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Faculty of surgery

ACUTE AND CHRONIC PYOTHORAX

Tutorial

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Annotation.

The manual is intended to prepare for practical classes in the Faculty of surgery for the students of the course 4 medical, Pediatric, medical-preventive and dental faculties.

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**Acute and chronic pyothorax**

**1. Introduction.** Empiema is accumulation of pus in the already existing cavity. Acute pleural empyema is limited or diffuse inflammation of the visceral and parietal pleura, proceeding with the accumulation of pus in the pleural cavity and accompanied by symptoms of purulent intoxication and often respiratory failure.

Piopnevmotoraks is a syndrome that occurs when different etiology and pathogenesis of Pyo-destructive lung diseases characterized by pus and breakthrough of air in the pleural space and in the acute period of the characteristic clinical picture.

The severity of the clinical course of acute empiema pleura and piopnevmotoraksa characterizes this pathology as one of the most difficult in thoracic surgery. Acute and chronic empiema (piopnevmotoraks) of the pleura known surgeons as serious complications of injuries and operations on the chest as well as some diseases of the chest. They bring patients extremely heavy physical and mental suffering and often pose a threat to the lives of patients. Despite the significant achievements in the Organization of surgical care to the population, the emergence of acute pleural empyemas occurs more frequently, downward trend in such patients there. Inadequate treatment leads to the formation of chronic empiema pleura (according to domestic and foreign researchers in 4-25% of cases). Treatment of acute empyemas and piopnevmotoraksov remains a difficult task. This is evidenced by the high percentage of mortality in patients with this pathology.

**2. The Etiology of acute empiema pleura.**

Acute pleural empyema is a polijetiologichnym disease. Depending on the etiology of distinguish specific and nonspecific, mixed jempiemu pleura.

Specific empiema pleura is called Mycobacterium tuberculosis, some authors here and are also fungal EP (aktinomikoticheskie, kandidomikoticheskie, aspergileznye). To the specific jempiemam pleura also include and syphilitic Pleurisy.

Nonspecific pleural empyema is caused by different gnoerodnymi or putrefactive microorganisms. Before the use of antibiotics in the PUs of the pleural cavity is most commonly found pnevmokocchi, streptococci and diplokokki. Over the past decade, the ratio of microbial pathogens has changed markedly. Most frequently detected Staphylococcus-up to 77%. This is due to his expressed virulent and resistant to most antibacterials. In 30-45% of cases when the crops of the pleural cavity of pus get height g (-) microorganisms are different strains of Escherichia, Escherichia coli, Proteus. Up to 80% of cases can be sown neklostridialnaja anaerobic Flora (bakteroida, peptokocchi, peptostreptokocchi, Fusobacterium, etc.).

**3. Pathogenesis and necropsy acute empiema pleura**

Pathogenetically distinguish primary and secondary jempiemu pleura.

The first empieme pleura hotbed of inflammation from the very beginning is localized in the pleural cavity, with secondary-it is a complication of some other inflammatory diseases-Pyo.

Primary empiema pleura occurs on the background of unmodified, healthy pleural leaves as a result of infringement of their barrier function with entering microflora. This happens when the chest injury after operations on the lung, as well as in the imposition of artificial pneumothorax.

According to G.i. Lukomskogo, in 88% of cases, a secondary complication was empiema pleura pneumonia, acute and Chronic suppurative lung disease. Pneumonia can occur from the outset with the development of purulent pleurisy (parapnevmonicheskaja empiema pleura, pyothorax or develops on the outcome of pneumonia and is becoming independent of disease (metapnevmonicheskaja).

When abscessah the lung pleural empyema occurs in 8-11% of patients with lung gangrene at 55-90%.

In a few cases, empiema can develop as a complication of nagnoivshejsja or parasitic cyst of the lung cancer, the withering away of spontaneous pneumothorax.

Secondary empiema pleura can evolve and communicable in chest wounds, inflammatory conditions, osteomielite ribs, spine, sternum, hondrite, lymphadenitis, mediastinite pericardite,.

Pleural infection source in rare cases may be acute inflammatory diseases of the abdominal cavity (subphrenic abscess, pancreatitis, holetsistit. etc.). The penetration of germs from the abdominal cavity to the pleura occurs in the lymphatic vessels and interstices in the diaphragm, the so-called "hatches" (enlarged lymphatic vessels), or by hematogenic osteomyelitis.

**Pathological anatomy.** Gnoerodnaja bacterial flora, which in one way or another in the pleural tissues, and then in the cavity plevralnuu, evoke the inflammatory response that has some specific features of the toxins the bacteria produce its irritating effect and cause loss of cellular elements of the pleura and covering of endothelium. Response of vascular reaction to the large surface of the pleura occurs primarily in the form of abundant exudation.

In the initial stage of inflammation, a significant portion of the exudate is absorbed mainly parietal plevroj and the remaining on the surface of the pleura fibrin and extrudible swelling waterstop due to infiltration of kruglokletochnoj endothelial cover make turbid and pleura rough. In situ disappearance of endothelial cover develops granuljacionnaja fabric. As a result of these changes, the absorption of exudates and pleural cavity is filled originally serous, c3b inactivator-fibrinoznym, and then purulent an effusion.

Flakes of fibrin form sometimes massive clumps that settle on the walls of the cavity pleura or exposed necrotic fuse, especially if you have strep or anaerobic infections.

In places where no exudate separates pleural surface and leaves them in contact between them formed fibrinoznye limiting adhesions, which are typically above the upper level of purulent exudate. At the same time, if the patient is in bed in a crouched position, which happens more often than not, these spikes fixed top level purulent exudate in the slanting direction is behind, above, below, go ahead, forming the so-called Damuazo line.

In some cases these adhesions pleural cavity share with exudate on separate sites with the formation of localized and multiple forms of Pleurisy.

Proliferative infiltration, evolved in the pleura, extends to adjacent plots of lung, on the one hand, and on the chest wall, and also penetrates the fibrinoznye formed adhesions. This infiltration goes into granuljacionnuju and fibrous connective tissue with complete isolation of purulent exudate, resulting ultimately in excretion of exudate to complete obliteration of pleural cavity with subsequent recovery.

In a weakened body restricting adhesions is not formed, and purulent exudate fills gradually the entire pleural space, forming diffuse pleural effusion. When the light flows in to the root, the mediastinum shifts in a healthy way and the diaphragm is lowered.

In cases when a localized or diffuse purulent pleurisy in may remains the virulent infection, and inflammatory response progresses, some observations of pus makes its way through the chest wall and under the skin, in others it breaks through the lung tissue and erupts into a lumen of bronchi, and produces internal broncho-pleural fistula, through which the patient vykashlivaet pus.

Purulent pleurisy that form when a bad discharge purulent exudate from the pleural space are taking chronic.

In the event of a breakthrough in the cavity pleura of lung abscess, previous message with the bronchus is piopnevmotoraks, i.e. the occurrence of pleural cavity of pus and air with the development of severe inflammatory process over the entire surface of cover.

Once the patient cope with the acute period of diseases resulting in place breakout abscess or message is closed, or left pleural-bronchial fistula, which supports purulent inflammation. The remaining bronchial-pleural fistula can sometimes be so small that they barely wanted even during operation.

