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Ukrainian Medical Stomatological Academy

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METHODICAL INSTRUCTIONS

FOR STUDENTS` SELF-WORK

WHILE PREPARING FOR PRACTICAL LESSONS

Educational discipline	Pediatric Surgery
module №5	Congenital Anomalies in Children
Theme of the lesson	Anomalies of the anterior abdominal wall: inguinal hernias, umbilical hernias, omphalocele and gastroshisis
Course	VI
Faculty	foreign students preparation

POLTAVA 2020

1.The topic basis: The topic “Anomalies of the anterior abdominal wall: inguinal hernias, umbilical hernias, omphalocele and gastroshisis” 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.The aims of the training course:

1. **To know**:

· determination of concept is «abdominal hernia»;
· modern looks to etiology and pathogenesis of abdominal hernia;
· classification of abdominal hernia;
· mechanism of origin of abdominal hernia;
· determination of concept is a hernia gate, hernia sack and his component parts;
· anatomy-topography features of abdominal hernia;
· features of clinical motion of abdominal hernia;
· differential diagnostics of abdominal hernia;
· principles of surgical treatment of abdominal hernia;
· prophylaxis of relapse of abdominal hernia;
· classification of strangulation acording the mechanism of origin and clinical variants;
· pathogenesis of violations is at complications of abdominal hernia;
· basic clinical signs are at complications of abdominal hernia;
· differential diagnostics of complications of abdominal hernia;
· medical tactic at complications of abdominal hernia;
· tactic of surgeon at the independent setting of the strangulated hernia;
· features of operative interference are at inflammation of hernia;
· postoperative conduct of patients.

2**. Able:**

- to conduct the objective inspection of patients with abdominal hernia;
- to set a diagnosis depending on development of the hernia;
- to define indications and contra-indications to operative treatment;
- to conduct differential diagnostics of abdominal hernia;
- to define the methods of the plastic arts of hernia gate at abdominal hernia;
- to define surgical tactic at sliding hernia;
- to define the prophylaxis of postoperative complications and examination of capacity;
- to inspect patients with the strangulated hernia and determine the basic symptoms of strangulation;
- to conduct differential diagnostics between the strangulated and irreducible hernia, inflammation of hernia, vicious strangulation;
- to determine surgical tactic at strangulation;
- to ground shows to operative interference and preoperative preparation at strangulation;
- to ground the sequence of operative interferences at the phlegmonas of hernia sack;
- to define viability of the strangulated organ and shows to the resection of bowel;
- to conduct a patient in a postoperative period;

3. **To capture practical skills**:

- to collection of anamnesis for patients by the different forms of hernia;
- objective examination of patients with abdominal hernia;
- palpation of external ring of inguinal channel;
- determination of method of anesthesia and choice of the most optimum method of operative interference;

- methods preparations of the patient to operative treatment;
- drafting of plan of conduct the patien in a postoperative period in dependence on the volume of the executed operation;
- methods of postoperative conduct of patients.

3.Basic knowledge, skills, habits necessary for studying the subject (interdisciplinary integration).

Names of previous disciplines	**Obtained skills**
1. Anatomy, operative Surgery, Topografic Anatomy	Anatomy of the abdominal cavity organs, topographic anatomy of the abdominal cavity and anterior abdominal wall. Set the places of execution of operative accesses in the developmental abnormalities of the anterior abdominal wall, assess pathological changes in the abdominal cavity
2. Physiology.	Anatomico-physiological properties of the digestive system and the system of hemostasis
3. Pathological Physiology	Indicators of a general analysis of blood, urine, biochemical blood test, coagulogram of acid-base state in norm and pathology. To distinguish between normal and pathological indicators, to interpret changes.
4. Surgical diseases, operative Surgery and topographic anatomy.	Surgery and topographic anatomy. Identification of priority research methods and indications for surgical intervention. Principles of care for surgical patients. Clinic, diagnosis, treatment of intestinal obstruction. Measure CVP, establish gastric tube, urinary catheter, catheterize veins
5.Propedeutics of childhood diseases Faculty and hospital pediatrics, neonatology	Examination of a child with intestinal obstruction. Symptoms of pathology of the abdominal organs in infants Measure blood pressure, heart rate, the number of respiratory movements per minute, conduct a survey of the abdomen (palpation, percussion, auscultation), rectal examination
6.Pharmacology and Clinical Pharmacology	Pharmacology, pharmacodynamics and pharmacokinetics of drug groups that are used in the surgical pathology of abdominal organs in infants Calculate doses of drugs in the provision of emergency care and different routes of administration
7. Radiology	Interpretation of X-ray examination data. Recognize on the roentgenograms of the Clauber Bowl, free gas, free fluid in the abdominal cavity, evaluate the

	airway intestine Radiological anatomy of the abdominal cavity organs is normal. X-ray changes in intestinal obstruction, peritonitis, perforation of hollow organs.

