

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
Харківський національний медичний університет

SYSTEMIC PATHOLOGIC ANATOMY

*Manual for practical classes in pathomorphology
for English-speaking teachers*

СИСТЕМНА ПАТОЛОГІЧНА АНАТОМІЯ

*Методичні розробки
до занять з патоморфології
для англomовних викладачів медичних закладів*

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Системна патологічна анатомія : метод. розроб. до занять з патоморфології для англومовних викладачів мед. закладів / упоряд. І. В. Сорокіна, В. Д. Марковський, І. В. Корнейко та ін. – Харків : ХНМУ, 2017. – 72 с.

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Foreword

Pathomorphology, one of the most important medical subjects is aimed at teaching students understanding material basis and mechanisms of the development of main pathological processes and diseases.

This manual published as separate booklets is devoted to general pathological processes as well as separate nosological forms. It is intended to the English-medium students of the medical and dentistry faculties. It can be used as additional material for teachers used in class. It can also be used to master the relevant terminology and its unified teaching.

The manual is based on the syllabuses in Pathomorphology for Medical Students (2015).

For a practical class of 2 hour duration the following time calculation is recommended:

1. Greeting of students and check of students presence, topics substantiation – 5 min
2. Determining the primary level of the knowledge – 5 min.
3. Independent work of the students – 50 min.
4. Determining the final level of the knowledge – 20 min.
5. Checking the protocols of the practical class and attestation of the students – 10 min.

The suggested Manual allows to organize the teaching process in the proper way.

References:

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Lesson

Diseases of Hematopoietic System

Validation of the subject: The knowledge of pathology of hematopoietic organs is essential for successful understanding of the tumors of hematopoietic and lymphatic tissue and anemia, studying clinical subjects and for clinical-anatomic analysis.

Objectives of the lesson: to discuss the etiology, pathogenesis, classification, morphological characteristics, complications, causes of death, pathomorphosis of hemoblastoses and anemia and have to be able to differentiate them according to the morphologic features.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- diagram of hematopoiesis,
- classification of hemoblastoses,
- classification of anemia

Colour pictures:

- pathological anatomy of acute, chronic leukemia and Hodgkin's disease

Slides:

- liver in chronic myelocytic leukemia,
- liver in chronic lymphocytic leukemia,
- lymph node in Hodgkin's disease.

Macrospecimens:

- organ complex in acute leukemia,
- necrotic quinsy,
- bone marrow of the tubular bone in acute leukemia,
- bone marrow of the femur in chronic lymphocytic leukemia,
- packages of the lymph nodes in chronic lymphocytic leukemia,
- spleen in chronic myelocytic leukemia,
- bifurcation and mesenteric lymph nodes in Hodgkin's disease,
- spleen in Hodgkin's disease,
- bone marrow of the tubular bone in chronic posthemorrhagic anaemia;

Microspecimens:

- # 219 – liver in chronic myelocytic leukemia,
- # 221 – liver in chronic lymphocytic leukemia,
- # 134 – Hodgkin's disease

Electronogram:

– myeloma cell

Questions to control basic knowledge:

1. Is leukemia a tumor?
2. Indicate which of the following attributes are based on division of leukemia into acute and chronic; a) change in the amount of leukocytes in peripheral blood, b) degree of differentiation of tumor cells, c) growth rate of cells, d) blast crisis, e) occurrence of the tumor cells in peripheral blood, f) duration of the course.
3. What is the name of leukemia in which the peripheral blood is not changed: a) leukemic, b) subleukemic, c) leukopenic, d) aleukemic.
4. Which forms of leukemia are: 1) acute, 2) chronic; a) myelocytic, b) lymphoblastic, c) myeloblastic, d) lymphocytic.

Answers: 1 – yes. 2 – b. 3 – d. 4 (1d, 1c); 4 (2a, 2d).

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Give definition of hemoblastoses.
2. Give definition of leukemia, what is the difference between leukemia and leukocytosis.
3. What factors allow to define leukemia as acute or chronic?
4. Name histo- (cyto-) genetic classification of acute and chronic leukemia; the difference between them.
5. What is the difference in hemo- and myelogram in acute and chronic leukemia?
6. Pathological anatomy of acute and chronic leukemia.
7. Complications and causes of death in leukemia.
8. Pathomorphosis of leukemia.
9. The signs of leukemia in children.
10. Classification of lymphoma. Hodgkin's disease.
11. Anemia, its types.
12. Pathological anatomy of anemia.

Macrospecimens:

1. *Organ complex in acute leukemia:* Pay attention to microfocal haemorrhage on the skin. Describe the ulcerative defects in the oesophagus mucosa, haemorrhage in the brain, the packages of the lymph nodes. Explain haemorrhagic diathesis in acute leukemia.

2. *Necrotic quinsy:* The appearance of the tonsils, their size and colour. What are the causes of development of necrotic changes on the gastrointestinal tract in acute leukemia?

3. *Bone marrow of the tubular bone in acute leukemia*: Pay attention to the replacement of the yellow bone marrow by red one. What is the pathogenesis?

4. *Bone marrow of the femur in chronic lymphocytic leukemia*: Pay attention to yellow-green colour of the marrow. How can "pyoid" marrow be explained?

5. *The packages of the lymph nodes in chronic lymphocytic leukemia*: Describe the size of the lymph nodes, their appearance on section. Explain the enlargement of the lymph nodes.

6. *Spleen in chronic myelocytic leukemia*: the size, color, condition of the capsule; availability of cicatrices from previous infarctions in it. The cause of the spleen enlargement.

7. *Bifurcate and mesenteric lymph nodes in Hodgkin's disease*: Pay attention to the size of the lymph nodes, their color and condition of the tissue on section. Name the stages of Hodgkin's disease.

8. *Spleen in Hodgkin's disease*: Describe the size and color of the organ on section. How is spleen in Hodgkin's disease called?

9. *Bone marrow of the tubular bone in chronic posthemorrhagic anemia*: Pay attention to the replacement of the yellow bone marrow with red bone marrow. What is it connected with. What does the appearance of such marrow remind?

Microspecimens:

219 – *liver in chronic myelocytic leukemia* (stained with hematoxylin and eosin). At low magnification find diffuse growth of leukemia cells in the liver lobule and portal tract. At large magnification study infiltrate cells, determine the type of hepatocyte degeneration. What are hemo- and myelograms in the patients with chronic myelocytic leukemia?

221 – *liver in chronic lymphocytic leukemia* (stained with hematoxylin and eosin). Determine the localization of leukemia infiltrates along the portal tract. At large magnification study leukemia infiltrate, establish the type of hepatocyte degeneration. What are hemo- and myelograms in the patients with chronic lymphocytic leukemia characterized by?

