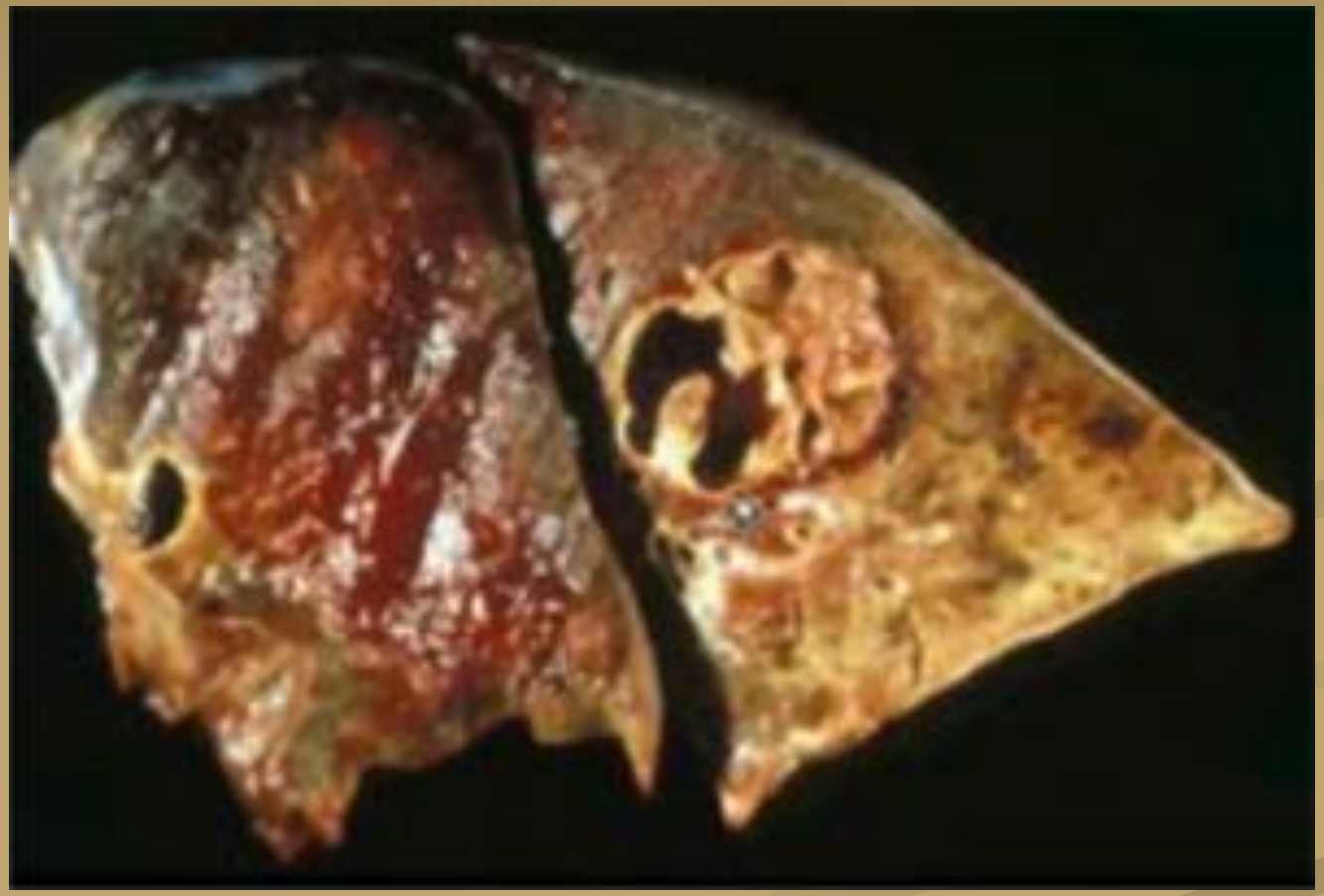