As one of the possible complications of purulent pleurisy noteworthy breakthrough pus in your bag or pericardial tissue of mediastinum with further development they purulent inflammation. In some cases there is penetration of infection through the diaphragm with the formation of poddiafragmalnogo abscess.

In addition, the complications of acute purulent pleurisy observed metastatic meningitis, brain abscess, purulent arthritis and General sepsis.

**4. classification of pleural empyemas**.

I. Etiology:

1. Nonspecific: 2. specific: 3. Mixed

-purulent-tuberculosis

-putrefactive-fungal

-anaerobic-syphilis

Ii. Pathogenesis:

1. primary 2. secondary

-travmatichekie-steam-and metapnevmonicheskie

-post-surgical-contact

-metastatic

III. Clinical course:

1. acute (up to 3 months) 2. Chronic (over 3 months).

IV. Destruction of lung:

1. Pleural empyema without destruction of the lung (simple)

2. Pleural empyema with destruction.

3. Piopnevmotoraks.

V. external reported Wednesday:

1. closed

2. Open:

-with bronhoplevralnym fistula;

-with plevrokozhnym fistula;

-with bronhoplevrokozhnym fistula;

-louvered light;

-with other hollow organs.

Vi. Common:

1. Separate

a) top

b) paramediastinalnye

) naddiafragmalnye

g) mezhdolevye

h) parietal

2. common

1) total

2) subtotal

**5. acute clinical picture empiema pleura.**

Acute pyothorax normally occurs with acute clinical symptoms typical of severe purulent infection.

When **parapnevmonicheskom** version of the currents is observed parallel development of pneumonia and purulent exudate formation in the cavity pleura.

**Metapnevmonicheskaja empiema pleura** occurs after crisis, when already launched political temperature drops after resolving pnevmonicheskogo focus and can be treated by a doctor mistakenly initially as a relapse of a lung inflammation.

The clinical picture of acute empiema pleura consists of General and local symptoms.

Among the **common symptoms,** it should be noted at the outset, increased body temperature and the emergence or increased symptoms of intoxication.

**Thermal reaction** during the initial period and the next, with no real treatment can be costly, leaking on remitirujushhemu type in the form of irregular waves with a tendency to decrease in the morning, not reaching, however, normal or even subnormal numbers. If you go to the purulent depletion happens inversion temperature curve. When putrefactive empieme fever is often hectic, with daily fluctuations of about 3° c, accompanied by sharp oznobami, sweating, severe general condition, sometimes vomiting.

**Degree of purulent intoxication** depends primarily on the incidence of purulent process virulence microflora and the individual patient's reactivity. Purulent intoxication is manifested in the form of headaches, weakness, appetite, progressive emaciation, loss of interest in the surrounding.

Many patients with acute empyema purulent intoxication is manifested by neuro-psychiatric disorders of varying degrees of symptoms: headaches, irritability, insomnia, rapid fatigue to psychomotor stimulation delirioznogo syndrome, coma.

Among the **local symptoms**occurring in acute empieme pleura, the most frequent are chest pain, shortness of breath and coughing.

**Pain in the chest** more often attributable to changes in the parietal pleura, but destruction of major lung structures become visceral nature. They have a constant nagging nature, deep breathing, coughing, tilted torso in a healthy way and pressing on the intercostal intervals. In this tense the muscles of the upper extremities, especially when verhushechnom Pleurisy (**a symptom of Pottendzhera-Vorobiev**). Often pain the patient takes forced position on the patient side, because the situation on a healthy functional load on an ailing half thorax increases. Accumulation of exudate reduces the contact area of pleural leaves, therefore decreasing pain while still existing inflammation.

**Shortness of breath** in acute empieme pleura is caused not only by an accumulation of fluid in the pleural cavity and the squeezing of light, but also septic-destructive process of pulmonary parenchyma, shunt the blood of kollabirovannyh divisions, violation of hemodynamics and bronhospasticheskimi reactions. The intensity of breathlessness is dependent upon the amount of hydrothorax and localise of empiema. When the big gidrotorakse it occurs alone. With limited jempiemah shortness of breath occurs when physical activity. But when the basal purulent pleurisy when respiratory movement during deep breathing markedly restricted due to sharp pains, it can also be observed in limited empieme.

**Cough** is the constant symptom with empieme pleura. With isolated lesions of the pleural cavity early in the disease there is a dry cough that is reflective in nature, that is connected with pleural irritation with the accumulation of leaves. effusion in pleural cavity cough may disappear and no longer appear. In cases where pleural empyema is suppurative complication destructive lung diseases, cough accompanied by a significant amount of purulent sputum. In the presence of bronhoplevralnogo fistula otkashlivaetsja much phlegm in the patient's position on the healthy side.

During the **examination the patient** acute empyema with significant accumulation of pus in the pleural cavity is primarily noteworthy his involuntary position in bed: usually the patient avoids turning a healthy side, preferring to lie on the affected side (this prevents exudate and mediastinal compression offset the opposite lung), and when expressed respiratory distress it takes intervention semisentados or sitting position, hands resting in bed (**orthopnoea**). In contrast, basal Pleurisy to reduce pain in the sore diaphragm is forced to lie most of the time on the abdomen.

**Examination of the chest** allows you to mark the asymmetry of the thorax by increasing her patient hand, predominantly in the nizhnebokovom Department, and a higher standing shoulder and nipple on this side. in most cases, the stated limit breathing movement ings the affected half of the chest. Paddle a little raised upwards, trailing when breathing compared to the opposite. In total and common acute pleural jempiemah often have flatness intercostal spaces, local swelling of the skin and subcutaneous tissue above the accumulation of pus in the pleural cavity. With a substantial accumulation of exudate may have curvature of the spine bulge in sick; often you can also strain the neck veins on the appropriate side, and when pravostoronne Pleurisy-offset heart jolt to the left.

**Palpation of the thorax** in patients with acute empyema often detects a slight thickening of the skin of the affected parties (swelling of the skin and subcutaneous fat), as well as their pain. cutaneous fold on the sick side turns out to be considerably thicker than healthy- **sign Vintriha** (m. a. Wintrich, 1864). In the future, chest wall tissue in this area become dense, increased pain, hyperemia skin appears, indicating a purulent meltdown of all segments of the chest wall and may be a harbinger of **empyema necessitatis**.

**Voice jitter** (fremitus pectoralis) on the accumulation of pus is usually absent or severely weakened.

**Comparative percussion** taped dulling the sound on the diseased half chest, increasing from top to bottom in the absence of air in the pleural cavity adhesions and upper limit corresponds to the obtuseness **of the line Damuazo-Ellis** (1), the top point of which located in the posterior axillary line. As you accumulate, eight ekssoudat gradually eclipsing laterally and upward air easy, partially kollabiruja its cortical divisions. This compression of light expresses the emergence over the line of Ellis-percussion Damuazo zone timpanicheskogo sound- **the phenomenon of Skoda**.

