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Local guidelines on topic:

Clinical anatomy of the upper digestive tract. Endoscopic diagnosis of diseases of the esophagus, stomach and duodenum.

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Endoscopically, the esophagus has the view of a tubular formation which stretches from the inlet (16-18 cm of the incisors) to the gastroesophageal junction: 40-42 cm in males 38-40 cm in females. The first 4-6 cm (the cervical part) – is the closed lumen of the esophagus, it can be disclosed through the insufflation of the air. The folds are easily unfolded during bloating. More distally (the thoracic part), the lumen is open during inhalation and closed during exhalation. At the distance of 25-27 cm of the incisors they note a constriction as a consequence of transaction with the aortic arch and left primary bronchus. More caudally, once can observe rhythmical passive constrictions caused by heart's contractions, the lumen of the esophagus has an oval form. The mucous membrane is pale-pink, smooth. In response to a contact with the endoscope, there contract circular muscles – secondary peristalsis. In the depth of the distal part there is a hiatal (diaphragmatic) constriction. In the opening of the inferior esophageal sphincter 1.5-2cm downwards, there is the Z-line - the border between the plane epithelium of the esophagus and the cylindrical epithelium of the stomach. In norm, it is located over the anatomical gastroesophageal junction and can be asymmetrical.

Esophagitis is a damage of the mucous membrane of the esophagus which has an inflammatory-degenerative nature with the subsequent retraction of the deep layers of the esophageal walls. More often, one can come across secondary esophagitis which accompanies diseases of the esophagus and other organs.

Reflux-esophagitis is the most common type of esophagitis which is present in 40% of patients with gastroesophageal reflux disease (GED)**.** It is a result of the getting of the intestinal contents to the esophagus. The basic cause is the hypotony of the inferior esophageal sphincter. The other causes: the hernia of the esophageal foramen of the diaphragm, the disturbance of gastric peristalsis and the duodenum – ulcer disease, pyloroduodenal stenosis, cholecystitis, obesity, postoperative state (resection of the stomach, esophagogastrostomy, gastroectomy and others).

The diagnosis of reflux-esophagitis is made in the presence of defects of the mucous membrane, 'small changes' – erythema, edema, slight traumacity

(Genwald Consensus, 1999). In some cases, there occurs the replacement of the multi-layered plane epithelium of the esophagus for the single-layered cylindrical one of the gastric type. This disease got the name of 'Barret's esophagus'. It is referred to precancerous diseases.

The diverticulum of the esophagus is a blind restricted convexity of the wall of the esophagus of the congenital or acquired character. The wall of the true diverticulum contains all the layers which possess the wall of the esophagus. The false diverticula are the convexities of the mucous and submucous membranes through the openings in the muscular layer. Diverticula can be single and multiple. After the mechanism of emergence they are divided into pulsatile and tractionary. The pulsatile diverticula are a result of increased pressure in the lumen of the digestive tract with the simultaneous weakening of its wall. The tractionary diverticula are the consequence of 'stretching' from the outside in inflammatory and cicatricial processes.

After their form, diverticula can be: spherical, oval, fusiform and sacciform.

After their topography diverticula can be:

1) pharynxoesophageal;
2) epibronchial (bifurcative, parabronchial, upper-thoracic);
3) epiphrenal (supradiaphragmatic, lower-thoracic).

The complications of the esophageal diverticuli: divericulitis, perforations, hemorrhage, perforations, obstruction of the esophagus, malignization, aspirational (pneumonias, bronchitises, bronchoectases, abscesses of the lungs, gangrene of the lungs, asphyxia).

Esophageal varicose veins dilatation – is the uneven dilatation of esophageal venous trunks with the development of reactive changes in surrounding tissues. The most expressed changes are marked in the lower third of the esophagus and the cardiac part, where the venous trunks are located subepithelially. In the examination, against the background of the inflammation of the mucous membrane varicose veins are seen as deep bands. The number of the truncs is 1-4.

Endoscopically: intraepithelial veins dilate and are marked as red signs (red band, cherry-red spots, hematocystic spots, teleangioectasias). All of them are located immediately on the varicose dilated esophageal veins. The diagnostic and prognostic endoscopic criteria related to the relapse of hemorrhage out of the varicose dilated esophageal veins are their sizes, colour and presence of red signs. The white colour of the venous wall testifies to a thicker wall than the blue colour has. Correspondingly, blue veins give hemorrhage more often. Red signs point out to the increased risk of the development of hemorrhage out of the vein.

Chronic gastritis – is a clinico-anatomical concept which is characterized by certain pathomorphological changes of the gastric mucous membrane**???** a non-specific inflammatory process.

The visual evaluation of the state of the gastric mucous membrane coupled to aimed biopsy and the possibility of the application of different strainers allow to differentiate exactly enough forms of gastritis, define their spread and the phase of disease.

The basic endoscopic signs on which diagnostics is based.

The nature of folds. The folds of the mucous membrane of the stomach are typically unfolded with the air. Only in expressed edema and infiltration of the mucous membrane they have a thickened look at the beginning of insufflation.

The colour of the gastric mucous membrane. In norm, the gastric mucous membrane is pale or pale-pink; in inflammation it attains the colour of different shades and intensity. Sometimes, more often in the antral part, there appears hyperemia against the pale background.

The appearance of the mucous membrane. If the areas of the changed colour alternate with the normal ones, the mucous membrane attains a bright mosaic appearance. On it one can often observe half-round formations which are elevated above the surface with the diameter of 0.2 to 0.3 cm. They can be single or cover totally the surface of the mucous membrane. The latter, in this, looks granular. ‘Granularity’ is often encountered in the antral part and in the

gastric body at the greater curvature. The inflamed mucous membrane looks pastose**,** dark, friable, easy to injure.

The vascular pattern. It can be especially clearly seen in the ordinary bloating of the stomach with the air against the background of the pale mucous membrane in atrophic gastritis. The thickenings of the mucosa testify to the inflammation of the mucous membrane. They can be of different nature: transparent, foamy, white or stained with the bile, turbid, sometimes with fibrinoid thickenings which are difficult to wash away with water.

1. ***What walls does the true diverticulum contain?***
2. ***What are false diverticula?***
3. ***How are diverticula classified by topography?***
4. ***What complications of diverticula do you know?***
5. ***What are the basic endoscopic??? on which chronic gastritis is based?***

Reflux. During the investigation one can observe a reflux of the gastric contents into the esophagus or a reflux of the duodenal contents (bile) into the bulb of the duodenum or the stomach – acute-esophageal, duodenobulbar and duodenogastric refluxes.

Atrophic gastritis is characterized by the thinning of the mucous membrane, visual enhancement of the vascular pattern, diminishing of the folds' sizes. The mucous membrane attains the pale-grey colour. The expressiveness of the endoscopic pattern depends on the degree of atrophy and the spread of the process on the gastric mucous membrane.