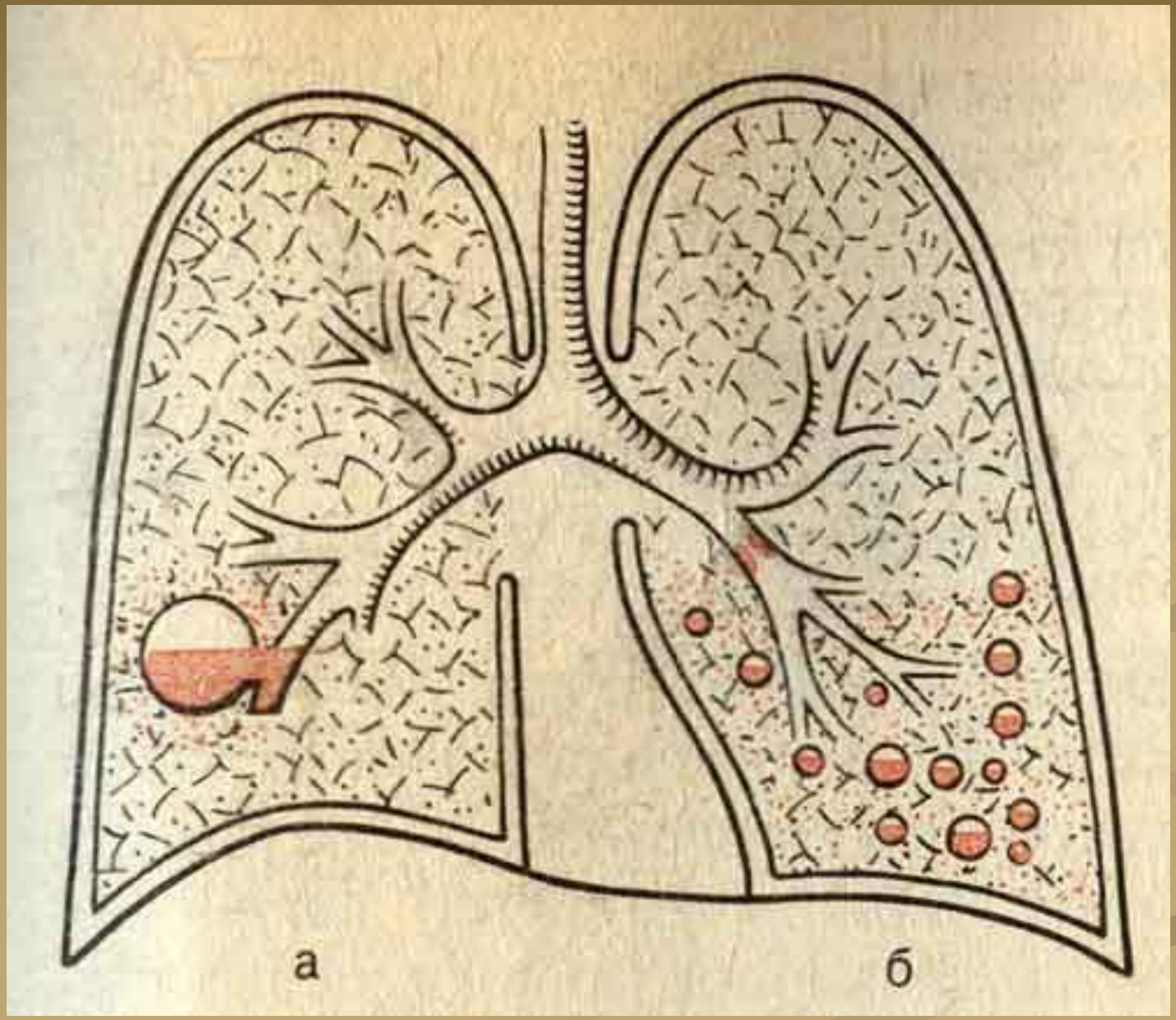
# SUPPURATIVE LUNG DISEASES