In total populating the pleural cavity pus dull perkutornyj sound travels almost the entire half of the chest, except for nadlopatochnoj and subclavian zones, with the latest in percussion you can identify the characteristic timpanit, running when you open your mouth to the sound of sick broken pot- **tracheal tone Williams**. This phenomenon occurs due to the sound perkutornogo of sound over pressed major abdominal swelling of lung tissue. In addition to the line-when Damuazo Ellis empieme pleura perkutorno distinguish two triangles. The first is **the triangle Garlenda** (2) is located on the sore side and is characterized by prituplenno-timpanicheskim sound. It corresponds to a preloaded exudate light and is located between the spine and the Ellis-Damuazo. The second is **the triangle Rauhfus-Grokko** (3), located on the healthier side and is a continuation of dullness, which is defined on the affected side. Katetami this triangle are the diaphragm and spine, and the hypotenuse is the continuation of the line Damuazo-Ellis. The emergence of this triangle is caused mostly offset the mediastinum in a healthy way. When empieme pleura are usually not defined by the mobility of the lower edge of the light on the side of the lesion.

Purulent pleurisy left is characterized by the disappearance of the **space of Traube** (left pleural fluid fills and sine instead of timpanita, corresponding to the gas bladder stomach is determined by dulling the sound perkutornogo).

When a breakthrough in the cavity plevralnuu pulmonary abscess and fistula bronhoplevralnyh forming the upper bound is located horizontally, and above it is determined by the timpanicheskij sound.

**If auscultation** noted the weakening of the vesicular breath until lack of it over plenty of liquid in the cavity, which is caused by both alveolar spadeniem in kollabirovannogo areas of the lung, and the presence of different thickness of interlayer exudate between the chest wall and biased light. The latest version while easing breathing it acquires bronhialny shade in conjunction with good conductivity of dense pus respiratory noises from the major bronchi podzhatogo lung. Above the zone of dullness (i.e. in the area of timpanicheskogo tone) also heard: 1) entering the breathing, breaking over it in normal lung (vezikuljarnoe) respiration; 2) sometimes listened to are moist rales, pointing to delay sputum in lung sites kollabirovannyh; 3) friction noise may be heard due to pleural fibrinoznogo Pleurisy around empiema cavity; most often friction noise heard in the early phases of the pleura exudation or resorption in a period when the amount of fluid is not so large to completely disintegrate the visceral and parietalnyj leaves the pleura. Bronhofonija in the perkutornoj area of dullness, as voice shaking, weakened.

In the presence of significant quantities of gas in a closed pleural cavity in patients with total empyema breath in its dissemination is not normally prepared, and while shaking the chassis of the patient often taped succussion (Hippocratis succussio) . Empyema patients with fistulas, bronhoplevralnymi, on the contrary, the last symptom may not be determined with good drainage cavity through the bronchi, but auskultativno noted empowered entering breathing type amforicheskogo.

When expressed and long current purulent intoxication develops liver diseases and heart insufficiency jenergodinamicheskaja. The resultant cardiovascular insufficiency manifested by tachycardia, unpleasant sensations in the heart, heartbeat, arterial gipotenziei and slowing circulation, akrocianozom. When the survey is determined by gluhost heart tones, sometimes arrythmia, the apex being heard systolic murmur. Subsequently, when you save a purulent intoxication develops legern-serdecnaya insufficient with increasing circulatory decompensation and hypertension in the small circle, as evidenced by the accent II tones on pulmonary artery pulsation in nadchrevnaja connection with right ventricular hypertrophy, the heart's electrical axis shift right on the electrocardiogram.

As a consequence, there are signs of violations intoxication purulent functions of organs rich in retikulojendotelialnoj tissue (liver, kidney, spleen, bone marrow). In a survey of patients defined by enlargement of the liver, sometimes a small ikterichnost skler and skin. At the extreme, on the verge of depletion, forms of purulent-resorptive fever patients develop swelling of the lower limbs and ascites. The origin of them due to hypo-and disproteinemiej.

The clinical picture **of some forms of** acute empiema pleura, except for signs of respiratory insufficiency, purulent intoxication and physical examination data, there are additional symptoms.

With **limited empieme** clinic is largely determined by the localization of the accumulation of pus. We differentiate between the top, pristenochnoe, naddiafragmalnoe, mezhdolevoe and paramediastinalnoe the location of the abscess.

When **the Crown empieme** may experience swelling of the nadkljuchichnoj area, and shoulder, plexitis, **Claude Bernard-Horner Syndrome** (PTOSIS, miosis, enophthalmos, hyperemia person on the side of the lesion).

For **parietal empyemas** characterized by expressed pain and limit amplitude of respiratory movements on the side of the lesion, the flatness of the intercostal spaces, swelling subcutaneous tissue, shortening of perkutornogo sound and easing breathing over the accumulation of pus.

When **basal (out) empieme** of the pain are more often in the lower chest and hypochondrium. They are reinforced by a deep inhalation, often radiating to the neck area, and shoulder. Therefore, the characteristic clinical sign of diaphragmatic Pleurisy is chest type of breathing. The patient breathes while doing just the top part of the thorax, the bottom remains fixed. Sometimes develops pain syndrome caused by irritation of the phrenic diaphragmatic nerve and parietalnogo sheet of peritoneum, blood aperture from the abdomen and pain in the supraclavicular irradiation is attributed to the hole on the fly diaphragmatic nerve at the neck, in the area of nadchrevja with a simultaneous reflex tension of the muscles of the anterior abdominal wall in this area. In this regard, there may be a need for differentiation of acute diseases of the abdominal cavity.

**Paramediastinalnaja empyema** can be compression of the superior vena cava syndrome.

Large and even the average largest pleural exudates can cause dislocation of the mediastinum and major blood vessels in a healthy way, that when moving to the left may be accompanied by a large dog leg venous vessels, dramatic swelling of neck veins, stagnation in the organs the abdominal cavity and decrease blood flow to the heart. Mediastinal offset to the right there is the offset of the aorta and pulmonary artery in particular, which also leads to the impoverishment of heart arterial blood, to reduce systolic and minute volume of the discharged blood. Large displacement of the heart and particularly large vessels may result in abrupt movements in bed when trying to sit down or stand up in sudden death.

**6. Methods of instrumental and laboratory Diagnostics.**

**X-ray examination** in acute empieme pleura and piopnevmotorakse has the greatest value that allows you to accurately verify the diagnosis and identify immediate tactics of treatment. the most informative is Plantar x-ray, allowing localized lesion to determine exactly the degree of collapse of the lung and mediastinum, offset the amount of fluid to identify pathological changes in the pulmonary parenchyma, set point for adequate drainage of pleural cavity, especially when limited empieme. When the rare mezhdolevyh jempiemah possible to puncture the abscess under x-ray control. It should be noted that x-ray is often sufficient to study diagnostic decision on the implementation of urgent (emergency) treatment — or puncture drainage of pleural cavity for its decompression in tight piopnevmotorakse. In his absence, if the condition of the patient, it is possible to perform lateroskopii, allows to precisely determine the vertical dimensions of the cavity, to assess the State of the basal lung divisions "covered" liquid level. If running lateroskopii on the healthy side of risk of aspiration of abscess contents (the weakened patients) to determine the lowest point of the cavity enough x-rays in lateral torso tilted forward or direct projection from tilt your torso in a healthy way. Additional x-ray research methods are applied after stabilization of patients. Their task is to determine the nature of a destructive process, its length and location. Imaging allows you to answer these questions, however, this study maloinformativno amid the collapse of a lung or a significant amount of fluid in the pleural cavity. Therefore, it should be performed after the drainage of pleural cavity and release her from the pus. If a lung collapsed more than 1/4 volumes, tomographic data interpretation is difficult. In these circumstances, it is possible to perform computed tomography of the chest drainage when connecting to aspiratoru "-mode vacuum ahead." Radiography in standard projections allows to fix the dynamics of pathological process and the adequacy of remedial measures. Very informative method of research is plevrografija in 3 's projections. It allows us to estimate the size of the cavity, the nature of its walls, the presence of seizures and fibrinozhnykh Grand strata. When plevrografii in position on the healthy side often kontrastirujutsja and bronchial tree, which is of great importance for further therapeutic measures (temporary occlusion of endobronchial perfluorane, optimization of washing mode the pleural cavity). The usual bronhografia patients in the acute period of spontaneous pneumothorax is not running because it could aggravate their condition and cause exacerbation of inflammatory process in the zone of destruction of lung tissue.