In moderately expressed atrophy, wider areas of an insignificantly thinned mucous membrane alternate with small fields of cavities of the pale-grey colour of different configuration. There emerges the so-called 'false' hyperemia (against the background of pale areas of atrophy a normal mucous membrane looks hyperemic).

In an steeply expressed atrophy, the mucous membrane is steeply thinned, with vessels which are translucent, of the grey colour, in some places with a

cyanotic shade, it is easy to injure, the folds are about to disappear. In the histological investigation of the material, as a rule, they reveal intestinal metaplasia.

Congestive gastropathy (hypertrophic gastritis). The most characteristic feature is the enlargement of the mucous membrane. In the given type of gastritis, it would be more correctly to speak of the hyperplastic process.

The enlarged volume of the mucous membrane leads to the increase of the height and thickness of the folds. They attain a twisting look. Between the enlarged folds there form clusters of mucosa which against the background of the expressed hyperemia of the mucous membrane can be evaluated as an ulcerative crater.

A distinctive peculiarity of this type are gastropathy and the presence of the diffuse hyperemia of the mucous membrane which is a differentiational-diagnostic criteria of its difference from the polyposis of the stomach. The concluding diagnosis can be confidently made in the histological investigation of bioptic material.

6. ***What is congestive gastropathy?***

7. What is the distinctive peculrarity of congestive gastropathy?

Menetrier's disease – occurs rarely. This disease is characterized by massive foveolar hypertrophy **of** the folds of the gastric mucous membrane.

The folds increase their volume to the extent that their apexes touch each other closing completely the gastric lumen.

In the lumen and between the folds, there is a large number of the viscose secret of the turbid-white colour. On the folds there not infrequently appear fibrin films. In morphological investigation, they reveal the congenital hyperplasia of the superficial epithelium, rebuilding of the glandular apparatuses with the emergence of a great number of cells which **decrete** mucosa as well as the signs of generalized inflammation.

The etiology and pathogenesis of Menetrier's disease have been studied not enough. The given disease is the precancerous state.

The ulcerative disease of the stomach and duodenum. After its spread, it occupies the second place among all the gastric diseases. The ulcerative disease (peptic ulcer) of the stomach and duodenum is a chronic relapsing disease the course of which is accompanied by periods of exacerbation and remission, at the basis of which there lies the inflammatory reaction of the organism with the formation of the local injure (ulcer) of the mucous membrane of the upper parts of the gastrointestinal tract as a response to the disturbance of the endogenous balance between local factors of protection and aggression.

From the point of view of the nosological separation they differentiate the ulcer disease of the stomach and that of the duodenum. **???**Helibacterpylori associated and non-associated, medicamentous and symptomatic gastroduodenal ulcers.

Statistically, ulcers affect more often the small curvature (40-45%), pyloric and prepyloric parts (38-45%). Far less frequently (8-10%) – the upper parts, anterior and posterior walls (3-5%), very rarely – the bottom and large curvature (0.1-0.2%).

The most widely spread classification is that by Johnson (1965), according to which they single out:

- the 1st type of ulcers – ulcers of the small curvature of the stomach (3cm above the pyloris);
- the 2nd type of ulcers – combined ulcers of the stomach and duodenum;
- the 3rd type of ulcers – of the prepyloric part of the stomach (not farther than 3 cm from the pylorus) and pyloric channel.
- They sometimes single out the 4th type – the ulcer of the duodenum.

  After the number of ulcerative injuries, they differentiate ordinary (more often) and multiple ulcers. They single out ulcers of small (up to 0.5 cm in diameter), middle (0.6-1.9 cm in diameter), big (2.0-3.0 cm in diameter) sizes, as well as gigantic (over 3.0cm in diameter).

The basic complications of ulcerative disease: hemorrhage, peroration, penetration, malignization, ulcerocicatricial stenosis.

At the stage of exacerbation ,chronic ulcer has a rounded or oval form. The edge of the ulcer on the cardiac side elevates over the bottom of ulcer, the edge of the ulcer on the side of the pylorus is most often smoothed, sloping**.** The periulcerous shaft enlarges at the expense of edema as a result of which the crater of the ulcer deepens visually. The bottom of the defect is covered with fibrin of the yellow-grey colour. The mucous membrane around ulcer is hyperemic, edematous, or, sometimes, not changed.

The endoscopic pattern of ulcer being exacerbating is characterized by the diminishing of the hyperemia of the mucous membrane around **???**and the decrease of the peripheral inflammation. The inflammatory surrounding of the ulcer is smoothed, diminishes, the ulcer becomes less deep, the bottom of the ulcer is cleaned up and covered with granulations. In recurrent gastroscopy, at the site of the former ulcer they reveal a less hyperemic area of the mucous membrane - the stage of 'a red scar'. Subsequently, there form retractions of the wall and there appears a connective tissue scar of different forms – the stage of 'a white scar'.

The histological investigation of the bioptic material taken from the edges of the ulcerative defect is also necessary.

8. What is the ulcerative disease of the stomach?

9. What does Johnson's classification include?

10 .What are the basic complications of ulcerative disease?

????11. How does chronic ulcer at the stage of exacerbation?

12. What are the stages of the exacerbation of ulcer?

- ***The differential diagnostics of chronic ulcers and malignant*** **ulceration!!!**

Benign ulcer	**Malignant ulceration**
The form – more often oval or round, less often –linear, fissure-like	The form – irregular, polygonal (amoeboid**)**
The edges are smooth, distinct , evenly separated from the surrounding mucous membrane	Unevenness, the absence of **the edges'** distinctiveness
The absence of the **infiltration** of the surrounding mucous membrane	**Polypoid thickenings of the surrounding mucous membrane**
The same **staining** of the edges and the mucous membrane which surrounds the ulcer, often hemorrhagic (submucous) spots	The bright-red colour of the edges and pale, sometimes greyish-mat **staining** of the surrounding mucous membrane
The bottom is smooth, often covered with thickenings of the yellow or grey colour.	**The bottom** is uneven, humpy, can be flat, sometimes with the whitish crystal-like incrustation which is not infrequently considered to be a cluster of barium
The bottom and edges of the ulcer are sharply separated from each other along the whole diameter **Bleeding sickness** is more	**The bottom** and edges are unevenly and irregularly restricted, in one area there can be the pattern of 'being burrowed' of the edge, and in another – that of 'influx' of tissue onto the edge of ulceration **Bleeding sickness** is more often from the edges of the ulcer

often from the bottom of the ulcer **The convergence of the folds** of the mucous membrane to the ulcer can be seen along the whole circumference. **The deformation of the wall** in the area of the ulcer occurs often enough but has a more limited nature, not infrequently is accompanied by the retraction of the wall in the area of the ulcer (the appearance of 'a hipped roof ') **'Fragmentation'** is not characteristic. In aimed biopsy, the rigidity of the edges of the ulcer is seldom marked	---------- **The diffuse infiltration** of the gastric wall in the area of ulceration with the steady convergence of the folds to one of the areas of the ulceration edge **The deformation of the wall** in the area of the ulcer is sharply expressed and has a diffuse nature – sometimes with the narrowing of the lumen of the gastric cavity in the area of ulceration 'Fragmentation' is characteristic. In aimed biopsy, they note very often the rigidity of the edges of the ulcer