Thereotical questions for the lesson:

1. Omphalocele. Classification. Diagnostics. Treatment.
2. Gastroschisis. Clinic. Differential diagnostics. Treatment.
3. Umbilical hernia. Clinic. Treatment.
4. Inguinal hernia. Clinic. Differential diagnostics. Treatment. Complications.

4.Maintenance of the subject

1. Determination of concept of hernia.

Hernia of abdomen is an output of organs through the natural or artificial openings of abdominal wall, together with a parietal peritoneum which covers these organs.

Elements of hernia: hernia gate, hernia sack, content of hernia.

A hernia gate show by itself weak points in the musculo-aponeurosis wall of abdomen, through what internal organs with a parietal peritoneum go out from an abdominal region. Such weak points can be the natural ducting (inguinal, thigh, umbilical, cracks between aponeurotic fibers, which form the white line of abdomen, semilunaris line, obturatorius opening).

Hernia sack is swelling of parietal peritoneum through hernia gates. In it distinguish gate, neck, body and bottom. Gate name part of hernia sack, which abuts upon an abdominal region. The neck of hernia sack is name the narrow department of hernia sack which is in the thickness of abdominal wall - in a hernia gate. A body is his greater part. The distal department of hernia sack is named a bottom.

A table of contents of hernia is internals which went out in a hernia sack. More frequent all a hernia sack contains the most mobile organs of abdominal region (large omentum, thin bowel).

2. Reasons of origin hernia.

Etiologic factors are divided into local and general.

The features of anatomic structure of area of output of hernia behave to local etiologic reasons. To them take an inguinal channel, through which a spermatic cord, femoral channel which femoral vessels pass through, passes for men.

General reasons are divided into favorable and formative. To the factors contributory infringement belong: age, floor, build, emaciation of body, frequent births, traumas of abdominal wall, postoperative scars, and violations of innervations muscle of front abdominal wall.

Reasons which form hernia can be divided into two groups: 1) those which promote intraperitoneal pressure, 2) those which weaken an abdominal wall.

To the first belong: 1) disorders of defecation (constipation), 2) cough, 3) scream, 4) urination (strictures of urinary channel, hypertrophy of prostate, fymosis) 5) is laboured game on wind instruments, 6) tight collection of stomach, 7) difficult confinements, 8) vomit, 9) hard physical work.

To the second group of relating 1) repeated pregnancies which stretch and retinens an abdominal wall, 2) old age, illnesses which cause emaciation and weakening of musculature of body; in addition, protracted starvation, 3) various traumatic damages of front abdominal wall.

3. General symptomatic of hernia.

Diagnosis mainly set on the basis of objective symptoms. Subjective the signs of hernia are erected mainly to pain, especially at the physical loading. The origin of pain coincides with the moment of fall of organs in a hernia sack. At sliding and recurrent hernia pain has permanent

character. Except for him hernia can be accompanied nausea, vomit, locks, swelling of stomach, urine displays (at sliding hernia, when its contents is a urinary bladder).

The objective sign of hernia are swelling in those places, which after the anatomic placing are typical for this pathology.

By confirmation this can be independent disappearance of the hernia swelling or after setting of him in an abdominal region and the repeated appearance at a cough.

The second objective sign of inguinal hernia is a presence of the extended external opening of inguinal channel and feeling «cough push» at digital examination of inguinal channel.

4. A value of form and sizes of hernia is for motion of disease.

A large value has sizes of hernia in motion of disease, so as known that hernia of small sizes of strangulating more frequent (femoral strangulating more frequent, than ventrally).

Direct inguinal hernia has an oval form, incident to the people old years, more frequent is bilateral and almost never goes down in scrotum. At sliding hernia, swelling has a longer form. Such hernia of meet is mainly in mature age, placed the hike of inguinal channel and often goes down in scrotum.

At large hernia if it be impossible the plastic arts local tissues are use methods which auto, homo-, are conducted at, heteroplastic.

