and has the advantage of more certainty of reduction and of demonstration of any lead points, some of which may be removable. The recurrence rates for operative and nonoperative methods are apparently about equal. When the intussusception is irreducible or the bowel gangrenous, the involved intestine must be resected promptly.

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