Diagnostic value of **Bronchoscopy** is determined by detection of malignant lesions in acute bronchial tree empieme pleura and piopnevmotorakse, oslozhnjajushhem for lung cancer, as well as identify stenosis of bronchus. Resolution Bronchoscopy increases when the introduction of dyestuff (aqueous solution of methylene blue) in the pleural space in position on the healthy side. This allows you to determine which bronchi are involved in drainage zone destruction of lung tissue, which is very important for the planning level of temporary occlusion of endobronchial perfluorane. Fibrobronchoscopy gives also insight about the severity of the inflammatory process in the trachea and bronchi, inevitably accompanying acute empieme pleura, that defines and intensity of treatment and its contents (therapeutic bronchoscopy, nazotrahealnye washing, introduction proteolytic enzymes).

The endoscopic studies also include thoracoscopy. Using the latest possible to more accurately establish the prevalence, cause of the pathological process and the presence of complications. Also if you can perform a thoracoscopy sanitization, removal of foreign bodies, ultrozvukovuju cavitation of the pleural cavity.

In **laboratory studies** of peripheral blood identified anemia, significant increase in the number of cells (up to 20-109 in 1 µL), sharp left shift with the advent of Leukocyte formula junior forms of neutrophils, high leukocyte index intoxication. Biochemical blood analysis identifies gipoproteinemiju, violations of the liver and kidneys (increased transaminases and phosphatases, creatinine, urea). Urine test confirms the presence of toxic nephropathy (zilindruria, proteinurija). Study on the indicators of vodno-elektrolitnogo Exchange giperkaliemia, objasnjaemuju allows you to mark the collapse of the fabrics and loose blood.

In the study of indicators of blood coagulation, draws the attention of the tendency to decrease with time of coagulation blood clotting, a significant increase in Fibrinogen levels.

**Pleural biopsy** -must be made in all cases where the suspect for the presence of fluid in the pleural cavity.

Modern level of diagnosis and treatment of acute pleural empyemas includes full microbiological (incl. viral) sputum examination, Lung abscesses and pleural cavity (exudates). In addition to the traditional methods of bacteriological analysis of substrates for the identification of pathogens of pathological process, determine their sensitivity to antibiotics, must increasingly be used identification methods of anaerobic pathogens. Given the complexity of recent and significant research duration (up to one and a half weeks), it is advisable to use express-methods of verification of anaerobic lung destruction. These include gas-liquid chromatography of extracts of various biological substrates (sputum, pus) to detect the presence of volatile fatty acids korotkocepochnyh — products of anaerobes — and thus confirm their involvement of suppuration. Quite informative is a bakterioskopija smear of pus by drainage of pleural cavity. Unable to set the group membership of microorganisms (staphylococci, streptococci, wand-gram and Gram-negative, anaerobic microorganisms — peptostreptokocchi, bakteroida, Fusobacterium, etc.).

Viral research includes the study of mucosal scrapings of the nasal cavity, pharynx, bronchi, as well as lavazhnoj fluid obtained by Bronchoscopy (highlight cells immunofljuorescencija, incubation on chick embryos and cell cultures), and also conventional serological studies.

**A study of respiratory function.** -Reduction of the STAION and Spirography MVL more than 25-30% of the proper values, lower KIO2 below 25 while reducing arterial blood oxygen saturation less than 90% and reduction of arteriovenous oxygen difference require special attention when determining testimony to the complex surgery.

Integrated rheography body-provides information on the productive work of the heart.

Diagnostics related complications acute empiema pleura, such as pulmonary bleeding, massive hemoptysis, aspiration pneumonia contralateral lung, pose no significant difficulties.

**7. Treatment of acute empiema pleura and piopnevmotoraksa**.

**General principles of treatment**.

Currently, intensive conservative treatment with the use of "minor surgery", as well as endoscopic methods is the mainstay of treatment of most patients with acute empyema and piopnevmotoraksom, whereas surgical intervention is used in acute period only for special reasons, arising mainly in cases of ineffectiveness of conservative therapy.

Treatment is carried out **in three main directions**:

1) influence on macroorganism-measures aimed at maintaining and restoring the overall status and correction of impaired homeostasis;

2) effect on microorganism-measures directly aimed at suppressing the microorganism causing infection;

3) local treatment-measures aimed at ensuring optimum drainage of pockets of destruction in the lung and pleura (poluoperativnye methods);

**1. Epidemiological mode**. the conditionsin which the sick with pulmonary pathology must allow everymodulation each patient or a group of painfrom repetitive microflora .

**2. Diet**. Wholesome food with high content of proteins and vitamins in the diet. Positive effects from depleted patients achieved use of anabolic hormones: retabolila (50 mg), superanabolona (1-2 ml intramuscularly once a week), methandrostenolone, nerobola (0.002 three times a day inside), DECA-derubolila (1.0 ml IM 1 time in 2 weeks). Mandatory is the appointment of vitamin preparations as inside, and intravenously (Ascorbic acid 5%-10.0; vitamin b6 5%-1.0; nikotinova acid 5%-1.0; vitamin b1 5%-1.0 daily vitamin B12 - 500 μg).

**3. correction of energy and vodno-elektrolitnogo balance protein loss and dezintoksikatsionnaya therapy**. to this end applied multicomponent infusion therapy. For long regular infusions of the subclavian vein catheterization is better to use on Seldingeru on the side of the affected lung. Catheter need every day to wash 1 ml of physiological solution, containing 5000 IU heparin, with abandonment of part of the solution in the lumen of the catheter-"geparinova seal.

**Energy needs** provided mainly vvedeni it concentrated (20-40-50%) solutions of glucose (approximately 15-25 kcal/kg) on the mandatory addition of insulin at a dosage of 1 IU per 3-4 g glucose. This solution is introduced from 1 up to 3 litres per day.

**Common protein loss** empyema patients, especially with active destructive processes in the lung tissue, ranging from 7 to 20 g of nitrogen per day, which is equivalent to the loss of the 44-125 g of protein per day or 500 g of muscle tissue. Number of dropped-based protein should fill at least 40-50% of its daily needs. The most commonly used amino acid mixture (polyamine, wolfersdorf) and protein hydrolysates (aminotrof, aminokrovin, infuzamin, amicine) at the rate of 1-2 grams of protein per 1 kg of body weight. When expressed gipoalbuminemii injected human albumin at a dosage of 100 ml 2 times a week.

For **detoxification** apply low polyvinylpolypyrrolidone (gemodes, neokompensan, periston) and dextran (reopoligliukin, reomakrodeks).