5. Classification of external hernia of abdominal wall.

By the place of formation (anatomic):

- inguinal
- femoral
- umbilical
- white line of abdomen
- para-umbilical
- obturatorim
- perineum
- Spiegel's line
- triangles of Pti and Lesgafta-Gryunfelt
- process xiphoideus

By etiology:

1. Congenital. 2. Acquired

- anatomically conditioned
- recurrent
- postoperative
- posttraumatic
- neurological

Clinically:

1. Non complicated;
2. Complicated:

- irreducible
- strangulated
- with the phenomena of coprostasis
- with the phenomena of inflammation
- damage of hernia
- tumors are in hernia

In size of hernia gate: small (till 2 cm), middle (2-4 cm), large (more than 4 cm) and giant hernia

6. Hernias of the line alba (white line)

11% from the general amount of abdominal hernia. They can arise up in the different areas of white line. Between the fibrotic fibres of white line there are cracks and deepenings

which can be favourable anatomic factors in formation of epigastric mass. After localization they can be super-umbilical, paraumbilical and rarely sub-umbilical. They rarely are large, at times a process can stop on the stage of lipoma pre-peritoneal.

The clinic of epigastric mass consists of two main symptoms: pain is for the step of white line and presence of thrusting out. Pain carries different character and is different intensity. There can be symptoms of cholecystitis, ulcerous illness and other diseases of organs of abdominal region. It is explained a hit in the hernia sack of these organs, their connection or by inflammatory changes in omentum. Hernia of white line is instrumental in formation of row of physiopathology processes which the symptoms of ulcerous illness can develop on the basis of. Therefore at the unusual irradiation of pain and presence of symptoms, characteristic diseases of organs of abdominal region it is necessary to conduct the proper inspections.

At the inspection of patient find dense painfully formation in the area of white line of abdominal wall. At reducible hernia it is sometimes possible palpation hernia gate. For some patients hernia flow unsymptomatic.

Differential diagnosis. Hernia of linea alba can simulate lipoms, fibrolipomas, neurofibromas. The general sign of these tumours is them free displacement together with a hypoderm in a fold, absence of pain and hernia gate. In addition, hernia of white line can simulate plural tumours of other areas of body (lipomatosis, metastasis tumours.

Treatment :

Treatment is only surgical, if there is not contra-indication to the operation. After the delete of hernia sack and suture of parietal peritoneum execute autoplastic of abdominal wall.

7. Umbilical hernia.

Name the output of organs of abdominal region umbilical hernia through the defect of abdominal wall in the area of belly-button. At normal development a umbilical ring overgrows fully. To the skin, fascia umbilicalis and peritoneum adjoins directly. An important circumstance in genesis of umbilical hernia is insignificant mobility of peritoneum in the area of belly-button and gradual increase of hernia's sack, which takes a place mainly due to a extension peritoneum. In this connection, progress of process is related to the tears of hernia's sack, formation of connections, accretions and partitions.

Umbilical hernia for adults is 5-12% from all of hernia of front abdominal wall. More frequent meet for women and people of old age.

Reasons of umbilical hernia for children and adults are different. For children they are investigation of excalation of umbilical ring, above all things abdominal fascia which covers him from within. Considerable predominance of frequency of umbilical hernia for women is explained anatomy features - more wide white line of stomach and weakness in the area of umbilical ring, by pregnancy and births. Hard physical work, locks, exhausting illnesses, obesities, is instrumental in formation of umbilical hernia. Umbilical hernia is often combined with a hanging down abdomen, diastasis of direct muscles of abdomen.

Classification

Distinguish:

1) hernia of umbilical cord (embryo hernia);
2) children's umbilical hernia;
3) adult's umbilical hernia.

Umbilical hernia for adults divide into direct a oblique.

Clinic. Small reducible umbilical hernia can flow unsymptomatic. Sometimes the first complaints appear at strangulation of hernia. At large hernia coused pain is in the area of belly-button which can increase after meal and physical loading. Sizes of hernia gate can be considerably less sizes, than hernia's thrusting out. It forms anatomic pre-conditions for development of such complications, as chronic obstruction of intestine, coprostasis, strangulation. In horizontal position of the patient swelling disappears or diminishes in sizes. Through the refined skin which covers thrusting out, it is possible to notice the peristaltic waves of intestine.

Diagnostics of umbilical hernia is not difficult, but it is necessary to mean that a small compression in the area of belly-button can be the metastasis of cancer of stomach in a belly-button. All of patient it is necessary to conduct X-ray research of the stomach and duodenum and gastroduodenoscopy umbilical hernia with the purpose of exposure of diseases concomitant hernia which initiated pain in the overhead half of stomach.

Treatment only surgical, if there is not contra-indication to the operation. After the delete of hernia's sack and suture of parietal peritoneum do plastic of abdominal wall. At small hernia it is possible to utilize the method of Lexera.

Method of Lexera. Section of skin surrounding hernia's arched, tumour from below. A skin and subcutaneous basis a layer is removed by a layer up to the top. After the delete of hernia's sack, under control a finger, entered in a umbilical ring, on aponevrosis round a ring impose guy-sutures which is tightened. The floor of purse guy-sutures is imposed by 3-4 guy-sutures on the front walls of vagina of direct a muscle abdomen.