13. Perform/ conduct the differential diagnostics of chronic ulcers and malignant ulceration.

The endoscopic diagnostics of hemorrhages

- All the hemorrhages are divided into lasting (active) and arrested hemorrhages (those occurred). The types of active hemorrhages (by intensity):
- -streaming – hemorrhages pulsating with a stream;

- massive – intensive delivering of the blood when it is impossible to define exactly the site of hemorrhage on the mucous membrane;
- diffusive: droplet (leakage) – on the surface of the mucous membrane, after washing away with a stream of water, there appears a drop of blood without a clearly expressed defect of the mucous membrane: the flow (leakage) – the blood flows from the site of the wall's injure.
- In the posthemorrhagic period, in endoscopic examination, they single out the signs of the arrested hemorrhage:

1) the presence of unchanged or reduced blood in the cavity of the stomach;

2) a fixed parietal thrombus (clot) – a clot fixed to the injured area of the mucous membrane of the arrested hemorrhage and resistant to washing away;

3) a visible vessel on the bottom of the ulcer as a red hump or a **brilliant** hump on the bottom or edge of the ulcer or being elevated above the surface of its bottom;

?? 4)a flat black spot or dot on the mucous membrane (precipitation of hematine).

The first three signs serve a criterion of a high risk of bleeding recurrence!

The factors of reliable homeostasis. During endoscopic examination, in the lumen of the organ under examination they define the characteristic signs of acute hemorrhage into the lumen of the digestive channel: a slightly changed blood or its derivatives (clots, contents after the type of 'coffee grounds'), as well as visible thrombosized vessels, clots or hemorrhagic coating in the bottom of the hemorrhage source.

In 1994, J. Forest firstly suggested a classification of stigmate's (signs) of acute hemorrhage into the lumen of the gastric tract organs:

F-I (Forrerst-1) – lasting hemorrhage – FIA – streaming hemorrhage; FIB – diffuse hemorrhage.

F-II - hemorrhage occurred (arrested): FIIA - a thrombosed vessel (red, black, white);

FIIB - a fixed clot; FIIC – fine thrombosed vessels (red, black dots)

F-III – the signs of hemorrhage are absent (the bottom of the defect of the mucous membrane is covered with fibrin).

After the literature data: the frequency of the recurrence of hemorrhage in F I A males almost 90%, in F I B – 50%, in F II B – 20%; in F II C – less than 5%, in F-III - **more than 5%.**

In this connection, the tactics of the patient's treatment depends to a great extent on the endoscopic characteristics of the hemorrhage source.

In F-I it is indicated to apply active methods of endoscopic homeostasis or performing surgical intervention. In F-II there is some risk of the hemorrhage recurrence; in this, the largest probability of it is noted in F-IIB and F-IIA. The given category of patients are indicated the performance of complex conservative treatment or performing a delayed operation.. Any recurrence of hemorrhage is almost never observed in F-III. That is why these patients are indicated the performance of precancerous and restorative therapy.

The factors of reliable homeostasis: fibrinous coating in the bottom of the ulcer, steady dynamics, the absence of the data that testify to the disturbance of peripheral circulation (microcirculation). The most frequent causes of acute hemorrhages into the lumen of the digestive channel are chronic gastric ulcer and the ulcer of the duodenum.

14. Enumerate the factors of reliable homeostasis in chronic and acute ulcers?

15. What stages of hemorrhages does the classification after Forrest include?

The characteristics of the basic ways of endoscopic hemostasis:

I. Physical (the main mechanism of their action is boiling and coagulation of a bleeding vessel, stimulation and the of creation conditions for thromboformation:

1) diathermocoagulation (monopolar, bipolar, multipolar, hydro-diathermocoagulation);
2) thermocoagulation (criocoagulation, thermocoagulation);
3) laser coagulation;
4) argon plasma coagulation;

5) radiowave coagulation;
6) electroexcision of polyps.

The sphere of the application of the physical methods of hemostasis: hemorrhages out of chronic and acute gastroduodenal ulcers , angiodisplasias of the mucous membrane, bleeding polyps and tumours, disruptions of the mucous membrane. The effectiveness of physical methods makes 72-07%.

II. Mechanical (the mechanism of action is the squeezing of bleeding vessels and creation of conditions for thromboformation):

1) infiltration (injections of physiological solution, medical glue);
2) clipping;
3) ligating;
4) combined infiltration (injections of physiological solution, epinephrine of adrenaline, procoagulants).

The sphere of the application of the mechanical methods of hemostasis: hemorrhages out of chronic and acute gastroduodenal ulcers, angiodisplasias of the mucous membrane, disruptions of the mucous membrane, hemorrhages out of the varicose dilated veins of the esophagus).

All the described above methods of endoscopic action on the source of hemorrhage can be applied separately – as independent methods, most often, one has to use combined methods. The experience shows that a combination of different methods gives the highest percentage of arresting lasting hemorrhage, it is also effective in terms of the prophylaxis of hemorrhage's recurrence.

16. What basic mechanical ways of endoscopic hemostasis do you know?

17. Where and how are the mechanical methods of endoscopic hemostasis used?

III. Medicamentous:

1) epinephrine or adrenaline (the mechanism of action – vasoconstriction);
2) sclerosants (the mechanism of action – chemical coagulation).

Medicamentous methods are effective, economically and technically accessible of all endosurgical methods. Their application does not depend on the nature, localization of the source of hemorrhage and localization of a vessel.

The sphere of the application: hemorrhage out of chronic and acute gastroduodenal ulcers, angiodisplasias of the mucous membrane, bleeding polyps, disruptions of the mucous membrane, the varicose dilated veins of the esophagus).

Fibroesophagogastroduodenoscopy

By today, once can confidently assert that fibroesophagogastroduodenoscopy is the basic method of the diagnostics of diseases of the digestive tract upper parts. In this, one should remember that endoscopy is an invasive method of diagnostics and can be accompanied by certain complications, that is why it is necessary that a risk of possible complications would not exceed the usefulness of investigation.

Indications:

The diagnostics of all possible diseases of the upper parts of the digestive tract (inflammatory **non-specific diseases, ulcerative disease of the stomach and duodenum, hemorrhages, stenoses, Mallory-Weiss syndrome**, Dieulafoy's lesion**, benign and malignant neoplasias, the state of the major duodenal papilla etc.);**

- the differentiation diagnostics of the given diseases;

- the postoperative state of the gastric tract organs;

- hemorrhages of various etiology which need diagnostics and timely endoscopic intervention

Contraindications:

- severe general state of the patient (low arterial pressure, shock etc.);
- cardiopulmonary decompensation;

- severe mental disease.