**4. Immunotherapy and immunotherapy**. During the height of the infectious process widely used means **of substitution (passive) immunotherapy**. These include, first and foremost, the infusion of blood and svezhecitratnoj specific giperimmunnoj plasma. Known antistafilokokkova plasma antisinegnojnaja plasma and plasma with high concentration of antibodies to proteju. Antistafilokokkovuju plasma in acute empieme pour on 200-250 ml every 1-2 days 3-5 times.

**Immunomodulirujushhaja therapy** shows patients whose laboratory tests detected deficiency of t-lymphocytes and their subpopulations, as well as the reduced level of immunoglobulins and phagocytosis in acute infectious process or when the trend towards halting it to flow. correction most frequently used sodium nukleinah, levamisole, diucifon, metilurazil, pentauxil, t-aguin, timalin, etc.

**Modern methods of efferent detoxification therapy** : hemosorption, plasmapheresis, limfosorbcija, a combination of plasmapheresis Exchange with low laser irradiation eritrocitarna mass gemosplenoperfuzija returned, the method of ultraviolet radiation (UVR) blood, or autotransfuzii UV-irradiated blood (AUFOK).

**5. Anti-inflammatory and desencibilizirutaya therapy**. the basis of anti-inflammatory therapies are drugs salicylic acid drip feedof Bani 1% calcium chloride solution or Calcium Gluconate. The extensive jempiemah involving expressed intoxication products of disintegration of proteins, it is advisable to use antigistaminnah funds: pipolfena (diprazina), dimedrol, suprastina, diasoline, tavegila.

When common and total jempiemah pleura in the acute phase, especially combined with destructive processes in the lungs, it is advisable to optimize processes otgranichitelnyh intravenous infusion application of inhibitors of proteolysis (trasilola, gordoksa, kontrikala).

**6. Oxygen therapy** shows all patients with significant respiratory disorders. for this purpose, it is best to use thin catheters placed in the nasal passages to a depth of 10-12 cm, on which the oxygen in the number 5 as-7 litres per minute.

**2) Jetiotropnaja therapy**.

Common antibacterial therapy is an important part of the complex treatment of acute empiema pleura. But it can be successful only if sufficient drainage of abdominal cavity.

**Principles of rational anti bacterial Therapeutics** : use of antibiotics given Ying dividualnoj sensitivity; use of antibiotics with light sensitive STI bacterial flora to the drug; application broad-spectrum antibiotics and combinations of several antibiotics, taking into account cross-banks sustainability of flora and sound combinations; application antibiotic diffusion full courses, changing medication with long-term use it; starting a course with a shock dose, using the then supporting dose; the choice of the most rational routes of administration, reducing the maximum concentration of the drug in the focus of inflammation; Since antibiotics have a weetaminougnetajushhim effect necessarily apply, vitaminsGroup b; to prevent candidiasis werewidely used antifungal agents; with a view to the prevention of dysbacteriosis appoint preparations containing probiotik bifidumbacterin and normalizing bowel microbiota (bifidumbacterin Forte, bifiform, b 26f1d ifeynol).

Antibacterial treatment of nonspecific Pyo-destructive lung and pleura is the most commonly used medications related to groups of β-laktamov (Penicillins, cephalosporins, carbapenem), aminoglycosides and nitroimidazolov.

**3) local treatment empiema pleura**.

**« U bi pus, ibi evacua»** is a fundamental position of Hippocrates is fully jempiemam refers to the pleura and piopnevmotoraksu. Seeking to evacuate the pus, you must simultaneously seek to stage lung and elimination of purulent cavities due to approximation of visceral pleura to parietal.

**The main means of** topical treatments are: piopnevmotoraksa and empiema therapeutic pleural punctures, closed drainage cavity empiema, pleural cavity, lavage treatment-diagnostic thoracoscopy, unfolding against the backdrop of lung kollabirovannogo temporary occlusion of bronchial fistula.

**Pleural punctures** as an independent method of treatment can be used in acute limited empieme pleura without bronhoplevralnogo fistula. In the absence of the effect in time 5-7 days should move on drainage treatments.

**Drainage of pleural cavity** Indication for private drainage. are acute pyothorax (irrespective of prevalence) with bronhoplevralnymi messaging, acute common and total empiema, piopnevmotoraks, post-operative pleural empyema, punkcionnogo method failure within 5-7 days.

Way to the drainage cavity empiema for aspiration or lavage is the following: after x-rays or plevrografii scheduled for introduction of the drainage point, possibly near the bottom of the cavity. With the free gidrotorakse point for thoracocentesis is the sixth-eighth intercostals space in the posterior axillary line, which depends on the height of the standing of the dome of the diaphragm. If the need arises in the second tube, and when total piopnevmotorakse this is always, it is injected into the dome of the cavity (with the free pnevmogidrotorakse, this point is the second mid-clavicle intercostals space in the line). Under local anesthesia after the cut skin through the intercostals space marked point injected from a body cavity, stiletto, convinced of the correctness of the trocar position and through it in the cavity injected silicone or hlorvinilovuju tube with internal diameter 0.3-channel 0.15 cm one face and 2-3 side vents.

**The complications**that arise when draining pleural cavity: damage of the lung, diaphragm, abdominal cavity organs; vnutriplevralnoe bleeding with a damaged finger artery; infectious complications from the soft tissues of the chest wall (cellulitis, Necrotizing Fasciitis, myonecrosis chest wall; subcutaneous and intra-muscular emphysema).

The most effective methods of closed drainage are aspiration with a large vacuum and cavity lavage empiema. This method most acceptable when extensive jempiemah without bronchial fistula, as well as combined with small fistulami of the bronchi. Aspiration with a vacuum line in 30-40 cm of water pillar exercise using a centralized vacuum system, water jet suction or other absorbers.

**Active aspiration is contraindicated** with postoperative pleural jempiemah after pulmonectomies, as can happen, the offset of the mediastinum with cardiovascular compromise.

If the defect is significant and the bronchus through him plenty of air, then the active aspiration of pleural cavity does not make sense, because the vacuum conditions create impossible. In such cases, enjoy lower an underwater valve is **drainage of chest tube** ((B)ülau).

**Faction lavage** cavity empiema exercise when drainage cavity of one tube, introduced at the bottom of the cavity.

**Flowing lavage** by introducing two tubes. Through the upper tube filling dializatom cavity carry out, through the other permanent or recurrent aspiration.

From antiseptic use aqueous solutions furagina, furazilina, chlorhexidine bigljukontata, rivanol, ditol, jodpolivinilpirrolidon. To lavage pleural empyemas cavities caused by Pseudomonas aeruginosa, effective application of povidone-jodina. To treat important hydraulic cleaning pleural leaves and full continuous aspiration.

To accelerate the process of cleansing the abdominal cavity and **biochemical (enzymatic), the decortication of lung** successfully used proteolytic and fibrinolytic enzymes. Available in clinical practice of proteolytic enzymes (hemotripsin, fibrinolysin, trypsin, Ribonuclease) possess weak fibrinolytic activity. Drugs of choice may be drugs streptokinase (streptodekaza, streptoliaza, streptaza, dikinaza, avelizin), as well as and the immobilized terrilitin proteoliticeski enzyme profezim.

For better drainage and purifying the cavity empiema appropriate execution of **medical thoracoscopy**, during which perform the stretch of separation, remove necrotic and fibrinnye mass, wash out the cavity with a solution antiseptics. At the end of the procedure under the supervision of optics through a single puncture of the chest wall or through a tube placed in torakoskopa cavity silicone drain tube for the active aspiration.