134 – *lymph node in Hodgkin's disease* (stained with hematoxylin and eosin). Under low magnification pay attention to the erased picture of the lymph node, at large magnification study infiltrate cells, find Reed-Sternberg cells. Name histological variants of Hodgkin's disease.

Electronogram:

Myeloma cell. Pay attention to expansion of endoplasmatic reticulum canals filled with paraprotein. What group of leukemia does multiple myeloma belong to? Name the types of multiple myeloma according to its localization. Name histological variants of multiple myeloma.

Control final knowledge:

Krok problem test

1. A tumor was found in the locus of a pathological fracture of a rib in a male patient. The case history contained information about persistent proteinuria with presence of abnormal proteins of Bence-Jones type, as well as presence of osteolytic foci in the bones of the spine, skull and pelvis. Histologically, the tumor cells were represented by plasmablasts and plasmacytes. What is your diagnosis?

- A. *Primary macroglobulinaemia*
- B. *Heavy-chain disease*
- C. *Osteosarcoma*
- D. *Multiple myeloma**
- E. *Fibrosarcoma*

2. Thoracotomy in a 55-year-old male patient revealed a packet of lymph nodes in the anterior mediastinum; a biopsy was taken from one of them. Microscopically, there were infiltrates consisting of lymphocytes, histiocytes, eosinophils and Reed-Sternberg multinuclear cells which were surrounded by vegetations of a fibrous connective tissue. Name the clinical-morphological form of lymphogranulomatosis.

- A. *Lymphogranulomatosis with suppression of the lymphoid tissue*
- B. *Mixed-cell variant of lymphogranulomatosis*
- C. *Lymphogranulomatosis, nodular sclerosis**
- D. *Lymphogranulomatosis with prevalence of the lymphoid tissue*

3. In a 45-year-old patient the ulcerative-necrotic damage of the mucosa of the oral cavity takes place; also the spread lymphadenopathy, slight spleno- and hepatomegaly, diffuse hemorrhages in the skin and mucous membranes were found out. In blood analysis the increasing of leukocytes (to 100 10 per 1 ml) at the account of lymphoblasts takes place. What diagnosis is more probable?

- A. *Acute lymphoblastic leukemia**
- B. *Chronic myelocytic leukemia*
- C. *Chronic lymphocytic leukemia*
- D. *Plasmocytosis*
- E. *Acute promyelocytic leukemia*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Atherosclerosis. Ischemic Heart Disease (IHD)

Validation of the subject: The knowledge of the present subject is essential for learning heart and vascular diseases, hypertension, diabetes mellitus both at theoretical and clinical departments, for clinicoanatomical analysis of autopsy material in the practical work.

Objectives of the lesson: To discuss how to detect etiological factors, pathogenesis, to explain morphology and morphogenesis of atherosclerosis, its main clinico-morphologic forms, periods and complications.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- the etiology and pathogenesis of atherosclerosis;
- different types of atherosclerosis and its morphogenesis;
- clinico-morphological forms of atherosclerosis;
- ischemic heart disease: its causes, forms, outcomes;
- myocardial infarction;
- chronic IHD – forms, outcome.

Coloured tables:

- atherosclerosis of cerebral, coronary vessels, those of the kidney and intestine;
- myocardial infarction;
- white brain infarct;
- gangrene of the intestine;
- gangrene of the foot.

Slides:

- atherosclerosis of the aorta;
- atherosclerosis of the coronary artery;
- myocardial infarction;

Macrospecimens:

- atherosclerosis of the aorta;
- atherosclerotic aortic aneurysm with thrombus;
- dissecting aortic aneurysm;
- atherocalcinosis of the aortic arch;
- atherosclerosis of the arteries of the brain base;
- stenosing atherosclerosis of the coronary artery with thrombosis, acute myocardial infarction, complicated by development of acute mural aneurysm with its rupture;

- chronic aneurysm of the heart with parietal thrombus;
- gangrene of the foot.

Microspecimens

- # 186 – aortic lipoidosis;
- # 185 – atherosclerosis of the coronary artery;
- # 184 – necrotic stage of myocardial infarction.

Electronograms:

- myocardial infarction,
- stage of ischemia

Questions to control basic knowledge:

- 1) Is atherosclerosis a frequent disease in the population of Africa and Asia?
- 2) Indicate the main etiologic factors of atherosclerosis: a) hypoxia, b) abnormal fat metabolism, c) stress, d) arterial hypotension, e) hereditary factors, f) hormonal factors, g) arterial hypertension, h) infectious diseases.
- 3) Name the stages of atherosclerosis pathogenesis: a) hyalinosis, b) atheromatosis, c) plasmorrhagia, d) lipoidoses, e) pre-lipid stage, f) atherocalcinosis, g) thrombosis.
- 4) On the basis of which diseases does ischemic heart disease develop: a) rheumatism, b) anemia, c) atherosclerosis, d) pneumonia, e) hypertensive disease, f) diabetes mellitus.
- 5) Morphological manifestations of chronic IHD are: a) postinfarction cardiosclerosis, b) myocarditis, c) microfocal cardiosclerosis, d) repeated myocardial infarction.

Answers: 1 – no. 2 – b, c, f, g. 3 – b, d, e, f. 4 – c, e, f. 5 – a, c.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

- 1) Define the term “atherosclerosis”.
- 2) Name the types of atherosclerosis.
- 3) Name the etiologic factors of atherosclerosis.
- 4) What are the theories of atherosclerosis pathogenesis.
- 5) What is the morphogenesis of atherosclerosis? Characterize its changes.
- 6) Name the clinical periods and stages of atherosclerosis.
- 7) Name the clinico-morphological forms of atherosclerosis, their complications and causes of death.
- 8) Define the term “ischemic heart disease”, name its pathogenetic factors.
- 9) Characterize chronic ischemic heart disease.
- 10) Name the causes of myocardial infarction.
- 11) What are the morphology, stages and outcomes of myocardial infarction?

Macrospecimens:

1. *Atherosclerosis of the aorta*. Pay attention to the thickness relief, color of the aortic intima, the condition of the lumen, the elasticity of the vascular wall. Name visual manifestations of atherosclerosis.

2. *Atherosclerotic aortic aneurysm with thrombus*. Pay attention to the form of aneurysm, the condition of the intima of the adjacent parts. Name the causes of thrombogenesis and possible complications in this case.

3. *Dissecting aortic aneurysm*. What is the danger of this pathology? Name the mechanism of complications.

4. *Atherocalcinosis of the aortic arch*. How can we diagnose this pathology intravitaly (during the patient's life)? Name the possible clinical signs.