The methods of performing fibroesophagogastroduodenoscopy

1. Anesthesia. The purpose of anesthesia is to make the investigation which is unpleasant to the patient an acceptable one. For this, they use anesthesia of the fauces and the pharynx with local anesthetics (lidocaine, trymecaine, pyromec, dicaine). The ways of introduction- spraying, gargling of the nasopharynx). Premedication: with the solution of promedol 1 ml 2%, the solution of atropine 0.5 ml 0.1%, seduxen 2 ml i/m, propofol.

2. The position of the patient. On the left side, the left hand – behind the back or bent and the forearm with the hand are located on the frontal abdominal wall. Under the patient's left cheek there must be a pillow-roll or a towel. Under the mouth's left corner – a tray. In case of necessity the right hand is used for intravenous injections.

The basic rules in performing investigation:

1. The advancement of the apparatuses - only under visual control.
2. The forceful advancement of the apparatuses and tools are inacceptable.
3. The performance of investigation is going on after the plan, without stopping at a revealed pathological substrate.
4. After finishing the examination of all the parts – to turn back to the pathological focus for its detalization, biopsy etc.
5. In urgent cases, one should first perform treating endoscopic intervention, and then continue the investigation after the plan. After that – to turn to the pathological focus and assess the effectiveness of the treating intervention.

18. Describe the procedure of fibroesophagogastroduodenoscopy.

19. Formulate the basic rules of performing fibroesophagogastroduodenoscopy.

INDICATIONS AND CONTRAINDICATIONS FOR FIBROBRONCHOSCOPY (FBS). PREPARATION OF A PATIENT. EQUIPMENT.

FBS – is the investigation of the lower air ways with the help of a special instrument – bronchoscope including the examination of the trachea and bronchi as well as the performance

of different diagnostic and therapeutic manipulations.

REMEMBER!!! FBS must be performed after x-ray investigation.

The indications for urgent FBS:

- status asthmaticus is performed with a hard bronchoscope or with a flexible one under narcosis;
- pulmonary hemorrhage /performed with a hard bronchoscope/;
- asynchronicity of the patient's breathing with the apparatus of artificial pulmonary ventilation (???); искусственной вентиляции лёгких
- foreign bodies;
- obstruction of the air ways with tumour or sputum;
- hemoptysis;
- trauma of the breast when there is a suspicion for the trauma of the trachea and bronchi;
- asynchronicity with artificial pulmonary ventilation.

1. What are the indications for planned fibrobronchoscopy?

The indications for planned FBS:

- central and peripheral tumour of the lungs (benign and malignant) revealed in R-grams. For the verification of diagnosis visually and morphologically;
- bronchostenoses and bronchoectases of unclear etiology – the examination of significantly curved bronchi;
- inflammatory processes accompanied by segmental and subsegmental atelectases or infiltrates;
- ???chronic non-specific diseases of the lungs;
- chronic suppurative disease of the lungs /searching for bronchi draining abscesses of the lung;
- hemoptysis;
- fine foreign bodies uncalculated into subsegmental or more distal bronchi;
- disseminated diseases of the lungs;
- suspicion for tuberculosis;

- tumours of the mediastinum;
- diseases of the pleura;
- assessment of the state of the bronchial stump after operation.

The indication for the performance of FBS is the change of the nature of cough in a smoker+cough over 1 month against the background of intensive therapy.

In America:

- cough over a month, incorrigible;
- change of the nature of cough in a smoker;
- hemoptysis;

2. What are the absolute and relative contraindications for fibrobronchoscopy?

The contraindications for FBS:

absolute:

- acute stage of myocardial infarction;
- acute stage of stroke;
- pre-status asthmaticus;
- extremely severe state of the patient.

Here the doctor is oriented at the patient's feeling, the dynamics of ECG etc. FBS can be performed in 2 months;

-intolerability of anesthetics (to do under narcosis);

- stenosis of the pharynx (is not a contraindication for FBS through the intubation tube, tracheostoma)

relative:

- fever not related with the pulmonary process – to postpone for several d;
- the patient's state when FBS doesn't solve anything;
- stenosis of the pharynx is not a contraindication either.

3. What are the indications for planned and urgent therapeutic investigation?

Therapeutic FBS

The indications for planned therapeutic investigations:

-CSDL (chronic suppurative disease of the lungs);

- foreign bodies;

- hemoptysis and pulmonary bleeding;
- tumours of the trachea and large bronchi;

- bronchial fistula;
- status asthmaticus;
- stenosis of the trachea and large bronchi;
- failure of the bronchial stump

The indications for urgent therapeutic investigations:

- changes in the patients undergoing artificial pulmonary ventilation;
- pulmonary bleeding;
- status asthmaticus;
- foreign bodies (needles, nails etc).

ENDOSCOPIC ANATOMY AND PHYSIOLOGY of ??? *TRACHEOBONCHIAL TREE*

The trachea is a cylindrical tube squeezed from the front backwards. It starts at the level of the VI cervical vertebra and ends at the level of the V thoracic one.

The length is 12 cm.

The diameter is 17-19 mm. Contains 15-20 tracheal rings (maximum up to 26).

In children, the trachea starts at the level of the IV-V cervical vertebrae, bifurcation at the level of 3-4 thoracic vertebra.

From the outside the trachea is covered with:

- a connective tissue compartment – adventitia.

Then by layers:

- the fibrocartillaginous layer;
- the muscular layer;
- the submucous membrane;
- the mucous membrane.
- the frontal and lateral walls of the trachea and large bronchi are represented by cartillaginous rings with ligaments.

The back wall is soft, the membranous part.

Te cartilages occupy two thirds of the circumference and represent the framework preserving the lumen. The membranous part is represented by the muscular layer and fibrous tissue.

In the submucous layer there are:

- blood and lymphatic vessels;

- lymphoid follicules;

- alveolar-tubular glands working out protein mucous viscous secret.

The largest glands are above bifurcation and in the main bronchi. The excretory ducts of the lungs open in the lumen of the bronchial tree by flask-like dilatations (in their involvement in the inflammatory process, the diseases last very long).

The blood supply of the trachea – the inferior thyroid arteries and bronchial arteries. Innervation – vagus and recurrent laryngeal nerves.

The angle of bifurcation – 70 degrees (at the level of the fifth thoracic vertebra).

The right primary bronchus – the length 1-4 cm, the diameter 12-16 mm.

The left primary bronchus – 5 the length 5-7 cm, the diameter 10-14 mm, leaves the trachea

at an almost right angle .

4. Describe the segmental structure of the lungs?

A segment of the lung - an area of the lung being ventilated by a segmental bronchi with its artery and vein.

On the right – 10 segments and 3 lobes (superior, median, inferior).

On the left – 8 segment and 2 lobes – superior (superior and inferior)

Upper lobular bronchus on the right is divided into 3 segmental bronchi:

- apical B1.
- posterior B2
- Frontal B3

Median lobular bronchus on the right is divided into 2 segmental bronchi:

- lateral B4;
- - medial B5.

Lower lobular bronchus on the right is divided into 5 segmental bronchi:

-apical B6 (Nelson's bronchus, Fowler's apex);

-mediobasal B7 (cardiac);

-frontobasal B8;

-laterobasal B9;

- posteriobasal B10.