**Temporary occlusion of bronchial fistula** foam or collagen obturatorami first applied Polish bronhologom r. Rafinski (1968) when treating staph destruction of the Lung in children: a method of temporary occlusion of bronchi, runs after the drainage and sanitation of pleural the cavity is foam or occlusion obturatorom collagen resulting in whistle or segmental bronchus, which diagnosed with Bronchoscopy search method of occlusion or after the introduction of cavity empiema solution metilenovogo Blue.

The mechanism of positive temporary occlusion of bronchi for purulent process in the pleural cavity is based on dividing using foam of bronchial and pleural cavity with the creation of the last strong vacuum. Continuous active aspiration exercise for 5-7 days. Length of foam of the obturator must not exceed two to three weeks, and it should be removed by Bronchoscopy.

**8. Operation with acute pleural empieme and piopnevmotorakse**.

Currently in acute pleural empieme and piopnevmotorakse apply restorative and PD recovery operations: dekortikaciju, plevrjektomiju with dekortikaciej and plevrjektomiju with resection of the lung. Time-bound execution of recovery operations their divided into early (proizvodimy in two-three weeks of onset), term (three to four weeks) and late (one and a half or three months).

**DIAGRAM OF DECORTICATION OF LUNG.**

**A-bag empiema; B-remove the visceral layers.**

**Decorticator** -Remove fibrinozhnykh Grand strata with visceral pleura fired first removing "false thickened capsule" with a light when tubercular empieme Delorme (Delorme) in 1892, in 1915, he called this operation dekortikaciej.

Regardless of Delormas in 1893 g. Fowler (Fowler) performed a similar operation, but deleted when tubercular empieme not only shell with a light, but also pleura selection with chest wall, mediastinum, and diaphragm. This operation later named **plevrjektomiej**.

**PLEVRJEKTOMII SCHEME.**

**And-parietal pleura; B-remove the visceral layers.**

An important prerequisite for the operation is stihanie acute purulent process in the pleural space and light, the normalization of the temperature, lowering the intoxication, sanation of the bronchial tree and the stabilization of the patient. This is usually achieved by the end of the first and beginning of the second month following the occurrence of empiema. By this time the deep layers of the pleura Schwartz represent mature fibrous tissue is formed the substrate to be deleted during decortication. Deposition on light are removed during this period, relatively easily, with a minimum of traumatization and blood loss. The operation is contraindicated in bilateral process.

For decortication of lung using lateral and anterolateral accesses. Delete entire bag empiema-ideal decortication of lung and plevrjektomii. Its main advantage is the Elimination of empiema already on the operating table and turn residual purulent cavities in a relatively sterile gemitoraksa cavity. Decorticator must necessarily be combined with diafragmolizom, i.e. liberation from the stretch the diaphragm.

The combination of partial lung resection decortication shows if there is a destructive process it (abscesses, bronchiectasic, multiple bronchial fistula) or expressed karnifikacii the proportion of light.

**9. chronic EMPIEMA PLEURA**.

Chronic pyothorax arises when the reparative processes, developing during the acute phase of inflammation, not the end of the regeneration.

For chronic inflammation is characteristic of automatic alternation of phases of exacerbation and remission, when every unfinished cycle of aggravation leaves some rubber reclaim, resulting in excessive tissue products appears.

In the face of chronic empiema pleura identifies **three layers**:

1. External- **piogennyj layer**, composed of granulation tissue and intimately associated with it-purulent fibropurulent applications.

2. Medium- **scarry layer**consists of collagen fibers; is the bulk of the wall of chronic empiema.

3. Internal-formed spoilt **sklerozirovannymi layers of pleura**.

In this stage of inflammation wall thickness reaches 2-3 cm, while the parietal pleura-side wall in 2 times thicker than by the visceral pleura. Wall bag empiema very rigidny, cartilage density, hard cut with a knife. On the inside of their surface detected RAID fibrin and pus up to 5 mm thickness.

Pathological feature changes in chronic empieme evolving not only in the surface layers of the pleura, as in acute process and capture all the layers of the pleura, the lung tissue, chest wall, mediastinum, causing significant functional violations. As a result of inflammatory-sclerotic changes in pleura formed a powerful shell, which is preventing the respiratory movements, leading to a drastic violation of lung function and lung fibrosis, plevrogennogo development process becomes irreversible and rejekspansija easy, even after removing the plevrolegochnoj sheet-anchors, is impossible.

Based on clinico-morphological features to distinguish **three stages of chronic empiema pleura**.

**(I) stage** , for up to 5 months from the start of the acute empiema, characterized by the fadeout of the inflammatory process in a gradual thickening of the pleura and pleural leaves at the expense of developing granulation tissue in the pleura and fibrinozhnykh Grand Canyon beddings. Purulent hearth (residual cavity) otgranichen massive vnutriplevralnymi shvartami, which represent a mature, richly infiltrirovannuju gistiolimfocitarnymi connective tissue cells. Destructive process extends into the deeper layers of the pleura surrounding tissues and organs. From the parietal pleura depart fibrous bands outside of the vnutrigrudnoj fascia and intercostal spaces causing impaction and obliteraciju blood vessels, ischemia, with a gradual progressive fibrosis of the inner layer of muscles.

**Stage II** (from 5 months to a year). Pathological feature changes are more pronounced: fibrous sheet-anchors sklerozirujutsja, their thickness at the parietal pleura reaches 3-4 cm or more and the intercostal muscles shrink and replaced by connective tissue, intercostal the gaps narrow, Aperture is flattened due to massive oshvartovanija her pleural cavity volume decreases. The inflammatory process extends to the periosteum of the ribs and rib.

Visceral pleura also compacted, however the thickness of the fibrous Schwartz here does not exceed 0.5-1 cm. Barrier function of visceral pleura between gnano-fibrinoznymi blends and lung tissue compromised: by mezhdolkovym partitions in lung tissue sprout fibrous cords. Changes in the light gradually progressing process involves peribronhialnaja tissue, which leads to deformation of the bronchi and the violation of their drainage function. Chronic inflammation in the lung, and develop pnevmofibros, bronchiectasic. Often in the surface layers of the lung are formed small abscesses. Significant compression of lung shvartami and advanced pnevmofibros lead to pronounced respiratory disorders.

**Stage III.** Kollagenizacija and gialinoz pleural Schwartz were accompanied by the deposition of calcium salts and the formation of bony structures ("patient" or "bone calcium plates pleura"). In the pulmonary parenchyma increasing degenerative changes, which develop secondary suppurative processes by type bronhojektazij. Often peribronhit and bronchiectasic evolve and in a different light.

Zone plevrogennogo sclerosis is distributed into the tissues of the chest wall. Umbilicus degeneration of muscles, almost complete convergence of ribs, changing their shape and mobility, along with a dramatic violation of the mobility of the diaphragm and significant progression of pathological changes in lung, cause growing respiratory failure.

Deformation of thorax and pleural cavity volume reduction lead to hemodynamic disorders due to displacement of the mediastinum, strong inflection of large vessels (hollow veins, pulmonary arteries and veins) and development in a number of secondary cases of pericarditis .

Chronic purulent intoxication is causing Amyloidosis of the internal organs.