5. *Atherosclerosis of the arteries of the brain base*. Pay attention to the thickness of the walls, condition of the lumen, winding pathways of vessels. What is the cause? Name the main clinical manifestations of these changes.

6. *Stenosing atherosclerosis of the coronary artery with thrombosis, acute myocardial infarction complicated by development of acute mural aneurysm and its rupture*. Pay attention to the condition of the myocardium in the infarction zone. What is the name of this disease and its lethal complications?

7. *Chronic aneurysm of the heart with parietal thrombus*. How can we call the basic disease? What are the causes and role of thrombogenesis in this case?

8. *Gangrene of the foot*. Pay attention to the color of the soft tissues. What is the cause of the gangrene and what is the cause of darkness of the soft tissues?

Microspecimens:

186 – *aortic lipoidosis* (stained with Sudan III). Pay attention to the infiltration of the intima with lipids. Find the accumulation of xantomatous cells.

185 – *atherosclerosis of the coronary artery* (stained according to Van-Gieson). Using low magnification find the plaque with lipo-protein detritus, covered with connective tissue in the center. Evaluate the state of the lumen. How is it connected with the clinical state of the patient?

184 – *necrotic stage of myocardial infarction* (stained with hematoxylin and eosin). Pay attention to the structureless part nuclearless muscular fibers with rough basophilia of the stroma and massive leukocytic infiltration. Name possible outcomes of these changes in the heart.

Study the electronogram:

Myocardial infarction, stage of ischemia. Pay attention to the rough swelling and vacuolization of mitochondria with destruction of the crusts.

Control final knowledge:

Krok problem test

1. On autopsy of a 68-year-old male, who died from cardiac decompensation, the myocardium of the anterior wall in left ventricle of his heart contained an irregular grey focus, 5×4 cm in size, with a dense consistency, fibrous structure and clear borders. What pathological process in the myocardium did the pathologist reveal?

- A. *Myocarditis*
- B. *Microfocal cardiosclerosis*
- C. *Infarction*
- D. *Postinfarction cardiosclerosis**
- E. *Rheumatism*

2. An autopsy of a 38-year-old male, who died in a car accident, revealed in his aorta some yellow-grey spots and stripes which did not rise above the surface of the intima. Microscopically, the intima had an abundant deposition of proteins, plasma, fibrin, GAG, cholesterol, low-density lipoproteins; the endothelium had foci of affection. Name the stage of morphogenesis of atherosclerosis.

- A. *Prelipid*
- B. *Lipoidosis**
- C. *Liposclerosis*
- D. *Atheromatosis*
- E. *Atherocalcinosis*

3. A 65-year-old patient, who suffered from arteriosclerosis, has been hospitalized in surgical department because he had purulent peritonitis. Thrombosis of mesenteric arteries was found during operation. What is the form of atherosclerosis takes place?

- A. *Atherosclerosis of mesenteric arteries**
- B. *Atherosclerosis of brain*
- C. *Atherosclerosis of kidney's arteries*
- D. *Atherosclerosis of coronary arteries*
- E. *Atherosclerosis of extremities*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Hypertension

Validation of the subject: The knowledge of this subject is essential for learning heart and vascular diseases in the clinical departments, for clinicoanatomical analysis of sectional material in practical work.

Objectives of the lesson: To discuss etiology, pathogenesis, morphology of the clinico-morphologic forms of hypertension, their complications and outcomes.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- etiopathogenesis of hypertensive disease;
- stages of the hypertensive disease;
- clinicoanatomical forms of hypertensive disease;
- complications and causes of death.

Coloured tables:

- concentric and excentric myocardial hypertrophy;
- cor bovinum (the great hypertrophic heart);
- myocardial infarction;
- cerebral infarction;
- arteriosclerotic nephrosclerosis.

Slides:

- arteriolosclerotic nephrosclerosis;
- ischemic cerebral infarction.

Macrospecimens:

- cor bovinum;
- concentric and excentric myocardial hypertrophy of the ventricle;
- atherosclerosis of the aorta;
- atherosclerosis of the coronary vessels;
- atherosclerosis of the cerebral vessels;
- myocardial infarction;
- granular kidney;
- cerebral hemorrhage;
- cysts in the brain.

Microspecimens:

#189 – gray softening of the brain;

#192 – arteriosclerotic nephrosclerosis.

Electronogram:

– spasm of the arteries in hypertension

Questions to control basic knowledge:

- 1) Is hypertension an independent disease?
- 2) What are the main factors in development of hypertension? a) infection, b) psychoemotional overstrain, c) starvation, hereditary factors, e) excessive content of NaCl in the food.
- 3) What can cause symptomatic hypertension: a) cerebral diseases, b) lung diseases, c) tumors of adrenal gland, d) kidney diseases, e) liver diseases, f) tumors of gastrointestinal tract?
- 4) What are stages of development of hypertension? a) pre-lipid, b) liposclerosis, d) pre-clinic, e) atheromatosis, f) stage of generalized changes in the vessels, g) stage of changes in the organs.
- 5) What are morphological changes of arterioles during hypertensive disease? a) lipoidosis, b) elastofibrosis, c) liposclerosis, d) plasmatic saturation, e) atheromatosis, f) hyalinosis, g) fibrinoid necrosis.

Answers: 1 – yes. 2 – b, d, e. 3 – a, c, d. 4 – c, e, f. 5 – b, d, f, g.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Define the term “Hypertensive disease”.
2. Define the term “Symptomatic hypertension”.
3. Name the types of symptomatic hypertension.
4. What are stages and variants of the development of hypertensive disease?
5. What are clinico-morphological manifestations of hypertensive disease?
6. Name the morphological changes in arterioles in hypertensive disease.
7. Characterize the morphology of acute and chronic (secondary) changes in the organs in hypertensive disease?

Macrospecimens:

1. *Cor bovinum*. Pay attention to the enlargement of the heart, the thickness of the ventricle walls, the condition and size of the cavities. What process caused these changes?

2. *Arteriosclerotic nephrosclerosis*. Pay attention to the appearance, size and surface of the kidney, the thickness of the cortical layer on section. What process caused these changes in the kidney parenchyma? What is the cause of this process? Give the synonym of arteriolosclerotic nephrosclerosis. What is the cause of the death?

3. *Cerebral hemorrhage*. Find the location, size of the hemorrhage. What is the mechanism of the hemorrhage? What are its possible outcomes?

Microspecimens:

192 – *arteriosclerotic nephrosclerosis* (stained with hematoxylin and eosin). Using low magnification pay attention to the width of arteriole walls with its homogenization and acute stenosis of the lumen. There is marked lymphohistiocitis infiltration.