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1. Acute and chronic nonspecific suppurative lung diseases is a rather pressing problem of late years, from the surgical viewpoint included - many of the patients with suppurative lung diseases need surgical correction.

- 2. Nowadays, the classification of suppurative lung diseases by P.A. Kupriyanov and A.P. Kolesov is used by surgeons. The following suppurative lung diseases are identified:

a) **Abscesses and lung gangrene**

**There may be:**

**pyogenic abscesses: sharp and chronic (single and multiple ones);**

**gangrenous abscesses: sharp and chronic (simple and multiple ones)**

**b) Pneumoscleroses after lung diseases**

- c) **Bronchiectasis, which may be sometimes combined with pulmonary atelectasis**
- **d) Fester lung cysts**

- Lung abscess is a limited purulent-destructive process, accompanied by the formation of single or multiple purulent cavities in the lung tissue, having a fibrous capsule.

- Lung gangrene is a purulent-putrid process in the lung tissue, which is most often spread in one or two lung lobes or all over the whole lung and has no clear boundaries and demarcations (without capsules).

V.I. Struchkov has described a group of symptoms characterizing purulent lung diseases. The most common of them are: cough, purulent sputum, blood spiting, chest pain, fever, change of chest shape, "drum fingers" and "hour glasses of nails

**Lung abscesses develop as the result of penetration of pyogenic microorganisms into the lung tissue. Microbes are being brought into the lung tissue in different ways:**

- - as result of injury caused by a wounding weapon (a bayonet, a knife);
- - with foreign bodies: tonsil residues after tonsillectomy, vomiting mass during anesthesia, alcohol, unconsciousness;
- - through lymphatic and blood vessels out of adjacent bronchiectatic cavities;
- - under the conditions of peace-time lung abscess which is often the result of pneumonia, influenza or acute respiratory disease complications.

- Lung abscesses are more often observed in men (5: 1) aged from 20 to 40 years. In practice, the right lung abscesses are most frequently observed (about 2/3 of the cases). The clinical picture of lung abscess includes two, clearly distinguished, periods: a) prior to the abscess opening into the bronchus lumen or the pleural cavity (abscess formation); b) during the period of abscess opening and its cavity drainage.

- There are *primary abscesses*, which are formed in a previously healthy lung after injuries or resulting from aspiration of foreign bodies and *secondary* ones, which develop on the basis of the prior lung diseases, such as pneumonia, bronchiectasis, lung cancer and others.

- **Lung abscesses are subdivided into *aerobic* and *anaerobic*.**
- - Aerobic abscesses are common abscesses, containing odorless pus. Their flora usually consists of several kinds of pyogenic microorganisms, including staphylococci, streptococci and pneumococci.
- - The anaerobic lung abscesses contain pus with sharp putrid odor. With moderate odor, they are called putrefactive (nutridny), with a particularly strong odor – gangrenous ones. The smell is conditioned by the decay of the lung tissue sequester.

- **According to their pathogenesis abscesses are classified into:**
- a) postpneumonic or metapneumonic abscesses, which occur as a complication of pneumonia and can be considered as further development of inflammatory process with its transition to abscess formation;
- b) embolic abscesses, caused by an infectious agent, which is brought together with the embolus by the blood stream from other organs (thrombophlebitis, osteomyelitis, sepsis);

- c) aspiration-occlusive abscesses, caused by aspiration of foreign bodies, often infected in the oral cavity;
- d) post-traumatic abscesses, these are particularly frequent with blind injuries when a bullet or a fragment of the projectile remains in the lung tissue;
- e) lymphogenous abscesses, occuring as result of lymphatic infection of the lung from pleura, mediastinum, chest wall, liver, diaphragm.

- As to their course lung abscesses can be acute and chronic.

- As to localization lung abscesses are classified into:
- - parietal, - median, - solitary, - multiple and root (deep) abscesses

- **Clinical picture**. By the clinical course of pulmonary abscesses two periods are distinguished: the closed period (before the break into the bronchus) and the open one (after the break into the bronchus).

In the first period, the period of abscess formation, which lasts several days, the symptoms are not defined well enough. For example, when the abscess is the complication of pneumonia, the patient's temperature doesn't drop with the end of pneumonia, there is fever and instead of becoming constant the temperature is of hectic nature. The pulse is rapid, the general condition of patients remains grave or worsens.