**10. The CLINICAL PRESENTATION of CHRONIC EMPIEMA PLEURA.**

The main features of the transition of acute empiema chronic are lowering body temperature to a normal or subfebrile, well-being, reduction and stabilization of the volume of discharge of purulent residual pleural cavity.

**In the first stage of chronic empiema** the patient's condition satisfactory, chest pain diminished or disappeared, almost no signs of intoxication and purulent respiratory insufficiency. Only the presence of resistant residual cavity with a small amount of pus or scanty pus selection of plevrokozhnogo fistula indicate chronic inflammatory process. Laboratory signs of purulent process also expressed little: only a moderate increase in ESR, slight anemia, desproteinemia.

When the slightest unfavourable circumstances (cooling, overwork, co-morbidities) develops worsening: body temperature rises, there are shivers, chest pain, increasing signs of purulent intoxication increases the amount of purulent discharge from plevrokozhnogo fistula or amount of purulent sputum (when empieme with bronhoplevralnym fistula). Increasing anaemia and desproteinemia, leukocytosis and blood neitrofilny shift to the left.

**Stage II chronic empiema** the pleura is characterized by more severe clinical picture: amplified malaise, deteriorating appetite, increasing shortness of breath and heart palpitations. If it is accompanied by a lightweight process greatly enhanced cough, increases the amount of purulent phlegm. Unstable chest pain, stabbing nature often arise or are amplified during physical exercise. When you move the chest wall tissue inflammation and involvement in the process of nerve trunks pain can irradiirovat in the hand, shoulder and belly.

When inspecting patients such noteworthy their pallor, cyanosis, sometimes. Thorax uneven participates in the Act of breathing. By palpation are often swollen and soft tissue infiltration over the cavity empiema, especially in the presence of plevrokozhnogo fistula. Percussion and auscultation data is different depending on the location and size of abdominal cavity, the amount of liquid in it, the thickness of the stretch. Tachycardia is more resistant than in stage I, not only because of purulent intoxication, but also offset the mediastinum. Boundaries of the heart can be removed. During electrocardiography identifies violations with signs of hemodynamic pulmonary hypertension.

**In stage III chronic empiema** (with duration of illness for more than a year) there was considerable deformation of the chest, ribs on the side of the lesion are sedentary, intercostal gaps narrowed sharply nadpleche omitted. Almost always has a plevrokozhnyj fistula, often osteomyelitis ribs or chondrite. The clinical picture is dominated by this stage phenomenon prolonged respiratory failure and chronic purulent intoxication. In acute purulent process and violation of outflow from the condition of patients significantly worsens, increasing intoxication. For a long period of purulent accompanied by the development of the exhaustion of sick, anemic, sometimes amiloidnym rebirth of kidneys and other internal organs.

**Complications** chronic empiema pleura: bronchial fistula; accompanying changes in podzhatom shvartami light (abscedirovanie, light karnifikacija, bronchiectasic); pulmonary bleeding; internal organs Amyloidosis; heavy depletion; "pulmonary" heart.

**11. diagnosis of CHRONIC EMPIEMA PLEURA.**

Diagnosis of chronic empiema does not differ from that in acute empieme pleura and piopnevmotorakse. To clarify the localization and the size of abdominal cavity, its configuration of the walls showing plevrografija, fistulography. Of great importance for the assessment of the State of the light and the selection of therapeutic tactics have imaging, bronhografia and angiopnevmografija.

**Bronhografia** conducted for: 1) identify the State of the bronchial tree in kollabirovannom light; 2) diagnosis of bronhoplevralnyh fistula, often accompanying empieme; 3) establishment, in some cases, causes, i.e. identification empiema bronchiectasis, abscess, preceding and contributing to its emergence.

Training includes two main points-oral hygiene and sanitization empiema bronchus tree. As a contrast to conduct drug use bronhografii **lipiodol**.

**When bronhografii** changes are characterized by the following radiological symptoms: 1) "empty zones, i.e. the absence of branching bronchi localization empiema bag, respectively; 2) convergence of the bronchi; 3) different types of curvature, deformations, kinks Terminal branches of the bronchi.

**Plevrografija** (introduction of contrast material in the cavity plevralnuu followed multi-axle rentgenoskopiej and x-ray) is an auxiliary method of research to refine the size and configuration of the cavity empiema. In some patients with plevrografii dye penetrates through the fistula in entering the wood, in connection with a cough with sputum Office containing traces of contrast material, a valuable diagnostic sign of existence of bronhoplevralnogo fistula.

**Fistulography** conducted in patients with pleural-skin and pleural-Dermato-bronchial fistulas.

In the long-term existence of chronic empiema in kollabirovannom light come irreversible morphological changes significantly violate functionality easy.

**12. TREATMENT of CHRONIC EMPIEMA PLEURA.**

In acute purulent process tasks General treatment are the same as in acute empieme pleura. In remission when the disease manifests itself mainly by the presence of plevrokozhnogo fistula without signs of intoxication and expressed homeostasis is only a restorative treatment and treatment of opportunistic diseases, if any. In the period predopera zational preparation should be used by all tools to help eliminate delays pus in the cavity, clean walls empiema and smaller residual pleural cavity.

**Tasks of surgical treatment** chronic empiema pleura are reduced to eliminate the hotbed of infectious process and eliminate persistent residual pleural cavity.

**Decorticator light** in chronic empieme compared to acute greatly hampered due to dense fibrous srashhenijami Schwartz with visceral plevroj and has success on stage I disease. After decortication, pnevmoliza and diafragmoliza is guaranteed to run pleurectomy.

If there is purulent-destructive pockets lightweight (abscess, bronchiectasic, multiple bronchial fistulas) pleurectomy combined with partial resection of the lung. The need for simultaneous lung resection was planned even before the operation based on radiographic and bronhograficheskih studies, and the amount finally determined after resection of the Visual and palpation of lung research during interference.

In patients with osteomyelitis of the ribs, as well as in the presence of foreign bodies in the residual cavity effective readjustment and liquidation of the cavity are possible only after removal of these hotbeds of infection.

In the long-term existence of chronic empiema pleura irreversible changes in divisions kollabirovannyh light (karnifikacija), and it loses its ability to stage even after decortication. In such cases, to eliminate the residual cavity can be only torakoplastikoj or muscle plasticity. In some cases, quality of preoperative oral suctioning resorted to forming a broad torakostomy by filing of the skin to the periosteum of the ribs or to vnutrigrudnoj fascia (Clagett and Geraci, 1963).

**Jekstraplevralnaja torakoplastika** (J. Estlander, 1879), which involves resection of ribs over cavity empiema, now practically does not apply due to lack of effectiveness, because it is not excised parietal and visceral sheet-anchors and after surgery, usually stored shhelevidnaja purulent cavity.

**Fig. 1 TORAKOPLASTIKA on SCHÄDE: a-line skin incision scheduled dashes; B-otpreparirovan musculocutaneous flap and unscrew upwards; -Residual cavity empiema wide open; rebernoplevralnyj flap surgery.**

**Intraplevralnaja torakoplastika** (Schäde, 1890) provides not only the resection of ribs, but sheet-anchors and parietal with the intercostals, vessels and nerves (fig. 1). Surgical technique is that cut from the edge of the large chest muscles at the level IV ribs down to X ribs, then go X the rib to the shoulder line and turning up, cut through all the soft tissue at the inner border of the scapula; huge musculocutaneous flap otpreparovyvajut and giving way. Naked ribs along with the intercostal spaces and parietal tissue shvartoj tracheobronchial atomically. After careful hemostasis musculocutaneous flap is put into place, locking the individual stitches to visceral schwarte, especially in the area of bronchial fistula. Under the flap fail several drainages, and the wound is sutured, pressing with a layer of bandages to bandage.