189 – *gray softening of the brain* (stained with hematoxylin and eosin). Pay attention to the defect of the brain tissue, which is filled with large cells, containing eosinophil granular cytoplasm and occasionally loaded with amorphous pigments. What is the cause of these changes and their outcome? How is the brown pigment called? What is the mechanism of its formation?

144 – *myocardial hypertrophy* (stained with hematoxylin and eosin).

197 – *cardiosclerosis* (stained according to Van-Gieson)

Electronogram:

Spasm of arteriole in hypertensive disease. Pay attention to the sharp narrowing of the lumen.

Control final knowledge:

Krok problem test

1. Against a background of hypertensive crisis, a male patient with hypertensive disease developed acute renal insufficiency which caused his death. What morphological changes in the renal arterioles were the most probable?

- A. *Stenosing atherosclerosis*
- B. *Hyperelastosis*
- C. *Fibrinoid necrosis**
- D. *Hyalinosis*
- E. *Sclerosis*

2. A 56-year-old male patient with elevated blood pressure (250/120 mm Hg) died from an impairment of his cerebral circulation. An autopsy of the brain revealed a red focus in the thalamus, 2.5 cm in diameter, which sank on section. Microscopically, there was fibrinoid necrosis of the vascular walls and impregnation of the necrotized brain tissue with blood. Which of the diagnoses listed below was the most probable?

- A. *Cerebral haematoma*
- B. *Haemorrhagic infarct of brain**
- C. *Anaemic infarct of brain*
- D. *Mixed infarct*

3. The patient has suffered with hypertensive disease for a long period and died with signs of cardiac and vascular insufficiency. What macroscopical changes and in which parts of the heart can be found during autopsy?

- A. *Hypertrophy of left ventricle**
- B. *Hypertrophy of right ventricle*
- C. *Brown atrophy of myocardium*
- D. *Sclerosis of mitral valve*
- E. *Fibrinous pericarditis*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Systemic Diseases of Connective Tissue With Immune Disturbances (Rheumatic, Collagen diseases)

Validation of the subject: the knowledge of pathological anatomy of rheumatic diseases and their clinico-anatomical forms is necessary to study the diseases of cardiovascular system in clinical departments as well as in practical activity of the physician.

Objectives of the lesson: to discuss the etiology, pathogenesis, pathological anatomy, outcomes, complications of rheumatic diseases, to know their classification; to learn to distinguish them, to know the morphological characteristic of each disease. During the lesson it is necessary to give definition of rheumatic diseases, to name characteristic changes in the connective tissue in these diseases, have to be able to diagnose the forms of rheumatic endo-, myo-, pericarditis, to diagnose pseudorheumatism, systemic lupus erythematosus, to explain the causes of death.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids:

Annotated tables:

- classification of rheumatic endocarditis
- systemic lupus erythematosus
- visceral signs of rheumatic disease

Coloured tables:

- Aschoff-Talalayev granuloma

Slides:

- acute verrucous endocarditis
- productive nodular myocarditis
- skin in systemic lupus erythematosus
- glomerulonephritis in lupus erythematosus
- “nutmeg” liver
- brown induration of the lungs

Macrospecimens:

- acute verrucous endocarditis
- recurrent verrucous endocarditis
- fibroplastic endocarditis
- concentric hypertrophy of the heart
- stenosis of the ostium of the mitral orifice

- “nutmeg” liver
- brown induration of the lungs
- fibrinous pericardium
- glomerulonephritis in lupus erythematosus

Microspecimens:

- # 181 – acute verrucous endocarditis
- # 183 – productive nodular rheumatic myocarditis
- # 26 – glomerulonephritis in lupus erythematosus
- # 27 – periarterial sclerosis of the spleen

Electronogram:

- immune complexes in the skin in systemic lupus erythematosus
- glomerulonephritis in lupus erythematosus

Questions to control basic knowledge:

1. Is affection of the connective tissue characteristic for rheumatic diseases?
2. What diseases from the listed below belong to the rheumatic group:
 - a) atherosclerosis, b) idiopathic hypertension, c) Bekhterev's disease,
 - d) systemic lupus erythematosus, e) dermatomyositis, f) pseudorheumatism,
 - g) nodular periarteritis.
3. Name the types of endocarditis according to the localization: a) atrial, b) valvular, c) chordal, d) parietal, e) vascular.
4. Name the clinico-anatomical forms of rheumatic disease: a) acute, b) cardiovascular, c) chronic, d) polyarthritic, e) congenital, f) cerebral, g) nodular.
5. What changes in the heart from the listed below belong to rheumatic disease:
 - a) myocarditis, b) pericarditis, c) nodular productive, d) diffuse interstitial exudative, e) serous, f) focal interstitial exudative, g) fibrinous.

Answers: 1 – yes, 2 – c, d, e, f, g. 3 – b, c, d. 4 – b, d, f, g. 5 – 1) a, b, d; 2) c, e.

Stages of individual work in class:

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. What diseases are considered rheumatic ones?
2. Name the phases of disorganization of the connective tissue in rheumatic diseases.
3. What types of rheumocarditis are distinguished according to the localization of the process?
4. Name the types of rheumatic endocarditis.
5. Name the forms of myocarditis in rheumatic disease.
6. List the types of pericardites.
7. The features of rheumatic diseases in children.
8. Clinico-anatomical forms of rheumatic disease.
9. Complications of rheumatic diseases and causes of death.
10. Pathological anatomy and causes of death in rheumatoid arthritis.
11. Pathology and outcome of systemic lupus erythematosus.

Macrospecimens:

1. *Acute verrucous endocarditis*. Describe the cusps of the mitral valve; the appearance, size of the plaques on the surface of the valve, their color; characterize the condition of the myocardium, the outcome of these plaques on the cusps of the valve.

2. *Recurrent verrucous endocarditis*. The appearance of thickened cusps of the valve (pay attention to the short and thickened tendinous strings). Describe the appearance of the thrombotic masses, the condition of the myocardium.

3. *Fibroplastic endocarditis*. Characterize the cusps of the aortic valve and the mitral valve cusps, their color, transparency, thickness, condition of the cavity of the left ventricle.

4. *Stenosis of the ostium of the mitral orifice*. Describe the cusps of the mitral valve, their thickness, color; the appearance and width of the opening. Due to what process did stenosis develop in the valve? Describe the condition of the myocardium of the left ventricle, its color. The size, type of hypertrophy.

5. *Fibrinous pericardium (Cor villosum)*. The appearance of the heart, changes of the pericardium. What does the heart look like? Name the types of pericarditis in rheumatic disease and their outcome.