8. Oblique inguinal hernia

Inguinal hernia goes out from an abdominal region in two ways: through lateral and through middle inguinal fossa. Oblique inguinal hernia appears in first case, in the second is a line. Diagnostics of typical inguinal hernia is not heavy. Patient complane about pain in an inguinal area which increase at walking, physical loading, and appearance of thrusting out, which at oblique inguinal hernia has oval form, and at lines - rounded. Oblique inguinal hernia is disposed for the step of inguinal channel.

A oblique is the most widespread and frequent form. It goes out from the cavity of abdomen through lateral inguinal fossa and goes the same a way which before a testicle went down together with a peritoneal sprout. It is located in the layer of spermatic cord from one side and ahead of his vessels and spermatic channel.

Depending on the degree of development distinguish the followings types of oblique inguinal hernia:

1) initial (incomplete) hernia, when swellingoutwardly is almost unnoticeable, but when a patient strains an abdominal press, a finger, entered in an inguinal channel through an external inguinal ring, feels the tense swellin oval form, which disappears quickly, as soon as a patient stops to be strained;

2) channel form of hernia, when the bottom of hernia's sack comes to the external ring of inguinal channel, but outside its keeps indoors;

3) hernia spermatic a rope - when a hernia sack goes out outside the external opening of inguinal channel and located on a different height spermatic a rope, in these cases in an inguinal area palpation different form tumular formation;

4) inguinal-scrotum hernia goes down in scrotum and stretches it sometimes to the considerable sizes.

Fully developed scythe inguinal hernia outwardly is covered such tissues: 1) skin and subcutaneous fatty basis; 2) superficial fascia; 3) aponevrosis of external oblique a muscle abdomen; 4) cremaster; 5) a general vaginal shell is for a testicle and spermatic cord; 6) hernia sack.

In a norm an inguinal channel presents orifice-like space filled for men a spermatic cord, for women - by the round ligament of uterus. Walls of inguinal channel: front - aponevrosis of external oblique muscle of abdomen; lower - inguinal ligament; back - transversal fascia of abdomen; upper - a free edge of internal oblique and transversal muscles of abdomen.

A congenital inguinal hernia arises up then, when a peritoneal sprout remains fully opened and its cavity is freely reported with an abdominal region. A congenital inguinal hernia at which a peritoneal sprout is a hernia's sack is formed in future. A congenital inguinal hernia mainly meet for children (90%), but sometimes adults have them (10%).

At first hernia of thrusting out appears at the considerable physical loading, and in future at rising, cough, sneeze. In recumbency, swellingdisappears. Sometimes for this purpose it is

necessary on swellingto press a finger or palm. Hernia's of swellingcan be different size which depends on the width of hernia's gate and duration of existence of hernia.

An objective examination complements and specifies conclusions which are done on the basis of complaints and anamnesis. A review sick is upended given by the picture of asymmetry of inguinal areas. At presence of swellingof abdominal wall it is possible to define sizes and form of hernia. At palpation determine consistency of thrusting out, its surface, grumbling of intestine, at percusion is a sound (timpanitis, dulling). Digital examination of the external opening of inguinal channel is executed in horizontal position of patient, after setting of hernia. The end of index finger must be placed at the bottom of the proper side of scrotum and carefully invaginate skin of scrotum, get a finger in the external ring of inguinal channel, which is located to the middle and a bit higher pubic tubercle. In a norm the external ring of inguinal channel for men skips a finger-point. If by a finger to close a gate and compel a patient to cough, the finger of doctor will feel the shove of organs - **symptom of cough push**. Probe an inguinal channel on either side.

Diagnostics of inguinal hernia for women is based on a review and palpation, so as introduction of finger to the external ring of inguinal channel is impossible. The cyst of round ligament of uterus does not change the sizes at horizontal position of sick, a percussion sound above it is dull, but hernia changes the sizes and above it a tympanic sound can be determined. Treatment of cyst of round ligament of uterus is surgical so as well as inguinal hernia. An operation consists in remote cysts with next the plastic arts of inguinal channel.

Treatment of inguinal hernia is surgical. A purpose of operation is the plastic arts of inguinal channel. The first stage is access to inguinal channel. The second stage is a selection and delete of hernia's sack. The third stage is sew up of deep inguinal ring to the normal sizes (0,6-0,8 cm). The fourth stage is the plastic arts of inguinal channel. It is necessary to take into account at the choice of the plastic arts of inguinal channel, that principal reason of formation of inguinal hernia is a weakness of back wall of inguinal channel.