Upper lobular bronchus on the left is divided into 2 branches:

- upper, which, in its turn, is divided into 2 segmental bronchi;

- apicoposterior B1-2 (common);
- frontal B3;

Lower which, in its turn, is divided into 2 segmental bronchi:

- upper uvular B4;
- lower uvular B5.

Lower lobular bronchus on the left is divided into 4 segments (as a rule, no B7):

- apical B6;
- frontobasal B8;
- laterobasal B9;
- posteriobasal B10.

On the right 4 areas are singled out:

1. upper lobe – upper area, bronchus upper areal.
2. middle lobe – frontal area, bronchus – frontoareal.
3. B6 – posterior area, bronchus – posterioareal.
4. 4 basal segments on the right – lower area, bronchus – lower areal.

On the left – also 4 areas:

1. upper branch of the upper lobular bronchus – upper area.
2. bronchus – upper areal, lower branch of the upper lobular bronchus – frontal area, bronchus frontoareal.
3. B6 – posterior area of bronchi – posterioareal.
4. # basal segments on the left – lower area, bronchus – lower areal.

Preparation of the patient

1. It is necessary to explain to the patient the necessity of the forthcoming procedure characterize its basic stages.
2. To specify the mental state of the patient, the degree of his anxiety. In case of need, prescribe a tranquilizer for night (diazepam, tazepam, redanium, pax).
3. Heavy patients should be examined by the doctor which is supposed perform FBS.
4. The anamnesis. should include:

- general blood test;
- general urine test;
- blood group and r-factor;

- time of coagulation;
- ECG .

-Roentgenograms : direct and lateral tomograms.

5. The stomach should be empty, consequently, the patient is going to investigation fasting. If the patient has got the concomitant stenosis of the pylorus, it is necessary to lavage the stomach.

5 .How is the premedications and anesthesia of the patients before FBS performed?

PREMEDICATION AND ANESTHESIA

30 minutes before the beginning to perform local anesthesia, the patient is injected 1 ml of 0.1 solution of atropine subcutaneously to eliminate vagus influence.

In patients with glaucoma investigation is performed without preliminary atropinization.

The patients who tend to bronchospasm 15 before investigation are injected intravenously 10 ml of 2.4% solution of euphilline per 10 ml of physiological solution, and immediately before the beginning of local anesthesia they are given 1-2 doses of aerosol of asthmopent, ,salbutamol, atrovent or alupent.

For the anesthesia of the upper air ways and pharynx they use:

-1% solution of licaine;

-2% solution of lidocaine;

-4 solution of xylocaine.

Imposing them on the mucosa with the help of a spray.

In transnasal introduction of the endoscop , the anesthesia of the nasal meatus is performed in the application way. The anesthesia of the vocal cords is performed through the catheter introduced through the channel of the bronchoscope. The anesthesia of the mucous trachea and bronchi is performed with the 4% solution of trimecaine – b-1- ml or the 0.5% solution of dicaine – 3-5 ml.

The primary reflexogenic zones are thoroughly anesthetized:

- bifurcation of the trachea;
- spurs of lobular and segmental bronchi.

Anesthesia is performed per 0.5 ml with the interval of 30 sec.

The minimum time for performing anesthesia – 10 mm.

The sufficiency of anesthesia – when the vocal cords are touched, they do not close up+no cough..

-lidocaine for the whole anesthesia – 10 ml.

- the best combination: dicaine_trimecaine, dicaine - up to 5 ml.

- anesthesia with xylocaine only for the nasopharynx, afterwards continue with trimecaine.

REMEMBER !!! Anesthetics should be warm.

And only in the presence of hemorrhage – cold.

6. What apparatuses and instruments are needed for FBS?

THE APPARATUSES AND INSTRUMENTS FOR FBS

For performing FBS, it is necessary to have:

- a comfortable armchair with the elbow-rest, it is OK when it is like prosthodontic;
- fibrobronchoscope;
- a source of the light;
- appliances for diagnostic and therapeutic manipulations;
- a stand from under a dropper.

The modern fibrobronchoscope has the general length of 760 mm, the working length – 550 mm. The external diameter of the tube being introduced is 6 mm. The range of the angle of the curve of the distal end is 180o upwards and 130o downwards. Such a big range ensures

a smooth introduction of the apparatus in not easily accessible areas (for example, the upper

right and left lobe), a deepened examination of subsegmental bronchi.

The diameter of the biopsy channel is 2.8 mm/ which enables to take aspirates freely, perform biopsy and cytology.

There exists a therapeutic fibrobronchoscope XT-20 with the external diameter of 6.3 cm, while the internal diameter of the biopsy channel is 3.2 mm, which allows to use instruments of large sizes for:

- large scale biopsy;
- taking large foreign bodies out of the tracheobronchial tree;
- arresting hemorrhages.

The source of the light CLE-10 in which they use for observation a halogen lamp with the capacity of 159 Wt and a flash lamp for taking photos with the capacity of 500 Wt.

The appliances for diagnostics and treatment:

-cytological brushes

-biopsy forceps;

- catching forceps;

- fork laws;

- 'alligator';

- 'rat teeth';

- 'tripod' claw;

-basket;

- magnetic extractor;

- lavage tubes;

- injector;

- surgical scissors;

- anti-shock set.

METHODS OF INVESTIGATION

The patient's position – sitting or lying. Preferable is the performance of investigation in the patient's sitting position.

The endoscope is introduced transnasally.

Perorally – only in the sharp narrowing and deformation of the inferior nasal meatuses.

Anatomical clues:

The 1st anatomical clue – the epiglottis anatomical.

They single out the parts of the larynx:

- upper – as far as the false vocal folds;
- middle – as far as the vocal fissure which is formed by the true vocal folds;
- lower – as far as the lower edge of the cricoid cartilage.

The 2nd anatomical clue – the true vocal folds;

- located under the false one, these are whitish bands, stripes. At their back edge there are arytenoid cartilages. The space between the inner surface of the true vocal ligaments and arytenoid cartilages – the vocal fissure.
- The 3rd anatomical clue – the carina of bifurcation.

  In breathing, it is shifted downwards and forwards by 2-3 cm. In the carina they single out:
- crescent;
- anterior and posterior triangles.

  Endoscopically: the mucosa of the anterior triangle is lighter than the posterior one, and its size is bigger.

  The carina can be:
- sharp;
- flattened;
- saddle-likely curved;
- S-like.

7. What should one remember in the examination of the bronchi in the process of FBS?

Remember!!!

The examination starts with that side of the bronchial tree where the changes are less expressed (which is preliminarily determined after roentgenograms).

If the changes are expressed on both sides equally, the examination starts with any half of the bronchial tree (usually on the right).

On the right, they primarily examine the upper lobular bronchus which leaves outwards and upwards at right angles. Its diameter is 8-10 mm.