6. *Glomerulonephritis in lupus erythematosus*. Describe the appearance of the kidney, condition of the incision.

To study the other microspecimens it is necessary to use the manuals devoted to the subjects: "The mixed degeneration" and "Disturbance of blood circulation".

Microspecimens:

181 – *acute verrucous endocarditis* (stained with hematoxylin and eosin). Pay attention to fibrinoid swelling of the cusps, verrucous plaques on them, focal lymphocytic-histiocytic infiltration on the surface of the valve. Possible outcomes of verrucous plaques on the valve.

183 – *rheumatic productive nodular myocarditis* (stained with hematoxylin and eosin). Name the organ, find Aschoff-Talalayev granuloma. What cells does it consist of? Where does it appear more often? What types of rheumatic nodules-granulomas are distinguished?

26 – *glomerulonephritis in lupus erythematosus* (stained with hematoxylin and eosin). Pay attention to the thickening of capillary membrane in the glomeruli with "wire loop" formation. Find hematoxylin bodies. Name the outcomes.

27 – *periarterial sclerosis in the spleen* (stained with hematoxylin and eosin). Pay attention to the growth of connective tissue surrounding the artery, which looks like onion skin.

Electronograms:

Immune complexes in the skin in systemic lupus erythematosus. Pay attention to focal thickening of basal membranes of the arterioles, accumulation of immune complexes.

Glomerulonephritis in lupus erythematosus – accumulation of immune complexes under the endothelium of the glomerular capillaries, podocytes and in mesangium.

Control final knowledge:

Krok problem test

1. A 45-year-old female, who complained of progressing muscular weakness, underwent a biopsy of soft tissues on her shin. A histological examination of the biopsy revealed some microfocal petrification of the derma and skeletal muscles, a reduced amount of glycogen and transversal striation in the muscular fibers, some fibers were necrotized, the stroma was infiltrated by lymphocytes, macrophages and plasma cells. Make a diagnosis of the disease.

- A. *Dermatomyositis**
- B. *Systemic scleroderma*
- C. *Systemic lupus erythematosus*
- D. *Rheumatism*
- E. *Polyarteritis nodosa*

2. A 54-year-old female suffers from an expressed deformity of joints of her fingers and toes. Histologically, the periarticular connective tissue reveals some mucoid swelling, foci of fibrinoid necrosis, clusters of macrophages and areas of sclerosis, the synovial membrane has an oedema of villi, as well as their mucoid and fibrinoid swelling, the synovial cavity contains “rice bodies”. Make a diagnosis of the disease.

- A. *Rheumatoid arthritis**
- B. *Rheumatism*
- C. *Bekhterev's disease*
- D. *Infectious polyarthritis*
- E. *Gout*

3. The 7-year-old child died from progressing rheumatism with the expressed allergic reactions. In autopsy edemic mitral valve, hystologically is fibrinous swelling. Hyperemia of myocardium, diffuse infiltration by lymphocytes takes place. Pericardium is thickened, grayish color. The described changes in heart it is possible estimate as:

- A. *Pancarditis*.*
- B. *Endocarditis*.
- C. *Myocarditis*.
- D. *Pericarditis*.
- E. *Cardiosclerosis*.

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Diseases of the Respiratory System

Validation of the subject: the knowledge of respiratory system pathology is necessary to make the diagnosis of acute pneumonias and chronic nonspecific diseases of the lungs in the practical work of the doctor. It is necessary to emphasize that in childhood and elderly age focal pneumonias are independent diseases.

Objectives of the lesson: to discuss the etiology, pathogenesis and morphological changes in respiratory organs in acute inflammatory processes, chronic diseases and lung cancer, as well as in their complications.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- croupous pneumonia – stages of development, complications
- the forms of bronchopneumonia
- clinico-anatomical aspect of pneumonias in children
- clinico-anatomical forms of chronic pneumonias
- clinico-anatomical classification of lung cancer

Macrospecimens:

- croupous pneumonia at the stage of grey hepatization
- bronchopneumonia (hypostatic, peribronchial)
- chronic bronchitis with bronchiectasias and pneumosclerosis
- bronchogenic cancer
- cor pulmonale

Microspecimens:

90 – croupous pneumonia at the stage of grey hepatization (stained with hematoxylin and eosin; according to Shieninov for fibrin)

89 – focal pneumonia (stained with hematoxylin and eosin)

22 – emphysema of the lung (stained with hematoxylin and eosin)

202 – carnification of the lung (stained according to van-Gieson)

Slides:

- croupous pneumonia at the stage of grey hepatization
- focal bronchopneumonia
- carnification of the lung
- emphysema of the lung

Electronic micrographs

- pneumonia
- stage of inflow
- obstructive emphysema of the lung

Questions to control basic knowledge

1. What synonyms of a croupous pneumonia do you know? a) lobar, b) focal, c) fibrinous, d) pleuropneumonia, e) bronchopneumonia, f) purulent.
2. What etiological causes of bronchopneumonia are most frequent? a) pneumococcus, b) Friedlander's diplobacillus, c) staphylococcus, d) streptococcus, e) E. coli, f) viruses, g) pathogenic fungi.
3. Which diseases belong to the group of chronic nonspecific diseases of the lungs? a) focal pneumonia, b) chronic bronchitis, c) bronchiectasias, d) croupous pneumonia, e) lung cancer, f) emphysema of the lung, g) pneumofibrosis and pneumocirrhosis, h) chronic abscess, i) gangrene of the lung.
4. Which acute destructive processes in the lungs do you know? a) pneumonia, b) abscess, c) gangrene.

Answers: 1 – a, c, d. 2 – a, c, d, e, f, g. 3 – b, c, f, g, h. 4 – b, c.

Stages of individual work in class:

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. What common diseases of the respiratory system do you know?
2. Croupous pneumonia: etiology and pathogenesis, stages of development; complications (pulmonary, non-pulmonary, atypical forms).
3. Name acute destructive processes in the lungs. What is abscess, gangrene of the lung?
4. What pathological processes are called chronic nonspecific lung diseases?
5. What changes develop in the lungs in bronchiectasias?
6. Concept of "bronchoectatic disease". What are its complications?
7. Are pneumosclerosis and pneumocirrhosis independent diseases or unfavorable outcome of other diseases of the lungs?
8. Concept of emphysema of the lungs. What are the forms of emphysema?
9. Precancerous conditions of the lungs?
10. Name clinico-anatomical classification of lung cancer: a) according to the localization, b) according to the character of growth, c) according to the microscopic picture, d) according to the character of complications.

