

Ministry of Health of Ukraine
Poltava State Medical University
Department of internal medicine No 3 with phthisiology

Approved
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Medicine No. 3 with Phthisiology
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Methodical instructions
for the independent work of students
during the preparation for a practical lesson and in class

Academic discipline	Phthisiology
<i>Modul №</i>	1
Theme of the lesson 4	Methods of radiological diagnosis of tuberculosis. Curation of patients.
Course	4
Faculty	International
Specialty	Medicine

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1. Topicality of the theme: In the conditions of epidemic of tuberculosis to every doctor, regardless of specialty, it is necessary to know not only the first displays of tuberculosis beginning from complaints, features of development of illness and information of objective inspection but also methods of it radiology diagnostics.

Radiology research one of basic methods of diagnostics of tuberculosis and his active exposure at the mass surveys of population. This method of diagnostics TB is not specific in discovered tuberculosis, but does not lose the value this and widely utilized in diagnostics of tuberculosis.

2. Specific objectives:

To draw: schematically structure of lungs (parts and segments)

To analyze: value of different methods x-ray diagnostics of tuberculosis

To explain: aims uses of methods radiology inspection

To classify: shadow is characteristic for tuberculosis at x-ray inspection of lungs

To interpret: results of radiological inspection

To analyze: pathological changes which can be found out at radiological inspection

To make: plan of radiological inspection

3. Base knowledge, abilities, skills, are necessary for study themes (interdisciplinary integration)

Names of previous disciplines	Skills are got
Anatomy	Structure of lungs, parts and segments
Radiography	Projection of stakes, segments of lungs on x-ray inspection. Radiologic signs of lungs TB.

4. Task for independent work during preparation to employment

4.1. List of basic terms, parameters, descriptions which a student must master at preparation to employment:

Term	Determination
Sciagram	It is summation of shadows of organs of pectoral cavity in platness image on x-ray graph tape.
Focal shade	it is pathological shade which has sizes less than 10 mm
Infiltration shade	it is pathological shade which has sizes more than 10 mm
Cavity	It is ring-like shade is reserved.
Computer tomography	It is special technology radiography inspection

4.2. Theoretical questions are to employment:

1. List the required and optional methods of X-ray examination with suspected TB.
2. What shade characteristic of tuberculosis and their characteristics?
3. What are the radiological signs of active TB.
4. Name the phase TB process that set the X-ray.
5. What is the sequence reading radiographs?

4.3. Practical works (task) which execute on employment: Initial level

1. What x-ray method is used for the survey of population with the purpose of exposure of tuberculosis of breathing organs?
A. Sciagraphy. B. Computer tomography. C. Flyuorography. D. Rentgenoskopy. E. Bronkhography.
2. What method is applied for control by the dynamics of efficiency treatments consumptive lungs?
A. Sciagraphy. B. Rentgenokimography. C. Flyuorography. D. Rentgenoskopy. E. Bronkhography.
3. What method is utilized for more precise locating of shade in the layer of pulmonary tissues?
A. Sciagraphy. B. Computer tomography. C. Flyuorography. D. Rentgenoskopy. E. Bronkhography.
4. What method more frequent will be used for the exposure of destruction of pulmonary tissues?
A. Sciagraphy. B. Tomography. C. Aiming sciagraphy. D. Rentgenoskopy. E. Bronkhography.
5. What x-ray method do inspections begin with, if at a prophylactic photofluorographic inspection in lungs found out foci shades?
A. From survey sciagraphy. B. From computer tomography. C. From aiming sciagraphy. D. From radioscopy. E. From bronchography.
6. What method does give the detailed information about a structure and homogeneity of shade in lungs?
A. Tomografiya. B. Computer tomography. C. More precise sciagraphy. D. Rentgenoskopy. E. Bronkhography.
7. What from the transferred methods of research of breathing organs is not a x-променевим?
A. Sciagraphy. B. Computer tomography. C. Rentgenoskopy. D. Bronchography. E. Bronchoscopy.
8. What criteria of optimum inflexibility of sciagram?
A. On to the sciagram expressly evidently the first three-four pectoral vertebrae.
B. On to the sciagram evidently contours of shoulder-blades.
C. On to the sciagram expressly evidently first six-eight pectoral vertebrae.
D. On to the sciagram expressly evidently ribs.
E. On to the sciagram expressly evidently breastbone.
9. Whatever components of tissues of lights are invisible on a sciagram?
A. Radix of the lungs B. Big vascular barrels. C. Wall bronchial tubes. D. Teethridges.
E. Lungs interstitium.
10. What top limit of norm of width of root is lungs?
A. 1-1,5 cm B. 2,5 of cm C. 3,5 cm D. 5 cm E. 7,5 cm