Strengthening of front wall of inguinal channel is with the obligatory inseaming of deep inguinal ring to the normal sizes. It can be executed for young men at small oblique inguinal hernia.

At lines inguinal hernia and difficult forms of oblique inguinal hernia (with the corrected channel, sliding hernia, recurrent, for people old years) it is necessary to execute strengthening of back wall of inguinal channel.

Sliding hernia is hernia, in what one from the walls of hernia's sack there is an organ which is partly covered a peritoneum (ascending and descending colon, urinary bladder). Sliding hernia of colon more frequent is at oblique inguinal hernia, and urinary bladder - at lines inguinal hernia. They can be congenital and acquired.

Acquired sliding hernia arise up as a result of mechanical collection the peritoneum of adjoining to it segments of bowel or urinary bladder, which do not have a serosal tunica.

Sliding hernia of colon does not have special symptoms. Usually it is large hernia with a wide hernia's gate for old men and senile. Diagnostics is helped by X-ray research of colon.

At sliding hernia of urinary bladder of patients can disturb disorders of urination or urinations in two receptions. At suspicion on sliding hernia of urinary bladder it is necessary to do cystography.

Treatment - only operative. The section of hernia's sack must be done in his thin part. A peritonization of areas of bowel is with their next setting in an abdominal region. Conduct the plastic arts of hernia's gate depending on the type of hernia, on one of afore-mentioned method

9.Direct inguinal hernia.

Direct inguinal hernia take beginning in the area of medial inguinal, go straight in a sagital plane and go out under a skin through the superficial ring of inguinal channel which provides them a round form. They often are bilateral, develop gradually, does not almost disturb patients. Direct inguinal hernia rarely is largenesses and practically does not go down in a

scrotum. A spermatic cord and lower epigastric artery is disposed from outside from a hernia's sack

In relation to a spermatic cord direct hernia is disposed to the middle from him. It appears when inguinal interval of three-cornered form or largeness of oval form. At investigational direct hernia always mark the weakness of all of tissues of inguinal area. Direct hernia meets rarer oblique and in most cases for people old years.

10. Femoral hernia

Disposed in a Scarp's triangle and on frequency of formation are 5-8% all of hernia. Most frequency of femoral hernia for women is explained more wide pelvis which stipulates greater expressed of muscul and vascular lacuns and less durability of inguinal ligament.

Femoral hernia in the process of forming pass three stages: initial, channel and complete.

Diagnosing. The diagnosis of initial and channel hernia hardness. The characteristic signs of complete femoral hernia is the hernia swellingin the area of bend of femoral hernio-inguinalis as hemispheric formation of small sizes, which is located under an inguinal ligament to the middle from femoral vessels. Hernia appears swellingat vertical position of body, tension of front abdominal wall; at setting hernia disappears, at times with grumbling. The sign of hernia is also a symptom of "cough push" which can be positive even at initial hernia.

A differential diagnosis is conducted with inguinal hernia. Femoral hernia is subjacent inguinal ligament, inguinal - higher. In relation to tuberculum pubicum femoral hernia is subjacent and outside, inguinal - higher and to the middle.

For femoral unreducible hernia lipoma which is located in the overhead department of Scarp's triangle can be accepted. It has a lobe structure and unconnected with the external opening of femoral channel.

A lymphatic nodules can simulate femoral hernia. Taking him fingers, it can draw aside a lymphatic nodules and find out absence of his ligament with a femoral channel.

An anevrismatic inflow has similarity of femoral hernia it in a femoral vein. A skin above the extended vein is refined, bluish, above hernia there is a skin of ordinary color. At coughing the retrograde flow of blood is felt in anevrismatic expansion, at hernia is a symptom of "cough push".

Treatment of femoral hernia is surgical.

11. Postoperative hernia

Appear in the area of postoperative scar. Reasons of formation of postoperative hernia: completion of operation tamponing and draining of abdominal region; suppuration of postoperative wound; decline of regenerative ability of tissues; the considerable physical loading is in a postoperative period; a damage of nervous barrels is during an operation.

A hernia's gate which are formed the edges of muscles and aponevrosis is located in the area of postoperative scar, that divided for the lines of postoperative scar. Edges of hernia's gate of hard as a result of development of dense cicatrical fabric. External coat of postoperative hernia is presented cicatrical tissues, intimately accrete with a hernia's sack or skin with subcutaneous tissues and postoperative scar in the middle. Hernia's sack often may be multicamerate, and hernia clumsy.

To recognize postoperative hernia not hardness. Presence in the area of postoperative scar of the hernia's thrusting out, which appears at tension, cough, is sufficient for establishment of diagnosis.