From the lower border of the mouth of the upper lobular bronchus there starts the intermediate bronchus which ends at the level of the mouth of the middle lobular bronchi. Its length is 2-3 cm, diameter 10-11 mm.

The middle lobular bronchus leaves the frontal service of the intermediate bronchus. It is narrow, long, leaves at acute angles – a frequent localization of pathology. The length 102 cm, diameter – 7 mm.

After leaving the middle lobular bronchus, the lower lobular bronchus starts. It is short, hard to determine. Its back surface – downwards, backwards and laterally – is

left by Bb-diameter up to 10 mm; it is divided intp 3 subsegmental bronchi. Furthter, the lower lobular bronchus is divided into 4 basal bronchi.

On the left, the examination starts with the basal bronchi and their finer branches, then they examine B6 and its subsegmental branches, then the uvular and upper lobular bronchi and their segmental and subsegmental branches.

On the left, the mouths of the upper lobular and lower lobular bronchi are practically located at the same level and separated by a distinct spur.

The left upper lobular bronchus leaves the frontal surface of the primary bronchus upwards and outwards: it is divided into 4 segmental bronchi.

The lower lobular bronchus on the left leaves the back surface of the primary bronchus and is divided into 4 segmental bronchi.

METHODS OF BIOPSY IN FBS.

I. ASPIRATIONAL /transbronchial, transtracheal/.

Indications:

- tumours of the mediastinum of unclear genesis which are localized near the bronchus;
- all the diseases of the respiratory organs accompanied by the enlargement of the mediastinal lymphatic nodes.

Conduct the needle under visual control. Puncture is performed along the right lateral descent of the trachea, having stepped aside the carina 0.5 cm, or through the carina, or along its left descent.

The syringe and needle are completely dry. The material should be taken in with effort. The needle is plunged by 1 cm into the wall. The absorption of the material is slow. In taking out the needle absorption continues. Then smears are done onto the absolutely dry glass.

II. Forceps:

Is taken out of any exophite tumours and of spurs of the primary, lobular, segmental bronchi.

REMEMBER!!! It is impossible to take biopsy from the wall with forceps!!!

The diameter of obtained pieces is 1-2 cm. If hemorrhage ever occurs, it is not profuse.

At least 6 pieces are taken. They are fixed in 5% formalin. It is also necessary to make cytological imprints.

III. BRUSH-BIOPSY

It is taken with a brush from the walls of bronchi, that is in endophyte formations of fine bronchi. Several sliding movements are performed, the brush is taken out together with the apparatus. 3-4 smears-imprints are taken.

8. What should one remember after finishing FBS?

REMEMBER!!! After the investigation, the brush is washed with soap solution together with the apparatus, only then the brush is taken out of the bioptic channel.

IV. Sampling the material for inoculation and testing the sensitiveness to antibiotics.

Before the examination, they introduce 10-20 mm of physiological solution into the tracheobronchial tree. Then, with the help of the catheter some amount of the contents is taken in the syringe - in a dry bottle, 2-3 ml are taken in + in a sterile vial. There should be no blood.

V. Target (aimed) biopsy of peripheral formations under x-ray control is performed in an x-ray room.

After x-ray they find out the rough localization of the pathological focus.

In the mouth of the corresponding segment under visual control bioptic forceps are introduced: with the help of an x-ray tele-attachment they define the needed direction, trying to get the instrument immediately to the focus.

A sign of the forceps‘s location by the target - the displacement of the shade at an attempt of the subsequent conducting of the opened forceps + their correct position in a direct and lateral projection in x-ray control. The forceps are slightly pulled towards the surgeon and, staying in the shade, are opened.

The patient is given the command ‘breathe out! Detain breathing!’. Then the instrument is sent forward with the simultaneous closing of the forceps’s branches.

Manipulation is performed being oriented at one’s own tactile sensations+orientation at the position of the forceps.

In x-ray control the traction of the forceps, as a rule, displaces the shade in the proximal direction, while the moment of (???)happens to be seen in roentgenoscopy.

After aimed biopsy, brush biopsy is performed.

VI. TRANSBRONCHIAL BIOPSY OF THE LUNG.

It is performed in disseminated diseases of the lungs. Under x-ray control, introduce the forceps till a slight prick (the patient's sensations). Take away the forceps by 1-2 cm. Conduct biopsy at breathing out. If pain is noted, then the pleura has been touched upon.

The forceps are opened and biopsy is repeated through another bronchus. After sampling the material – brush biopsy.

One should not!!! Conduct the transbronchial biopsy of the lungs in patients with polycystic of the lungs and with an expressed emphysema.

9. Describe complications after FBS.

COMPLICATIONS OF FBS.

They are observed in 0.2%.

By the degree of severity they single out:

- Mild - 0.2%.
- Heavy – 0.08%.
- Fatal – 0.01.
- Besides, they single out the following complications:

1) conditioned by the conductance of local anesthesia;
2) conditioned by the procedure itself and endobronchial manipulations.

A slight increase of the pulse rate and a moderate increase of the blood pressure represent a common reaction in performing FBS.

Complications from local anesthesia.

- toxic action in the overdose of drugs.

The clinical pattern: symptoms of overdose develop very quickly which is conditioned by quick absorption, for example of dicaine, which causes cardiovascular complications up to the heart arrest.

Impacting the cardiovascular centre, one provokes a spasm of the brain vessels. The patient develops weakness, nausea, vertigo, paleness of the cutaneous integument, cold sweat, a frequent low pulse rate.

If the irritation of the brain joins, then there develop excitation, convulsions, fainting.

The treatment:

- to stop anesthesia immediately;
- to lift the lower extremities;

- to let breath in a moistened oxygen;
- to introduce respiratory analeptics;

intravenously:

cordiamine – 2 ml;

caffeine – 2 ml;

bimigrid – 2 ml.

In a decrease of the blood pressure:

- intravenously slowly 0.1-0.3 ml of adrenalin per 10 ml of physiological solution, or 1 ml of 5% ephedrine per 10 ml of physiological solution;
- intravenously streamingly 400.00 of polyglucogen+ 30-120 mg, prednisolone or 50-125 mg of hydrocortisone;

- in heart arrest – close massage, intracordially 1 ml of adrenaline per 10 ml of CaCl with the addition of hormones+ artificial pulmonary ventilation;
- in the irritation of the brain cortex - intravenously barbiturates – 10-20 mg.

ANAPHILACTIC SHOCK develops in intolerance to anesthetics.

The treatment also starts with an immediate stop of anesthesia. The patient is laid down with the elevated lower extremities and allowed to breath in a moistened oxygen.

Intravenously streamingly: 400.0 ml of polyglucogen+1 ml of adrenaline+ 2 ml of 2% suprastin or 2 ml of 1% of diphenhydramine or 2 ml of 0.1% tavegye+ obligatorily 90 mg of prednisolone/hydrocortisone.