Macrospecimens:

1. Croupous pneumonia at the stage of grey hepatization. Describe the lung: a) consistence, b) air content, c) appearance on incision, d) prevalence of process, changes of the pleura. Name synonyms, list stages of the disease course, complications.

2. *Bronchopneumonia*. Describe the appearance of the lung: localization of the centers, their sizes, consistence. Name the causative factors. The forms of bronchopneumonia related to the age. List complications. What are the differences between croupous pneumonia and focal pneumonia?

3. *Chronic bronchitis with bronchiectasias and pneumosclerosis*. Describe the kind of a bronchiectasias wall, the color, tissue of the lung on incision, consistence. Give the definition of bronchiectasias. Name the kinds of bronchiectasias according to the etiology. List their complications.

4. *Bronchogenic cancer*. Describe the character of the tumor growth, its color, density. Name its macroscopic form. What are the causes of death in the patients with lung cancer?

5. *Cor pulmonale*. Describe the sizes of the heart, the thickness of the wall of the right and left ventricles, the condition of trabecular and papillary muscles. The causes of development of cor pulmonale.

Electrified stand:

- croupous pneumonia at the stage of grey hepatization
- focal bronchopneumonia
- emphysema of the lungs.

Microspecimens:

90 – *croupous pneumonia at the stage of grey hepatization* (stained with hematoxylin and eosin). Describe the character of exudate, blood filling of the vessels of interalveolar septa. What are the etiological factors, stages of the process, pulmonary and non- pulmonary complications?

89 – *focal pneumonia* (stained with hematoxylin and eosin). Describe the condition of bronchi, the character of exudate blood filling of the interalveolar septa. What are the etiological factors of the disease and its complications?

Electronograms:

- obstructive emphysema of the lungs, intracapillary sclerosis
- obstructive emphysema of the lungs, pneumosclerosis.

Control final knowledge:

Krok problem test

1. An autopsy of a male, who suffered from right-sided pneumonia, revealed in the right lung some cavity, 3.5 cm in diameter, that had uneven edges, communicated with the bronchus and was filled with some purulent exudate. Microscopically, the wall of the cavity was formed by the granulation tissue diffusely infiltrated by leukocytes. Which of the diagnoses, listed below, was the most probable?

A. *Acute pneumogenic abscess*

- B. Acute bronchiogenic abscess**
- C. Chronic bronchiogenic abscess*
- D. Chronic pneumogenic abscess*
- E. Pulmonary echinococcosis*

2. A 50 year-old patient has died because of pulmonary-cardiac insufficiency. In autopsy the pathologist has found out: the upper lobe of the right lung has been red and dense as a liver, white fibrin has been found out on pleura. Microscopic investigation: exudate consists of fibrin, a lot of erythrocytes and a few leukocytes. Call the disease and its stage.

- A. Red hepatization, croupous pneumonia**
- B. Grey hepatization, croupous pneumonia*
- C. Interstitial pneumonia initial stage*
- D. Gangrene, initial stage*
- E. Bronchoectatic disease, last stage*

3. The autopsy has revealed destructive bronchiectasis accompanied by chronic abscesses in the lungs. The kidneys are dense with sebaceous surface on incision. Besides «cor villosum», fibrinous coloenteritis, fibrinous pneumonia are found. Name the basic disease, its complications, and causes of death.

- A. Bronchoectatic disease, secondary amyloidosis, uremia**
- B. Croupous pneumonia, empyema of pleura, intoxication*
- C. Pneumococcal pneumonia, abscess of the lung, sepsis*
- D. Hypertensive disease, primary shrinkage kidney, chronic renal insufficiency*
- E. Transmural myocardial infarction, fibrinous pericarditis, acute cardiac insufficiency*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Diseases of the Gastrointestinal Tract

Validation of the subject: the knowledge of morphological changes in the gastrointestinal tract is necessary for mastering clinical sections of the pathology of digestive organs; it is necessary for correct clinico-anatomical interpretation of the results of morphological study of biopsies, surgical material and results of sectional observations.

Objectives of the lesson: to discuss the etiology, pathogenesis, classification, morphological changes in the basic forms, complications of acute and chronic gastritis, peptic ulcer of the stomach and duodenum, appendicitis and basic diseases of the intestine.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- classifications of acute and chronic gastritis
- complications of ulcerous disease
- acute and chronic appendicitis

Coloured table:

- diagram - chronic ulcer of the stomach

Slides:

- hemorrhagic erosion of the stomach
- acute ulcer of the stomach
- chronic ulcer of the stomach at the stage of exacerbation
- acute phlegmonous appendicitis

Electronic micrographs:

- chronic atrophic gastritis

Macrospecimens:

- chronic atrophic gastritis
- polypous gastritis
- phlegmon of the stomach
- erosive gastritis
- chronic ulcer of the stomach
- chronic ulcer of the stomach with penetration of the pancreas

- phlegmonous appendicitis
- chronic ulcer of the stomach with arrosion of the vessel

Microspecimens:

207 – chronic ulcer of the stomach

208 – acute phlegmonous-ulcerous appendicitis

Questions to control basic knowledge

1. Can tonsillitis promote development of the rheumatic disease?
2. List the forms of acute gastritis depending on morphological changes in the mucosa of the stomach: a) catarrhal, b) atrophic, c) hypertrophic, d) fibrinous, e) purulent (phlegmonous), f) corrosive.
3. Choose three basic stages (forms) of the morphogenesis of ulcerous disease: a) erosion, b) penetration, c) acute ulcer, d) perforation, e) chronic ulcer, f) malignancy.
4. Name the forms of acute exudative peritonitis: a) serous, b) polypous, c) fibrinous, d) purulent, e) granulomatous.
5. Divide the forms of acute appendicitis on destructive (I) and undestructive (II): a) common, b) purulent (phlegmonous), c) superficial, d) apostematous, e) phlegmonous ulcerative, f) gangrenous.

Answers: 1 – yes. 2 – a, d, e, f. 3 – a, c, e. 4 – a, c, d. 5 – I) b, d, e, f; II) a, c.

Stages of individual work in class:

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Etiology, pathogenesis, morphological characteristic and outcome of acute and chronic gastritis.
2. Etiology, pathogenesis, morphological changes, complications and outcomes of appendicitis, ulcerous disease of the stomach and duodenum.
3. Etiology and pathogenesis of basic diseases of the intestine.

Macrospecimens:

1. *Chronic atrophic gastritis.* Characterize the condition of the stomach mucosa (rugae, thickness). Are the specified changes of the mucosa combined with disturbances of secretion? Specify possible histological changes in the mucosa.