Classification

Classification:

1. On the state hernia contents: strangulated; adroit; partly clumsy; clumsy.
2. According to sizes: small - to 5 cm; middle - from 6 to 15 cm; large - from 16 to 25 cm; enormous - from 26 to 40 cm; giant - over 40 cm.
3. According to localization of the hernia thrusting out: overhead-middle; middling middle; upper-middle; lateral.
4. On a form the hernia thrusting out: one-camerate; multi-camerate.

5. According to the numbers of the hernia thrusting out: single; multiple.
6. At times origin of hernia: early; late.
7. According to the degree of violation of capacity: without violation of capacity; with limitation of capacity; with the loss of capacity.

A clinic depends on the size of the hernia thrusting out, localization, character of contents, accompanying pathology.

A permanent complaint is swellingin the area of postoperative scar. Except for it, patients are disturbed pain in the area of hernia, postoperative disorders, discomfort in an abdominal region, disorders of emptying. For patients with large hernia a permanent symptom are locks. Urine disorders can be for patients after laparotomy and indrawing in hernia of urinary bladder.

It follows to conduct the review of patients in position on the back with resulted to by a thorax chairman and upright. Pay a regard to localization of the hernia thrusting out, his form, size. At palpation hernia determine its form, size, adroitness or clumsiness, sizes of hernia gate. From the instrumental methods of X-ray and sciagraphy research of gastroenteric highway, spirography, ECG, have a substantial value.

Treatment is surgical. At small hernia it is possible to do the plastic arts of hernia's gate own tissues. During an operation concerning large hernia utillize the methods of autoplastic, alloplastic and methods of combined the plastic arts of defects of abdominal wall.

Prophylaxis: 1) a choice of correct operating access is without the considerable damages of muscles of aponevrosis and nerves; 2) a waiver is of application of resorption of material of interrupted sutures; 3) limitation of indications for tamponing and draining of abdominal region; 4) anatomic layer sew up of wound of abdominal region; 5) an exception of the surplus physical loadings is after an operation.

12. Strangulation hernia

Distinguish:

- direct strangulation (elastic);
- excrement strangulation;
- Hernia of Rikhter's;
- retrograde strangulation (hernia of Maydlya);
- strangulation of Mekkel's diverticul (hernia of Littre)

In strangulation of hernia of front abdominal wall a leading role is played by the increase of intra-abdominal pressure. At this time there is a brief increase of hernia gate and internalss go out in the area of lower pressure - hernia sack. Thus the organs of abdominal region are blocked in a hernia sack at the level of reduction of hernia gate. Such strangulation is named elastic.

At the excrement strangulation the upper department of bowel is gradually filled intestinal contents, squeezing a taking department in the neck of hernia sack. A disease develops gradually at in relation to wide hernia gate.

Next to typiforms, strangulations meet other variants of development of disease. Yes, at the wall strangulation (Rikhter's) the particle of wall of bowel compresses only for opposite edge of mesentery. The hernia swelling has small sizes and hardness to find him, especially for complete patients.

At the retrograde strangulation (hernia of Maydlya) in the hernia gate of obturation there is not only a mesentery of loop of bowel which is in a hernia sack but also hernia of loop of bowel, located in an abdominal cavity. Necrotizing changes in the strangulated loop of bowel accompanied penetration of bacteria through the walls of bowel and infecting of «hernia water». Festering necrotizing changes spread on surrounding tissues. The phlegmon of hernia sack appears in this case.

The estimation of the general state of patients includes for itself:

- term of strangulation;
- age the patient;
- presence of concomitant diseases;
- presence of complications.

Differential diagnosis.

At the strangulated oblique inguinal hernia it is necessary to conduct differential diagnostics with orhiopathies (orhitis, orhiepididimidis, hydropsy).

Acute orhiepididimidis is begun with acute pain in the area of testicle, the irradiation of pain is marked for the step of spermatic cord, fever. A testicle is pulled up to the external opening of inguinal channel, becomes dense, quickly increased in sizes, sings of intestinal obsrucnion are absent.

Rarer appendicitis can simulate the clinic of the strangulated hernia in a hernia sack. Such placing of appendix is predefined the presence of long mesoceccum, due to which a blind gut together with a sprout goes down in a hernia sack. Acute appendicitis creates in the place of thrusting crumble pain due to an inflammatory exsudate, a hernia sack is increased in sizes, there is inflammation of hernia. To set a correct diagnosis in these cases to the operation not succeeded practically.

In some cases the diverticulum of iliac bowel strangulation in hernia. Strangulation of diverticulum of iliac bowel of moreover arises up in inguinal and femoral hernia. The preoperated diagnostics is practically impossible.