This operation allows you to successfully eliminate the cavity even when running a chronic empieme, but high mortality (20-50%), emergency trauma and inevitable disability patients due to sharp skeletal deformities have significantly reduced testimony to this intervention. To reduce traumatic operation split into several stages, operated via 1-2 months.

**(a))**

**b)**

**in)**

**Fig. 2. STAIRWAY to TORAKOPLASTIKA B.e. LINBERGU: a) rib rezecirovany, mezhreberij intersection in deep cavity empiema; b) empiema cavity slits through tamponade on the go the ribs; in) closing wounds.**

**Stair torakoplastika** on Heller (1912) and b. e. Linbergu (1945) is one of the species intraplevralnoj torakoplastiki (fig. 2). When the operation to expose and podnakostnichno rezecirujut rib over the cavity through rezecirovannogo bed empiema ribs reveal a cavity. Define the dimensions and other rezecirujut empiema rib going over the edge of the cavity to 2-3 cm. Cut through the periosteum and reveal a cavity on the go is resected rib, tracheobronchial parietalnuju shvartu, scrape out the inside wall of the jempiemnogo SAC. Formed the "rungs" of the tissues of the intercostal spaces at deep cavity (more than 3 cm) cut through the alternately: one front and one rear. Formed pieces dipped to visceral pleura. After careful hemostasis in each incision GIFs tampon, not summing it up under the crossbar. Musculocutaneous flap lock stitches and put a pressure bandage.

**Methods of muscle grafting** cavity empiema offered f. Konig (1878) for elimination of residual Crown and A.a. Abrazhanovym (1899) for the closure of the pulmonary-pleural fistula. Depending on the localization of jempiemnoj cavity and the muscles of the chest wall, you can use the pectoralis major muscle, the broadest muscle back, less-diamond-shaped, toothed or long back muscles. The essence of operation is vykraivanii muscular flap in leg blood flow respectively and so that the flap is consistent with the size of the cavity, and when it is rotated to fill the residual cavity is not violated blood flow to the muscle tissue.

In all cases, surgery ends an active cavity puncturing wounds of soft tissues, that along with tight suturing wounds and pressing a bandage provides good exposure of the tissues and obliteraciju cavity.

Most of the bone and chest wall surgery lead to sharp chest deformation, decrease the function of the shoulder girdle and progressive irreversible functional disorders of the respiratory and cardiovascular activities.

**Intraoperative complications.**

The most frequent is **bleeding** from vascular and chest wall adhesions, sometimes from the vessels of the lung, mediastinum, and diaphragm. Bleeding from multiple small receptacles adhesions recalls parenhimatosnoe and can cause significant blood loss (700-1000 ml).

When damaged, the veins of the pulmonary circulation possible air circulation in vascular track of residual pleural cavity or cavities in the lung and the development of **air embolism** of blood vessels of the brain.

Dangerous complication during surgical interventions is **acute respiratory failure** due to blockage of bronchus tree pus, mucus or blood.

**Lung Damage** during the pnevmoliza and decortication.

**Damage of the diaphragm** , pericardium, the esophagus during plevrjektomii.

**Postoperative complications**.

1) vnutriplevralnoe bleeding and development of Hedgehog rolled gemotoraksa;

2) arrozivnoe bleeding due to necrosis and destruction of the walls of the stump of the fermenting vessel pus in conditions empiema (putrefactive);

3) Lung atelectasis and pneumonia due to blockage of bronchial phlegm, mucus or blood;

4) residual pleural cavity and relapse empiema;

5) pulmonary vascular thrombosis and embolism,

6) metastatic septic abscesses of the brain, kidneys and other organs.

**13. TEST TASKS**

Select one or more correct answers.

1. The patient had ACUTE LUNG ABSCESS. THAT THERE CAN BE A COMPLICATION OF THE DISEASE:

a) breakthrough abscess in the pleural space;

b) bleeding;

b) aspiration of pus in the healthy lung;

g) sepsis;

d) education dry cavity in the lung.

2. In the TREATMENT of CHRONIC LUNG ABSCESS is APPLIED:

(a)) pnevmotomija;

b) punkcionnoe drainage of abscess cavity;

Lung resection);

g) transbronhialnaja puncture the abscess;

d) decorticator lung.

3. ACUTE PNEUMOTHORAX is NOT TYPICAL:

a) shortness of breath at rest;

b) pain syndrome up to shock;

the liquid level in horizontal) pleural cavity;

g) tachycardia;

d) change perkutornogo sound.

4. In the TREATMENT of CHRONIC LUNG ABSCESS is APPLIED:

(a)) pnevmotomija;

b) punkcionnoe drainage of abscess cavity;

Lung resection);

g) transbronhialnaja puncture the abscess;

d) decorticator lung.

5. What is the MOST COMMON CAUSE of SPONTANEOUS PNEUMOTHORAX:

and lung abscess);

b) lung cancer;

in) bronchiectasis;

g) Bullous lung cysts;

d) Lung atelectasis.

6. For a BUSY PNEUMOTHORAX NOT TYPICAL:

and the affected lung compression);

b) decrease venous inflow to heart;

mediastinum in offset) the affected party;

g) increased pressure on affected side;

d) sonorous heartbeat.

7. While developing PIOPNEVMOTORAKSA with ABSCESSE LIGHT in the first place SHOWS:

and jendobronhialnoe) introduction proteolytic enzymes;

b) drainage of pleural cavity;

in) antibiotics;

g) retgenoterapija;

d) administering cytostatics.

8. The patient had ACUTE PIOPEVMOTORAKS. WHAT IS CHARACTERISTIC FOR THIS DISEASE:

1) expressed pain syndrome with shokopodobnymi signs;

2) no pain;

3) shortness of breath at rest;

4) availability of horizontal level of fluid in the pleural cavity;

5) lack of horizontal level of fluid in the pleural cavity.

What are the signs you believe correct?

a) 1, 2, 3;

b) 1, 2, 5;

3.5);

g) 1, 3, 4;

d) 3.4.

9. What is SHOWN for the TREATMENT of POSTOPERATIVE ATELECTASIS:

1) breathing exercises;

2) banks on the chest wall;

3) vagosimpaticheskaja blockade;

4) FBS;

5) strict bed rest.

Choose the best combination of answers:

and 1.2);

b) 1, 2, 3;

1.5);

g) 1, 3, 4;

only 5) correctly.

10. The patient had 52 years AFTER ABDOMINAL OPERATION in X-RAY INSPECTION REVEALED PLATE LOWER RIGHT LUNG LOBE ATELECTASIS. OVERALL, HIS CONDITION IS SATISFACTORY. NORMAL TEMPERATURE. YOUR EVENT?

1) massage the thorax;

2) breathing exercises;

3) antibiotic treatment;

4) inhalation;

5) puncture of pleural cavity.

Select the correct combination of answers:

a) 1, 2, 3;

b) 2, 3, 4, 5;

1, 2), 4;

g) 1, 3, 4;

d) all the answers are correct.

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