BRONCHOSPASM

- Intravenously 2 ml of ephedrine per 20 ml of 40% glucose+10 ml of NaCl+hormones . In the edema of the larynx, stridorous breathing through a mask, they let breathe in the mixture of nitrous oxide with halothane and oxygen before artificial pulmonary ventilation. Prophylaxis: testing individual sensitiveness/anamnesis, performing a trial.

The doses of the preparations must be measured in advance:

- docaine 1% not more than 5 ml;
- trimecaine 4% not more than 15 ml;
- lidocaine 2% not more than 10 ml.

It is possible to add 5 ml of ephedrine drops per 5 ml of anesthetic.

REMEMBER!!! If in the anamnesis there is intolerance to novocaine, dicaine should not be used , it is necessary to perform a local trial for trimecaine.

Aerosole can be only used in the anesthesia of the nasal meatuses and pharynx.

The patient should be quiet.

In the insufficiency of anesthesia there develop spastic vagus reactions manifesting in laryngospasm and bronchospasm.

Laryngospasm develops in the conducting of the apparatuses through the fissure of glottis. The investigation in this case should not be stopped. One should stop above the fissure of glottis and let the patient breath enough –inspiration through the nose, expiration– through the mouth.

Then anesthesia should be added on the fissure of glottis.

Bronchospasm develops more often in patients with bronchial asthma.

It is displayed in:

- expiratory dyspnea/prolonged breathing out;
- cyanosis;
- excitation of the patient;
- tachycardia;
- hypertension;
- sometimes up to convulsions against the background of the hypoxia of the brain.

The investigation should be stopped immediately; the patient should be laid down and allowed to breath in a moistened oxygen. Then let him breath in 2 doses of aerosole, intravenously euphilline 10 ml per 10 ml of physiological solution+ 60 mg of prednisolone. For the prophylaxis of the insufficiency of anesthesia it is necessary to introduce atropine 30 minutes before the investigation.

All the solutions should be warmed up+ a thorough performance of anesthesia.

Complications caused by the procedure of FBS itself and endobronchial manipulations:

- hypoxic , that is the mechanical obstruction of the airways;
- bleeding;
- pneumothorax;
- peroration of the bronchial wall;
- the feverish state of the patient;

- exacerbation of the pulmonary process;
- bacteremia.

Hypoxic complications: develop in patients with initial hypoxemia: it is dangerous of the patient develops additional bronchospasm or laryngospasm. For the prophylaxis of such complications the investigation should be performed. If the patient develops convulsions, then: intravenously by drops – barbiturate/ natrium thiopental/+forced diuresis/by drops 4-5% solution of soda 200-400 ml with the addition of euphilline/+hormones.

Hemorrhages – often from the nasal meatus, especially in hypertensive. The endoscope should be introduced delicately. The most frequent complication – hemorrhage in biopsy, especially from the adenoma of a bronchus or from disintegrating tumours.

Hemorrhage is considered to be a one-moment delivering of over 50 ml of blood.

In this case, it is necessary to stop biopsy, start washing away with cold water – 10-20 ml.

One can locally introduce adraxone -.0025% -1-2 ml – the biggest effect in capillary hemorrhage. It can be dissolved with 1-2 ml of cold water. Also locally aminocaproic acid, dicynon 2 ml.

One ca also use the apparatus by closing the mouth of the small bronchus with it.

If one fails to stop hemorrhage, it is necessary to get down to hard bronchoscopy.

Pneumothorax - develops in taking biopsy from pulmonary tissue. For prophylaxis the –x-ray control of manipulation is obligatory.

The further measures depend on the degree of the lungs collabing:

- if it is for 1/3 – puncture;
- if it is not more than 1/3 – draining the pleural cavity with the interference of active aspiration.

Perforation of the bronchial wall develops in the elimination of sharp foreign bodies.

REMEMBER!!! Turn the foreign body around only above the carina.

The treatment is surgical only.

A feverish state and the exacerbation of the inflammatory process of the bronchi are observed after therapeutic FBS.

The treatment is general only.

Bacteremia – develops as a consequence of the trauma of the mucous membrane against the background of the suppurative process (especially in the presence of GRAMM '_' flora+npn-sterile bronchoscope).

Can lead to sepsis.

PULMONARY CANCER

Men are ill 4 times more often as compared to women. The mortality of pulmonary cancer has increased by 30% during the recent 10 years.

It is believed that chronic obstruction lung diseases are referred to precancer, but it is correct because they are considered background diseases.

10. Give the existing classifications of pulmonary cancer?

Types of pulmonary cancer:

I. Epidermoid cancer – the process starts with the injure of the epithelium which is resulted in:

- atrophy;
- substitution of the glands by fibrous tissue;
- the decrease of the number of goblet cells;
- gradual transformation of the cylindrical epithelium into the flat one;
- there appears the focus of planocellular metaplasia;
- then there develop displasias etc.;

The first lung is damaged in 60% of cases, besides the upper lobe is damaged first, the lower and middle lobe.

Bilateral spreading is rare.

Central cancer appears in the area of segmental bronchi, in this more often – in the middle there are segments of the upper lobes. In pulmonary cancer they observe quick and early metastazing.

After the data of FBS , x-ray and clinical picture it is necessary to find out the stage and morphology of the tumour.

The classifications of TMN:

N0 – no signs of the enlargement of the lymphatic nodes.

N1 – the enlargement of the upper pectoral lymphatic nodes.

M0 – no MTS.

M1 – there are remote MTS or pleural exudate.

T0 – tumour is not defined.

T1 - tumour is restricted by a segmental bronchus.

T2 - tumour is restricted by a lobular bronchus.

T4 - tumour spreads on the primary bronchus.

T5 – tumour spreads beyond the lung.

In 1967 the WHO adopted the histological classification:

I. Planocellular cancer (epidermal).

II. Small cell carcinoma.

III. Adenocarcinoma.

IV. Large cell carcinoma.

V. Combination of planocellular cancer with adenocarcinoma.

After Krayevskiy:

I. PLANOCELLULAR CANCER:

- with cornification (the high degree of differentiation).
- without cornification (the middle degree of differentiation).
- with the low degree of differentiation.

II. GLANDULAR CANCER:

Adenocarcinoma

Slightly differentiated glandular cancer.

III. NON-DIFFERENTIATED CANCER:

- round cell carcinoma;
- oat cell carcinoma;
- polymorphocellular carcinoma .

After SOKOLOV (1956 г):

1. Central cancer.
2. Peripheral cancer (bronchi of 4 and other orders).
3. Apical cancer (Pancost).
4. Mediastinal cancer.
5. Milliary cancer.

It is a manifestation MTS, that is why they single out:

1. Central cancer.
2. Peripheral cancer.

3. Bronchoalveolar cancer.

The clinical picture is diverse and depends on:

- background diseases of the lungs;
- presence of MTS;
- concomitant diseases.

In particular, clinically they observe:

- appearance of backing cough;
- change of the nature of cough;
- increase of temperature up to high figures;
- hemoptysis (in 40-50% it can be the only sign of disease);
- dyspnea;
- fatigue.