Sometimes in place of the strangulated femoral hernia diagnose inguinal limphadenitis or "cold" abscess, which arises up at a trachelokyphosis, and goes down downward on the front surface of large lumbar muscle. Help to set a correct diagnosis in this case anamnesis and given objective research of patient.

13. Surgical tactic is at strangulation.

Treatment: The strangulated hernia is subject urgent operative interference, regardless of terms, variety, localization of strangulation.

Than before from the moment of strangulation operative interference is conducted, that blessing his more pleasant investigation. Frequency of complications and lethal consequences is in close intercommunication from time which passed from the moment of strangulation to the operation.

Methods of setting of the external strangulated hernia both on to the hospital stage and in permanent establishment impermissible. An exception can be patients with the acute heart attack of myocardium, with heavy concomitant diseases in which not more than 1-2 hours passed from the moment of strangulation. Before setting empting an urinary bladder and intestine, subcutaneous enter 1.0 ml - 0,1% Atropine sulfate or 1 ml - 0,2% Platyphyllinum. A patient get position, lying on the back from at heaved up a pelvis, and on the area of the strangulated hernia lay a warm hot-water bottle. Setting of the strangulated hernia can result hands in the so-called imaginary setting, one of the most heavy complications of the strangulated hernia. Select five forms of the imaginary setting of hernia:

1. Result of moving of organs from one chamber in other at a multicamerate hernia sack;
2. At the rough setting it is possible to dissociate all of hernia sack from surrounding tissues and together with the strangulated organs to set them in an abdominal region or dip a cellulose in a pre-peritoneum;
3. Dug up necks from other departments of hernia sack and setting of it together with the strangulated organs in an abdominal region;
4. At the rough setting it is possible to tear off a neck both from a body and parietal peritoneum and together with the strangulated organ to set in an abdominal region;
5. At the rough setting of hernia it is possible to tear the strangulated bowel.

14. Features of operative interference are at the strangulated hernia.

Treatment of the strangulated hernia is operative. The radical operations of hernia conduct under general anestesia. After incission of skin and selection of hernia sack, an operating wound is fenced off gauze serviettes. A hernia sack is exposed, delete hernia water and audit strangulated organ. About viability of the strangulated tissues it is possible to judge on a kind and smell of transudate, which is contained in a hernia sack. If it is light or straw-colour, the organs of, what are strangulated viable, governed their necrosis of transudate,

governed, darkly brown color with the smell of rotting. After fixing of strangulated organ in a wound dissect a strangulation ring in the most safe direction. Strangulation organ is released from connections with a hernia sack and destroy outside with areas bowels which were in an abdominal region . Viability of the strangulated organ is estimated after the release of him from strangulation structures.

15. Signs of viability and lack of viability of bowel

The implicit signs of lack of viability of bowel is:

- dark color of bowel;
- dullness of serosa;
- absence of pulsation of vessels of mesentery;
- aperistalsis.

The implicit signs of viability of bowel is :

. darkly rose color of bowel ;

. a viseral peritoneum is smooth, under a serose there are small hemorrhages;

. it was swollen a mesentery, the pulsation of vessels is saved, there are not blood clots in large vessels;

. after warming up a color becomes red, appears peristalsis;

At a doubt in viability of bowel it is necessary to execute its resection, giving up the limit of necrosis 30-40 cm in oral direction and 15-20 cm in aboral.

16 . Inflammation of hernia

Arises up as a result of penetration of infection in a hernia sack. It can take a place at inflammation of червоподібного escape, diverticulum of Mekkel's, which are in a hernia sack during the perforation of typhoidal or tubercular ulcers of bowel in the cavity of hernia sack.

The source of infection can be inflammatory processes on a skin in the area of hernia. At inflammation hernia is increased, painfulness appears and dermahemia. A temperature rises, a pulse becomes more frequent, the function of gastroenteric highway is violated (gases, delay of emptying and pass gases, nausea, vomit). Investigation of inflammation of hernia can be formation of connections in a hernia sack and hernia becomes unreducible. At progress of process development of phlegmon of hernia sack is possible. At the phlegmon of hernia sack execute the operation by Zamter's: find strangulated organ mobilize him. Conduct the resection of nonviable bowel with the next forming of anastomosis. Then pass to operative interference with to the area of the hernia thrusting out. Unseal a skin and remove is strangulated organ together with a hernia sack. Drain, surgeon interrupted sutures do not sew up or impose a wound, and in future it is treated according general principles. In such terms to conduct a hernioplasty beside the purpose, because the heavy phlegmon of abdominal wall develops in future.