2. *Chronic ulcer of the stomach.* Specify localization, sizes and form of ulcerative defect, characterize the depth of the ulcer, its bed and edges. Describe what edge is inverted to the esophagus, and what edge to pylorus. Name possible ulcerous-destructive complications of chronic ulcer of the stomach.

3. *Chronic ulcer of the stomach penetrating the pancreas.* Define localization, sizes and depth of ulcerative defect, the appearance of the bed of the ulcer and underplaying organ. Explain what penetration is and why there is no defect in the stomach?

4. *Chronic ulcer of the stomach with arrosion of the vessel.* Give the macroscopic description of ulcerative defect, specify its localization, form, depth. Describe the edges of the ulcer, its bed and condition of the vessel. Explain the mechanism of the bleeding. What are clinical symptoms of gastric bleeding?

5. *Acute phlegmonous appendicitis.* Describe the changes of the appendix: its diameter, condition of serous coat and vessels, contents of the lumen and thickness of the wall. Name possible complications of the described form of appendicitis.

6. *Empyema of the appendix.* Appearance of the process, the sizes of the lumen (cavity and thickness of the wall). What exudate is present in the lumen? To what form of appendicitis does this case belong according to the course of the disease?

Microspecimens:

207 – *chronic ulcer of the stomach* (stained with hematoxylin and eosin). Describe the shape of ulcerative defect and the condition of its edges, define the depth of the defect in relation to the layers of the stomach wall. List consequently the layers of the ulcer bed, describe the condition of the vessels and nerves of the bed of the ulcer. Do the changes in the ulcer correspond to the stage of exacerbation of the disease? Name possible complications connected with the destruction in the ulcer.

208 – *acute phlegmonous ulcerative appendicitis* (stained with hematoxylin and eosin). Describe the thickness of the wall, the exudate and its character. Is there diffusion of the exudate to the wall of the process and to the peritoneum, covering the process and its mesentery? Specify possible complications of the disease.

Control final knowledge:

Krok problem test

1. A room for dissections received surgically removed tonsils; they were pink-grey, dense in consistency and had superficial erosions. A microscopic examination revealed sclerosis of the capsule and tissues of the tonsils, foci of ulceration in the epithelium. The lymphoid tissue of the tonsils was characterized by hyperplasia and large reactive centers in the follicles. Which of the diagnoses listed below was the most probable?

A. *Catarrhal tonsillitis*

B. *Phlegmonous tonsillitis*

C. *Purulent tonsillitis*

D. *Chronic tonsillitis**

E. *Ulceronecrotic tonsillitis*

2. On fibrogastroscopy, some defect was found in the gastric mucosa; it was 3 cm in diameter, had a dense bottom and edges. A microscopic examination revealed a gastric ulcer, whose bottom was covered with some fibrinous-

purulent exudate, under which there were successive layers of fibrinoid necrosis, granulation and rough-fibrous connective tissues. The connective tissue had scleroid vessels and hypertrophied nerves. Which of the diagnoses listed below was the most probable?

- A. *Acute gastric ulcer*
- B. *Acute ulcer with penetration*
- C. *Perforating ulcer*
- D. *Chronic ulcer at the stage of exacerbation**
- E. *Chronic ulcer at the stage of remission*

3. The removed appendix measures: 9 cm long, 0,9 cm wide. Serosa is dull, hyperemic. Microscopy has revealed swollen walls, stases in the capillaries and venules, small hemorrhages. In the mucous and submucous membranes, there are foci of necrosis with leukocytic infiltration around it. What diagnosis is most probable?

- A. *Acute phlegmonous ulcerative appendicitis**
- B. *Acute phlegmonous appendicitis*
- C. *Acute simple appendicitis*
- D. *Acute gangrenous appendicitis*
- E. *Acute apostematous appendicitis*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Diseases of the Liver, Gallbladder and Pancreas

Validation of the subject: the knowledge of the material is necessary to study surgical and internal diseases of the liver to form clinicoanatomical thinking of the future doctor, as well as to be able to make differential diagnosis of diseases and clinicoanatomical analysis. It is necessary to pay attention to the opportunity of liver cirrhosis development as an outcome of Botkin's disease and hepatocholecystitis, biliary cirrhosis in atresia of the bile ducts.

Objectives of the lesson: on the basis of the modern classifications of liver, pancreas and gallbladder diseases, to discuss the etiology, pathogenesis, morphogenesis of the diseases at different stages of their development; structural basis of convalescence, complications, outcomes and long-term consequences of the above diseases.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- Mexican classification of cirrhosis of the liver
- kinds of liver diseases: hepatitis and hepatosis
- clinico-morphological forms and pathogenesis of viral hepatitis
- acute pancreatitis
- classification of pancreatitis according to V.G. Boyko

Macrospecimens:

- toxic degeneration of the liver
- portal cirrhosis of the liver with splenomegaly
- cardiac (nutmeg) cirrhosis of the liver
- biliary cirrhosis of the liver in the adult
- biliary cirrhosis of the liver in atresia of the bile ducts in children
- large-node cirrhosis of the liver
- pigment cirrhosis of the pancreas in hemochromatosis
- varicose phlebectasia of the esophagus
- primary cancer of the liver against the background of cirrhosis (multiple-node form)
- metastatic cancer of the liver
- chronic calculous cholecystitis
- edema of the gallbladder
- hemorrhagic pancreatitis

Slides:

- small-node cirrhosis of the liver
- toxic degeneration of the liver
- biliary cirrhosis of the liver

Microspecimens:

- # 213 – toxic degeneration of the liver
- # 212 – biliary cirrhosis of the liver
- # 96 – small-node cirrhosis of the liver

Electronic micrographs:

- Acute alcoholic hepatitis (Mallory's corpuscles).

Questions to control basic knowledge

1. Can postnecrotic cirrhosis of the liver develop in general vein congestion?
2. Name the complications of acute cholecystitis: a) obliteration of hepatic duct, b) empyema of the gallbladder, c) phlebosclerosis of the portal system, d) purulent cholangitis, e) pericholecystitis.
3. Name microscopic features of acute alcoholic hepatitis: a) necrosis of hepatocytes, b) occurrence of regeneration adenomas, c) infiltration of portal system by neutrophils of, d) presence of Mallory's corpuscles in cytoplasm of hepatocytes, e) presence of Kauysilmen's corpuscles
4. Name macroscopic forms of hepatic cancer: a) nodal, b) fungoid, c) multiple-node, d) diffuse, e) ulcerated.
5. Name the processes prevailing in the pancreas in chronic pancreatitis: a) sclerotic, b) atrophic, c) inflammatory, d) formation of regeneration adenomas, e) destructive.
6. Name the morphological features: 1) small-node cirrhosis of the liver 2) large-node cirrhosis of the liver: a) granular surface of the liver, b) rapprochement of portal triads and central veins, c) coarse surface of the liver, d) annular development of the connective tissue with fine false lobules.