By the character of growth they single out:

-endobronchially;

- exophytes (in the lumen of the bronchi);
- endophytes (growth into the wall in the form of infiltrates or ulcers);

-peribronchially.

Exophytes occur most often.

Direct signs of pulmonary cancer in FBS:

EXOPHYITES:

1. Semispherical form:

- on a wide base with a tuberous surface;
- grayish-pink colour;
- sizes are different ;
- but the tumour always narrows the lumen of the bronchus;
- tumour of dense consistency (in taking biopsy - contact bleeding sickness).

2. Resembles a raspberry:

- consists of granulomatous excrescences of the bright-red colour;
- on a wide base;
- very dense. (an expressed diffuse bleeding sickness, even contactlessly).

2. Of an irregular form:

- with uneven, festoon margins;

- a free margin partially or completely (???) the bronchial lumen;
- hyperemia of the mucosa at the base;
- in instrumental palpation the tumour is soft;
- - insignificant contact bleeding sickness.
- ENDOPHITES:
- more often have the form of infiltrate;
- can be placed in the mouth and on the bronchial wall;
- can have distinct contours;
- the form is irregular;

???the surface is rough, slightly lifted above the level of the mucous membrane of the tracheobronchial tree;

- the colouring of tumour does not differ from the surrounding mucosa, but can be brighter or paler;
- at the later stage, infiltrate spreads over the whole bronchus which has the from of a tube and is immobile;
- the vessel pattern is impoverished or somewhere enforced.

The diagnosis reads: Central cancer of the right lung, the endobronchial form of growth.

A rare form of endophytic tumour can be ulcer:

- it is of an irregular form;
- with a tuberous uneven bottom;
- with a dirty-grey film;
- in instrumental palpation the margins are rigid;
- in biopsy there is insignificant contact bleeding sickness.

REMEMBER!!! In any form of tumour – first aspiration biopsy, and then – excisional brush-biopsy and smears-imprints on 5-6 glasses.

The oblique signs of pulmonary in FBS – they are conditioned by the peribronchial growth of tumour:

1. The anatomical signs:

- constriction and deformation of the bronchial mouth;
- the bronchial rings are not differentiated;
- the vessel pattern is changed – the vessels are short, twisted unevenly dilated;

- can be the rough foldedness of the mucous membrane.

2. The functional signs:

- rigidity of the bronchial wall;
- absence of transmitting pulsation.
- the syndrome of 'the dead mouth'- when the secret in the mouth is not displaced by the air which testifies to the obturation of the bronchus below.

The prevalence of the process is testified to by:

- yellowish plaques, tubercles, insignificantly elevated above the surrounding mucous membrane;
- roughness of the mucosa and disorderly foldedness;
-spotty, red-white colouring of the mucous membrane and the obliterated pattern of the cartilaginous rings;
-multiple, not deep, small ulcers;
-disorderly vascular;
-increased contact bleeding sickness of the mucous membrane.

In the presence of at least one sign biopsy is taken into a separately marked flacon.

The form of the carina also changes – extension or its immobility or the carina attains a saddle-like form. In this case, one should think of the presence of MTS and, thus, transbronchial biopsy is needed;

- infiltration of the carina;
- tumour of the mouth of the primary bronchus.

The inoperability of the patient is testified to by the paresis of one or both vocal folds.

Early pulmonary cancer - a tumour with the diameter of under 2 cm without metastases (TNN). In the interference at this stage, the survivability in the course of 5 years in 98% of cases. In Japan, they use a roentgenological-cytological screening-test, the frequency of delectability in the test like this is 74 patients per 200000 of the examined patients.

PULMONARY HEMORRHAGES

Pulmonary hemorrhages are called the states characterized by the excretion of blood out of the air ways during cough.

Hemoptosis – the admixture of blood in the sputum.

Pulmonary hemorrhage:

By degree:

-the 1st degree – loss of blood – 50-100ml.

-the 2nd degree – loss of blood – 100-200 ml.

- the 3rd degree – loss of blood – more 200 ml.

Profuse hemorrhage - the excretion of blood is up to 500 ml/h.

Besides they single out massive hemorrhage – over 600 ml per 24 hours.

11. What tasks are solved by FBS in pulmonary hemorrhages?

The tasks of FBS in pulmonary hemorrhages and hemoptosis:

- to define where hemorrhage goes from (the side);
- to find out the causes of hemorrhage.

The causes:

-tuberculosis;

-pulmonary cancer;

-bronchial adenoma;

-bronchoectases;

-pulmonary abscess;

-hemangioma;

-etc.

It is necessary to differentiate pulmonary hemorrhage from gastric hemorrhage:

A. PULMONARY HEMORRHAGE:

-excreted in cough;

-the blood foams;

-bright-red colour;

-the blood goes on discharging with the sputum in the form of blood streaks during several days;

-blood is always mixed with the sputum.

-melena is absent;

-no anemia, as a rule.

B. GASTROINTESTINAL HEMORRHAGE:

-in nausea;

- in vomiting;

- does not foam;

- blood is mainly dark;

Practically always

There are signs of the anemia of different degrees of severity.

The source of hemorrhage:

A disrupted vessel in tuberculosis when the process spreads over the vascular wall. It is observed in patients with the active form of tuberculosis (BK+)open tuberculosis.

Mycetomes – excrescence of fungi in false cysts and caverns (very often is formed in tuberculous caverns);

Pulmonary cancer - hemorrhages at the late stage in the disintegration of the lung (in 20% pulmonary cancer is complicated by hemorrhage).

In CNDL (chronic non-specific disease of the lungs)– the cause is:

-varicosely dilatated bronchial veins together with the sclerotic changes of the vascular walls;

- there are frequent hemorrhages in patients with bronchoectases;

- and in patients inclined to them (patients with 'dry' bronchoecstases);

- long before aspirated foreign bodies.

12. What should one remember in hemoptysis and pulmonary hemorrhages of different degrees?

REMEMBER!!! In hemoptysis and pulmonary hemorrhage, the 1st -2nd ordinary FBS is performed.

If pulmonary hemorrhage is of the 3rd degree – hardbronchoscopy under narcosis.

In pulmonary hemorrhage they strive to perform FBS as early as possible, because it is easier to define the source (in lasting hemorrhages it is simpler to do).

There must be hemostatics at hand.

In pulmonary hemorrhage of the 3rd degree, hemorrhage can only be arrested temporary. In hard bronchoscopy, they use ordinary tampons and press the vessel, tamponize the bronchus.

They use the Fogarti probe during 10-15 minutes, then they introduce intothe bronchus a sponge of porolone 2-3 times larger in the diameter ???? the lumen of the bronchus ???it is in the form of a ball introduced into the bronchus. They leave it for

48-72 hours. In the failure of the arrest of the hemorrhage, they repeatedly introduce the obturator (up to 10-15 days).

Hemostatic measures in FBS:

- adraxone 0.025% -1-2 ml on a cool physiological solution;
- lavaging the bronchus with cool physiological solution.
- endobronchial laser photocoagulation.