

**Міністерство охорони здоров'я України**  
**Харківський національний медичний університет**

Кафедра Внутрішньої медицини №3  
Факультет VI по підготовці іноземних студентів

***ЗАТВЕРДЖЕНО***

на засіданні кафедри внутрішньої медицини №3

«29 » серпня 2016 р. протокол № 13

Зав. кафедри \_\_\_\_\_ д.мед.н., професор Л.В. Журавльова

**МЕТОДИЧНІ ВКАЗІВКИ**

для самостійної роботи студентів англійською мовою

з дисципліни «Внутрішня медицина (в тому числі з ендокринологією)  
студенти 4 курсу I, II, III медичних факультетів, V та VI факультетів по підготовці  
іноземних студентів

**Інфекційно-деструктивні захворювання легень.**

Харків 2016

**Study subject** "Infectious-destructive pulmonary disease."

Skills to analyze data of laboratory tests (general and microbiological research sputum, general and microbiological examination of pleural fluid)

Research Sputum Set the nature of the pathological process in respiratory organs, and in some cases to establish its etiology.

**Research Sputum** start of its examination, it turnput on white and black background.

### **1. Determine the nature, color, consistency**

- Sputum slimy, colorless, viscous, found in acute bronchitis.
- Sero Sputum: colorless, liquid, foam, occurs in pulmonary edema.
- Mucopurulent, yellow or green, viscous, is chronic bronchitis, tuberculosis and others.
- Pus, homogeneous, liquid, greenish-yellowish- with lung abscess in breakthrough.
- bloody with pulmonary hemorrhage (tuberculosis, cancer, bronchiectasis).
- Mucopurulent intervals blood: in bronchiectasis.
- Sero-purulent foam: with pulmonary edema.
- Muco-blood: at infarct lung or stagnation in the pulmonary circulation.
- Brown: at gangrene, abscess or lung.
- Rusty color, with lobar pneumonia.

For chronic suppuration processes sputum be 3 layers: the top - muco-purulent average - serous, bottom - purulent. Sometimes sputum divided into 2 layers - serous and purulent.

### **2. Smell.**

Fetid, putrid decay of tissue (gangrene, cancer) or the breakdown of proteins sputum at his delay in the cavity (abscess, bronchiectasis).

### **3. Further signs observed in sputum**

- Spiral Kurshmana: in short the threads twisted white.
- Fibrin clots - and white branched elastic movements, which occur when fibrinous bronchitis, sometimes - with pneumonia

- "Lentil" - small greenish-yellow lumps consisting with calcification elastic fiber, and cholesterol crystals and soaps containing Mycobacterium tuberculosis
- DytryhsFuses - similar to "lentils" in appearance, but do not contain Mycobacterium tuberculosis and have malodorous smell when branching (if gangrene, abscesses, bronchitis putrefactive)
- Grainslime - observed the decay of old TB lesions
- Friends actinomycetes - small yellowish grains, like barley semolina
- Remnants of necrotic tissue and lung tumors
- Food residues

#### **4. Reaction medium.**

Sputum usually has an alkaline reaction. It becomes acidic and the decay of impurities gastric juice, which allows differential hemoptysis with bloody vomiting.

#### **5. Microscopic examination.**

Held in native as well as painted and preparations (in Petri dishes).

May find: red blood cells, white blood cells, spiral Kurshmana, Charcot-Leyden crystals, eosinophil, epithelium (flat, cylindrical flashing), alveolar macrophages (large cells - in 2-3 times higher than white blood cells).

The cells of malignant tumors often fall into sputum if endobronchial tumor grows or decays. In preparation, these cells stand their "atipizm": they are large, with a fair shape, large nucleus, and sometimes multiple nuclei.

Chronic inflammation in the bronchial epithelium that their metaplazya, acquires and atypical symptoms may resemble tumors. Therefore, to determine how tumor cells is only possible in cases of atypical and also polymorphic cells, particularly if they are located on the fibrous basis or together with elastic fibers.

Charcot-Leyden crystals, octahedrons without which different sizes, resembling the compass, consist of a protein released by the decay of eosinophil, with more of a stale sputum.

After pulmonary bleeding if the blood is released from sputum not immediately possible to find crystals formation or yellow-brown color.

For bacterioscopic smear rubbing lump sputum made substantive between two glass. The smear that has become dry, fix slow spending it 3 times through the flame gas burner and colored: search Mycobacterium tuberculosis - by Tsylyem-Nielsen, in other cases - Gram.

## **6. Research pleural fluid.**

In the cavity of a healthy person has a small amount of fluid, which is close in composition to the lymph, which facilitates slip pleura during respiration. The volume of pleural effusion may increase (effusion) as excited blood and lymph circulation in the lungs - inflammatory exudate (transudate) and inflammatory changes of the pleura (the fluid). Fluid may be caused by an infection of pleural primary clinical symptoms or concomitant with common infections and in certain diseases of the lungs and heart (rheumatism, heart attack, cancer and tuberculosis, Hodgkin's disease, etc.).

### **Research pleural liquid aims:**

- 1) to determine its nature (transudate, fluid, pus, blood, fluid hyloz);
- 2) study the cellular composition of the liquid, which makes it possible to decide on the nature of the pathological process, and sometimes (when on finding tumor cells) - and about the diagnosis;
- 3) in the case of an infectious nature identify pathogen destruction and set its sensitivity to antibiotics.

### **Analysis of pleural liquid consists of:**

- 1) macroscopic,
- 2) physical and chemical,
- 3) microscopic and, in some cases,
- 4) and microbiological
- 5) biochemical investigations.