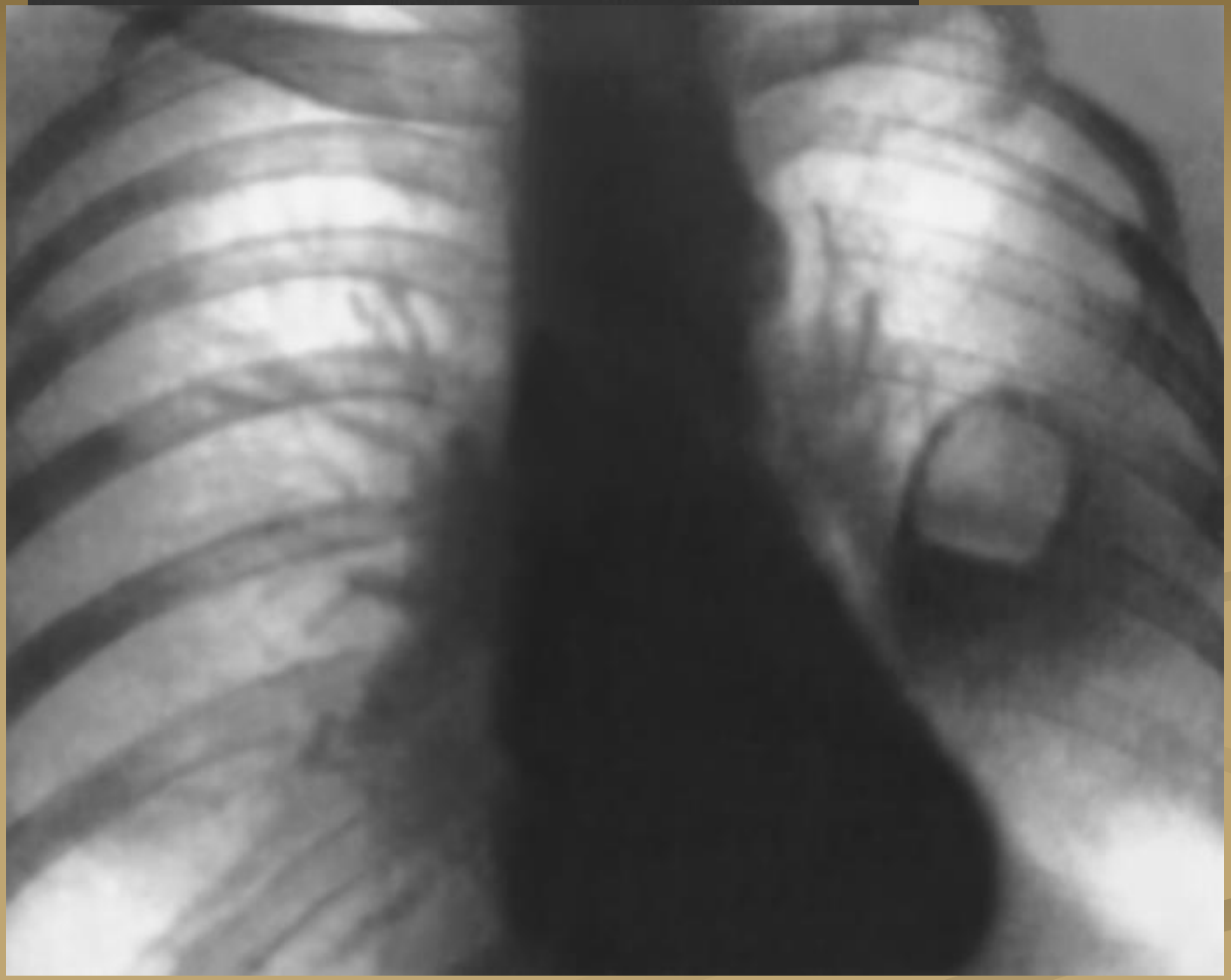
There is pain in the chest and cough, due to reactive pleurisy, increased leukocytosis, and there is a growing shift of the formula to the left. The ESR remains accelerated. The auscultation shows bronchial, weakened breathing and wheezes. The chest radiography shows that the dark patch, due to pneumonia, is becoming more limited. The percussion sound is shortened, wheezes are tapped.

- In the second period, after the abscess break into the bronchus, significant improvement in the patient's condition is observed: the temperature drops, chilling stops, appetite improves. The abscess breakthrough into the bronchus is often accompanied by coughing with sudden release of large amounts of sputum (100-500 ml). Sputum with lung abscess is usually fetid, which is due to the content of putrid flora. The daily amount of sputum is about 200-300 ml. and more.