17 . Damage (trauma) of hernia:

There can be a backwall of contents of hernia or violation of safety damages walls (dug up), which draw development of peritonitis, intra-abdominal bleeding or haematoma and inflammation of hernia .

To the break of loop of bowels, urinary bladder, and commotio – cavitum organs, stuffing-box, viseral organs. There are wilful enterorrhexiss in hernia, and also breaks as a result of the closed or opened trauma of hernia.

The damage of bowel in hernia causes development of peritonitis. Consequently, clinically shows up the signs of acute abdomen which requires urgent operative interference.

18 . Intestinal obstruction is in hernia.

By complication of unreducible hernia for the patients of senium there can be a coprostasia. There are disorders of ev function of colon evacuation basis of this phenomenon, by the coused decline of tone of intestinal wall. A coprostasia develops gradually. The symptoms of increasing obturation intestinal obstruction prevail in a clinical picture.

19. Unreducible hernia.

Complication is most frequent. Hernia from reducible becomes unreducible, that fixed in a hernia sack, and stops to be managed into abdominal cavity.

Reason of clumsiness is an adhesive process between contents of hernia and its sack. Connections develop as a result of trauma of hernia contents at setting, by an adhesions. Distinguishes unreducible hernia the important symptom of strangulated, there is a positive symptom of “cough beat”.

The complication of unreducible hernia for the old patients there can be a coprostasis. In basis of this phenomenon there are disorders evacuation functions of colon, conditioned the decline of tone of intestinal wall.

The clumsiness of hernia requires surgical treatment for warning of more threatenings complications.

20. Modern principles and methods of operative treatment of hernia.

Endoskopy interferences with for some time past find more wide application, differing small traumatic and by high enough efficiency, they in most cases became an alternative traditional methods of herniotomy. Laparoscopy hernioplasty was developed in 1989 year (Ger R.). A lot of methods were later offered sufficiently with closing of hernia gate by the special guy-sutures, clips, cylinders of polypropylene and nets. An operation is executed from intraperitoneal or extraperitoneal access.

Intensity of postoperative therapy depends on the term of jamming, expressed of intoxication, presence or absence of necrotizing changes in the jammed organ. If there are not complications of patient write on 7-8 days, at recurrent and postoperative hernia – on 12-15 days after an operation.

21. Prophylaxis of hernia.

1. Regular going in for sports
2. A fight is against obesity;
3. Early exposure of people which have hernia and directions of them on an operation to development of complications;
4. To conduct the prophylactic reviews of population.

Omphalocele: An omphalocele is caused by an opening (defect) in the middle of the abdominal wall at the bellybutton (umbilicus). The skin, muscle, and fibrous tissue are absent. The intestines protrude through the opening and are covered by fine membranes. The umbilical cord is in the center of the defect. An omphalocele is commonly associated with other birth defects (such as heart defects) and with specific genetic syndromes. Omphalocele is diagnosed with prenatal ultrasonography.

Surgical closure is the treatment of choice. However, the skin of the abdominal wall must often be stretched before surgery so there is enough tissue to cover the opening. Large defects sometimes also require skin flaps.

Gastrochisis: Gastroschisis is an abnormal opening of the abdominal wall, usually to the right of the umbilicus, which allows the uncovered intestines to spill out (herniate). The defect is diagnosed with prenatal ultrasonography. In gastroschisis, the bowel may be damaged by compression and by exposure to amniotic fluid. Surgical closure is the treatment of choice. Large herniations may require the creation of a "silo," in which the exposed bowel is wrapped in a protective covering and suspended above the baby for several days or weeks. The silo is gradually compressed, forcing the intestines back into the abdomen.

5. Additional materials for the self-control

A. Clinical cases

Case 1. In a 21-day old child during urination the urine simultaneously flows from the umbilicus. During introduction of indigocarmin into the umbilical fistula the urine turns dark blue. Your diagnosis and tactics?

Case 2.2 days ago the parents of a 1 month girl noticed in the right inguinal area a 1,5×1 cm, not painful tumular formation of a round form, not inlayable into the abdominal cavity . The state of the child is satisfactory. Your diagnosis and tactic?

Case 3. A 3 year-old boy was hospitalized in the surgical department with complaints on the pain in the right inguinal area, vomiting, increase of temperature to 38^0C. He has been ill for about twenty-four hours. At the examination : the state is grave, the pulse is 120 beats per minute, the tongue is dry, the abdomen is distended. During the palpation the abdomen is tense and painful in the lower regions. There was no emptying and gases. In the right inguinal area there is protruding of 4x3 cm, which is densely-elastic, sharply painful, not inlayable in the abdominal cavity. What diagnosis have you made? What tactics have you developed?

B. Tests

6.LITERATURE FOR STUDENTS

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