### **The appearance of pleural fluid depends on the cellular and chemical composition:**

- Transudate and serous exudate - transparent or slightly opalescent.
- Clouding of the fluid is the presence of white blood cells (sero-purulent and purulent exudate), erythrocytes (hemorrhagic fluid) drops of fat (hyloz fluid).

The nature of the cells is determined microscopy. Hyloz determine the nature of the breakdown of the ether, the addition of which turbidity disappears.

- Color transudate pale yellow,
- Siroz exudate - from pale to golden yellow, with jaundice - to the rich yellow,
- When mixed with blood - red color or brownish gray.

- Hemorrhagic effusion, depending on the amount of blood and the period of stay in the pleura may have different color from pink to dark red and brown.
- If hemolysis effusion is lacquer look.
- Hyloz fluid resembling diluted milk.

## **7. In the study of chemical-physical determine:**

- The total density (the total density of less than 1,015 transudate, often within 1,006-1,012, the total density of exudate - more than 1,015, preferably 1,018-1,022).
- Protein in transudate is fewer than the fluid, but not more than 3% (usually 0.5-2.5%) in fluid - 3-8%.
- Composition almost protein fractions exudate such as serum; in transudate - dominated albumin, fibrinogen it almost completely tangible, so it coagulates. In fluid fibrinogen less than levels (0.05-0.1%), but enough for spontaneous collapse of most of exudates. The content of total protein in transudate often is 4-5%; in such cases differentiation it with exudate

### **Apply additional tests:**

- o - Rivalta test - with the addition of acetic acid
- o - testLukerini - with the addition of hydrogen peroxide

Both samples to determine the presence of fluid serozomutsyna - mukopolisaharydnoho complex that is missing transudatah.

## **8. Microbiologicalstudy**

Transudate usually sterile, but may be infected with many puncture.

Fluid can be steryl (eg, rheumatoid pneumonia, lung cancer). Serous fluid in the etiology of tuberculosis mycobacteria Bacterioscopicefinitionfails, but the crops adaptation punctate or guinea pigs can sometimes get positive results.

In pleurisy, which are dictated by pussy flora, it is determined by Bacterioscopic Coating method program. If not, you need to carry out sowing.

For the treatment of patients revealed bacteria tested for sensitivity to antibiotics.

### **X-ray study.**

Beginning to suspect abscess in a patient with severe pneumonia can change based on the clinical picture and physical data, but the main role in the diagnosis of lung abscesses plays X-rays, which carry preferably upright patient.

In the early period of the disease on chest X-rays can be seen segmental consolidation or equity, which becomes spherical due to the spreading manure. The appearance of one or more clarifications on the background of homogeneous eclipse the lungs indicates the formation solitary or multiple abscesses. Further multiple small cavities can merge into larger, which, after a rush abscess in the bronchus and expectoration of sputum, are beginning to determine the level of the liquid.

### **Computed tomography of lungs.**

For more information on the number and location of abscesses, as well as the appearance of concomitant pleural effusion, which is difficult to see on X-rays can be obtained at CT of the lungs. Apply as usual and computer abstsesogramm - transthoracic introduction into the cavity X-ray soluble degradation products. Location of the purulent center near the chest wall allows its puncture under ultrasound guidance.

### **Thoracoscopy.**

If empyema or pneumothorax perform thoracoscopy, which often can detect the presence of fistulas bronhoplevral, their location and size, do a biopsy of the pleura or lung to clarify the etiology of the disease.

### **Control questions.**

1. Define the abscess and gangrene of the lungs.
2. Etiology and pathogenesis of lung abscess and gangrene.
3. Classification of destructive diseases of bronchopulmonary system.
4. Clinical manifestations of lung abscess.
5. Clinical manifestations of lung gangrene.
6. Physical data in lung abscess and gangrene.
7. Additional methods with lung abscess.
8. Additional methods with gangrene of the lungs.
9. Complications of lung abscess and gangrene.
10. Chronic lung abscess and its complications.
11. Treatment of lung abscess and gangrene.
12. Indications for surgical treatment.
13. Bronchiectasis. Definition.
14. Etiology and pathogenesis of bronchiectasis.
15. Clinical manifestations of bronchiectasis.

16. Physical data in bronchiectasis.
17. Additional methods of examination of patients with bronchiectasis.
18. The differential diagnosis of infectious and destructive diseases of bronchopulmonary system.
19. Complications of bronchiectasis.
20. Treatment of bronchiectasis.

### **Practical tasks.**

1. To provide management of patients with infectious and destructive diseases of bronchopulmonary system.
2. Assess the patient's condition and results of physical examination.
3. Fill in the patient record Supervision destructive infectious disease.
4. Writing or interpreting received laboratory studies.
5. Give or interpreting received instrumental methods.
6. treatment.

### **RECOMMENDED BOOKS:**

1. Clinical Pulmonology - 2016 (The Clinical Medicine Series Book 19).-343h.
2. Pulmonary Disorders [Sect. 5, Merck manual] 2010.-123p.
3. Pulmonary Pathophysiology : The Essentials by (author) [John B. West](#) 2012 .-20
4. Davidson's Principles and Practice of Medicine 22nd Edition .-Walker, Brian R., FRSE.-2014.-1312p.

Website of the departament: <http://www.vnmed3.kharkiv.ua/>,

Методичні вказівки склав: доц.. Федоров В.О.

Методичні вказівки переглянуто і затверджено на засіданні кафедри: 31 серпня 2016р. протокол №13.

З доповненнями (змінами).

Завідувач кафедри  
внутрішньої медицини №3  
д.м.н. проф..

Журавльова Л.В.