- Typically, the settled sputum consists of three layers: the upper –frothy one, the medium - transparent and mucous one and the bottom - thick and muddy layer, containing elastic fibers, and sometimes larger pieces of lung tissue and blood cells. Hemoptysis is often observed. Bronchial breathing with an amforic tint appears. The dependence of sputum on the patient's body position is typical for lung abscesses.

- Further symptoms and the course of lung abscesses are determined by the state of bronchial drainage. In case of insufficient bronchial drainage the inflammation process runs either undulating with the change of remissions and aggravations, or gradually progresses with the increase of intoxication.

- **Acute abscess** is to be differentiated with diseases that can cause the formation of cavities in the lungs: tuberculosis, lung cancer, lung cysts, bronhiectazia, fungous infection, acute destructive pneumonia, septic embolism and pulmonary embolism complicated with pulmonary infarction.



- **Treatment** At the initial stages of the disease the treatment of acute abscesses should be comprehensive conservative. Its basic principles are as follows:

- 1) sanitation of intrapulmonary abscesses and the tracheobronchial tree;
- 2) rational antibacterial therapy;
- 3) increasing the resistance of the organism;
- 4) immunotherapy;

- 5) detoxification therapy;
- 6) correction of functional disturbances of the cardiovascular, respiratory systems and other internal organs;
- 7) symptomatic therapy.

- The patient is provided complete rest. The sanation of intrapulmonary abscesses and the tracheobronchial tree in the process of lung abscess treatment is achieved by:
  a) expectorant and mucolytic drugs;
- b) repeate sanative fibrobronchoscopies in the process of which the trachea, bronchi and the abscess cavity are lavaged with antiseptics, solutions of proteolytic enzymes, mucolytics, antibiotics;

- c) postural drainage combined with exercise therapy: in case of right-sided localization of abscesses it is recommended to position the patient on the left side, if the abscess is located in the super-posterior sections the Fowler's position is advisable for the patient (the patient's body is tilted anteriorly).

- d) transthoracal drainage of the abscess, performed under ultrasound or fluoroscopy control. It is used to treat abscesses which cannot be drained through the bronchi and are located in close proximity to the chest. The most commonly used is the transthoracic drainage combined with constant lavation and active aspiration.

- Antibiotics may be administered intramuscularly, intravenously or inhaled as an aerosol in the abscess cavity through a catheter or, selectively, in the pulmonary artery. To increase the body resistance of patients with lung abscesses enhanced enteral nutrition is indicated.

- The patients are put on a high-calorie diet with energy value of not least as 3500-4000 kcal per day. The immunotherapy includes immunomodeling and immunocorrective therapy. In cases of acute endotoxicosis extracorporal methods of detoxication, such as: hemosorbtion, plasmapheresis, lymphosorption, xenospleen connection, etc...

- The indications for surgical treatment of acute lung abscesses are large pockets of purulent-destructive lesions of lung tissue with negative effect of combined therapy.

- The pneumotomy operation consists in the opening of the abscess by incision of the thorax and lung and its draining by means of a long drainage tube, the end of which is dipped in antiseptic liquid (underwater drainage of Bulau and Subbotin. There may be a single-stage pneumotomy (if adhesions between the visceral and parietal pleura are present) and a two-stage one (if there are no adhesions).
- In the absence of adhesions they are formed artificially.

- For this purpose two ribs in the zone of abscess location are to be resected over 6-7 cm and the muscle layer between them is to be dissected. The pleura is slightly separated circumferentially. To form the adhesions, the bottom of the wound is smeared with iodine solution and tamponed with a gauze swab, the skin over the swab is not sutured. Reliable adhesions are formed within 8-10 days. After being confirmed in the presence of adhesions, a test puncture with a thick needle is made.

Then the incision is performed in the direction of the needle. A long drainage tube is introduced into the cavity and the end of it is dipped in antiseptic liquid – the underwater drainage by Bulau and Subbotin.

In recent years, this operation is less frequent, as successful drainage is achieved by using the abscess puncture through the thoracic wall by means of the trochar.

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