11. What form does a normal root have lungs?
- A. Obtuse corner, opened aside pulmonary field.
 - B. Triangle, by an apex turned to middle shade.
 - C. Sectoral circles. D. Rectangle. E. Complex polycyclic figure.

Theme contents:

X-RAY METHODS OF DIAGNOSTICS TB

Modern radio-therapy has large diagnostic possibilities. In a phthisiology for the inspection of patients utilize obligatory and additional roentgenologic inspections. Obligatory roentgenologic methods are: a survey sciagram of organs of pectoral cavity is in direct and lateral projections. Additional roentgenologic inspections it: x-ray examination, tomography (TG), bronchography, lateroposition, fistulography, angiopulmonography, computer tomography (KTG).

Adults have mass **prophylactic fluorography**, individual prophylactic fluorography inspection the methods of early exposure of tuberculosis after an appeal, decreed contingents, persons from the groups of risk that **backterioscopy of stroke of sputum** patients which cough 3 weeks and anymore.

Mass prophylactic флюорографию is conducted in the planned order with the continuous (100%) scope of population 1 time per 2 years, since 15-years-old age. Carry out its movable and stationary fluorography.

Stationary fluorography functions at polyclinics, hospital, ant tubercular dispensaries. They are utilized for the annual inspection of groups of clinical account, decreed (obligatory) contingents and persons which appealed for a medical help first during a year.

Sciagram of OPC – it is summation shad of organs of pectoral cavity in a flatness image on x-ray photography tape. The basic requirements to sciagraphy it is a receipt of high-quality sciagram on which the pulmonary fields must be expressly represented with a pulmonary picture, roots of lungs, organs of mediastinum, bone frame and pectoral vertebrae.

The sequence of reading of sciagram is foreseen by description of the pulmonary fields. In a norm the left lung already and more longer after to the right, and the organs of mediastinum are no communicative between the internally ends of collar-bones on a background shade of breastbone and spine. Diminishing of the pulmonary field is observed at: hydrothorax, haemathorax, pneumothorax, atelectasis, cirrhosis and fibrotic-cirrhotic changes of lungs. Expansion of the pulmonary field is marked at emphysema of lungs.

The organs of mediastinum are located on a middle, displacement them takes a place toward a defeat at fibrous-cavern, cirrhotic tuberculosis. In a healthy side diagnose displacement of organs of mediastinum at hydro-, pussy-, pneumothorax.

A pulmonary picture is formed the vessels of lungs. Strengthening of him finded at heterospecific inflammatory processes (pneumonia, bronchitis), and also at left ventricle insufficiency. Weakening lungs a picture it can be contingently the presence of focal, infiltration shads of middle and high intensity. Absence lungs a picture observed at hydro-, pussy-, pneumothorax.

The pulmonary field in a norm is transparent and does not have pathological shads.

Pathological shads at tuberculosis can be placed in any areas of lights, but more frequent than all they are localized in 1, 2 or 6 segments.

For tuberculosis there are the characteristic followings shades:

- **focal;**
- **infiltration;**
- **ring-like;**
- **fibrous.**

Focal shade has sizes less 10 mm Morphological substratum of this shade there is a tubercular tubercle with lymphoid-macrophages cages. After sizes focal shades are divided on:

- small are 1-2 mm;
- middle-sized are 3-5 mm;
- big are 6-10 mm

Focal of shade characterize after the followings signs:

- intensity (high, middle, low);
- contours (clear, unclear or washed out);
- structure (homogeneous or heterogeneous);
- connection with a root lungs;
- sizes.

Infiltration shade is shade which has sizes more than 10 mm Can appear independently, or due to confluence a few Focal shades. Characterize infiltration shade after those signs, what focal, except for sizes.

Cavity – it ring-like shade is reserved.

After sizes divided on:

- small – to 2 cm in a diameter
- middle – 2-4 cm in a diameter
- large – 4-6 cm in a diameter
- giant – more than 6 cm in a diameter

For the remoteness of education and the structure of wall is select fresh and old cavities. A fresh cavity has a thin wall, regular shape, clear internal and the external is washed out contours. An old cavity has a thick wall, wrong form (prolate, round-up), due to fibrotic changes, clear external and internal contours.

Fibrotic changes appears as a result of replacement pulmonary tissue of fibrous, shade will be middle and high intensity as linear shadows and «weeping willow».

X-ray diagnose the phases of tubercular process. Select the followings phases:

- a) making progress (infiltration, destruction, dissemination);
- б) recovery (resolve, scarring, compression, calcination).

The phase of infiltration is answered by the presence of shade (focal or infiltration) of low intensity, homogeneous structure without clear contours.

For the phase of destructive the presence of cavity or focal or infiltration shade of heterogeneous structure is characteristic. At tuberculosis the area of disintegration is located eccentrically, nearer to the draining bronchial tube; at a tumor disintegration is in a center shade.

For the phase of dissemination distribution of MBT is characteristic lymphogenic, haematogenic and bronchogenic in pulmonary tissue (possibly after their limits), and formation of new areas of tubercular inflammation.

Description of the pulmonary fields, organs of mediastinum, pathological shades establishment x-ray of diagnosis is completed.

X-ray a diagnosis includes at tuberculosis: clinical form of tuberculosis, phase of process, localization (lung, lobe, segments).

Materials are for self-control:

A. Task for self-control (tables, charts, pictures, graphic arts):

B. Task for self-control

1. A patient is 67 years. Suddenly felt sharp pain in the right half of thorax. The shortness of breath grows, there is cyanosis. Percussion above a right lung tympanic is determined, not hearkened to breathing, a heart and organs of mediastinum is sharply displaced to the left. Previous diagnosis: right-side spontaneous pneumothorax.

What x-ray research can confirm a diagnosis?

2. For the patient of 24th first found out foci tuberculosis of the first and second segment of left lung of doubtful activity.

How often must a patient be inspected x-ray?

3. For the patient of 30 years in the second segment of right found out lungs a photofluorographic method the rounded focus of darkening of small intensity with the washed out contours.

What roentgenologic inspection does need to be appointed for more precise of presence of destructive changes?

4. The man of 45 years returned from the places of imprisonment. It was x-ray inspected 1,5 years ago. Complaints are not.

What roentgenologic inspection does need him to appoint?

Literature

Basis:

1. Phthisiology : a teaching manual / B.F. Moskalenko, V.I. Petrenko, G.O. Timoshenko – Kiev: Medicina, 2012. – 216 p.
2. Phthisiology : textbook / V.I. Petrenko, O.K. Asmolov, M.G. Boyko [et al.] ; edited by V.I. Petrenko. – Kiev : AUS Medicine Publishing, 2015. – 416 p.

Supplementary

1. Tuberculosis : manuel for teacher, students and doctors / A.G. Yareshko, M.V. Kulish. – Poltava : Poltava Literator, 2011. – 156 p.

Information resources

1. Childhood TB for Healthcare Workers: an Online Course. – Access mode: <https://childhoodtb.theunion.org/courses/en>
2. WHO: tuberculosis. – Access mode: <http://www.who.int/tb/en/>