Answers: 1 – No. 2 – b, d, e. 3 – a, c, d. 4 – a, c, d. 5 – a, b, d. 6 – 1a, 1d, 2b, 2c.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Hepatosis: definition, classification, etiology, pathogenesis, morphological characteristic, complications, outcomes.
2. Viral and alcoholic hepatitis: definition, classification, etiology, pathogenesis, morphological characteristics of complications, outcomes.
3. Cirrhosis of the liver: definition, Mexican classification, etiology, pathogenesis, morphological characteristics, complications, outcomes.
4. Cancer of the liver: precancerous processes in the liver, macro- and microscopic forms of cancer, ways of metastatic spreading, complication.

5. Cholecystitis: definition, classification, morphological manifestation of the inflammation, complications and outcomes.
6. Stones of the gallbladder, cholelithiasis: their complications and outcomes.
7. Cancers of the gallbladder.
8. Acute and chronic pancreatitis: etiology, pathogenesis, morphological features, complications and outcomes.
9. Cancer of the pancreas: macro- and microscopic forms of cancer, ways of metastatic spreading, causes of death.

Macrospecimens:

1. *Toxic degeneration of the liver* Pay attention to the size of the organ, condition of the capsule and consistence of the liver, appearance of the surface on incision. Name the stage of toxic degeneration, causes of its occurrence and outcomes.

2. *Small-node cirrhosis of the liver with splenomegaly*. Describe the appearance of the liver and spleen, size of the organs, condition of the capsule and the surface on incision, consistence. Name the causes of development of the small-node cirrhosis. Characterize the condition of the portal circulation in cirrhosis of the liver.

3. *Cardiac “nutmeg” cirrhosis of the liver*. Describe the condition of the surface of the liver, its consistence, appearance of the organ on incision. Name the diseases, when the cardiac cirrhosis of the liver can be developed.

4. *Biliary cirrhosis of the liver in atresia of the bile ducts in children*.

Define the sizes of the liver, consistence, appearance of the capsule on incision. Which kind of biliary cirrhosis is it? Name the causes of development of biliary cirrhosis.

5. *Biliary cirrhosis of the liver in the adult*. Pay attention to the sizes of the liver, its consistence, the character of the surface and the appearance on incision. Name the features of decompensated cirrhosis of the liver, its complications and outcomes.

6. *Large-node cirrhosis of the liver*. Describe the sizes and appearance of the liver, condition of the capsule, the size of the nodes. Name the causes of development of large-node cirrhosis, its complications and outcomes.

7. *Pigment cirrhosis of the liver and pancreas in hemochromatosis*. Pay attention to the appearance of the organs, their color, consistence, condition of the surface on incision. Name pigments, collecting in the organs in hemochromatosis. Specify the cause of development of this kind of cirrhosis. What is the color of the skin in hemochromatosis? What are the results of the changes in the pancreas in this disease?

8. *Varicose phlebectasia of the esophagus*. Describe the condition of the veins of the esophagus. In what part of the esophagus does this pathological process develop? Explain the mechanism of its development. What disease does this pathology develop in? Name its complications.

9. *Chronic calculous cholecystitis*. Define the size of the gallbladder, the condition of its wall and contents. Specify the factors that promote formation of the stones. Name the kinds of the stones of the gallbladder according to their chemical structure. Name possible complications.

10. *Hemorrhagic pancreatitis*. What is the appearance of the pancreas: its size, color, consistence? Define “acute pancreatitis”. Name its complications and outcomes, classification of pancreatitis.

The slides on the electrified stand:

- small-node cirrhosis of the liver
- biliary cirrhosis of the liver
- toxic degeneration of the liver.

Microspecimens:

212 – *biliary cirrhosis of the liver* (stained with hematoxylin and eosin). At low magnification of the microscope it is necessary to find out overdevelopment of the connective tissue around the extended overflow bile ducts and capillaries; lymphoid-histiocytic infiltrates in portal ducts and in the interlobular stroma.

213 – *toxic degeneration of the liver – stage of yellow degeneration* (stained with hematoxylin and eosin). At low magnification of the microscope define the condition of hepatocytes in the center and on the periphery of the lobules paying attention to the wide-spread necrosis of the hepatic cells in the center of the lobules; at high magnification – on fatty degeneration of the preserved hepatocytes on the periphery of the lobules.

96 – *Small-node cirrhosis of the liver* (stained according to van-Gieson) Demonstration preparation (see: “Productive inflammation”).

Control final knowledge:

Krok problem test

1. A histological examination of a male patient, who abused alcohol and died from ethanol poisoning, revealed in his pancreas an atrophy of the parenchyma, dilation of ducts which resembled cysts in some places, formation of regenerative adenomata, sclerosis, a focal petrification and lymphohistiocytic stromal infiltrations. Which of the diagnoses listed below was the most probable?

- A. *Fatty pancreatonecrosis*
- B. *Haemorrhagic pancreatitis*
- C. *Acute purulent pancreatitis*
- D. *Chronic pancreatitis**
- E. *Pancreatic carcinoma*

2. A microscopic examination of a biopsy from the liver of a patient with a clinical picture of hepatic insufficiency revealed vegetations of the connective tissue in the central parts of the hepatic lobules, bringing of the central veins together with the portal triads (3-4 triads in one visual field of a microscope), a dystrophy, necrosis and regeneration of hepatocytes with a change in the structure of the liver. Which of the diagnoses listed below was the most probable?

A. *Postnecrotic hepatic cirrhosis**

B. *Laennec's cirrhosis*

C. *Hanot's cirrhosis*

D. *Secondary biliary cirrhosis*

E. *Pigmentary cirrhosis*

3. An autopsy of a 48-year-old female, who died from intoxication, revealed icteric coloring of the skin and sclerae, the liver was characterized by a sharply reduced size, flaccid consistency and a contracted capsule. On section, the hepatic tissue was red and plethoric. Microscopically, the hepatocytes were necrotized in the centers of the lobules and in the state of fatty degeneration on the periphery; the reticular stroma of the organ was exposed, the sinusoids were dilated and sharply plethoric. Which of the diagnoses listed below was the most probable?

A. *Steatosis*

B. *Acute productive hepatitis*

C. *Chronic active hepatitis*

D. *Toxic dystrophy of liver at the stage of yellow dystrophy*

E. *Toxic dystrophy of liver at the stage of red dystrophy**

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Diseases of the Endocrine Glands

Validation of the subject: the knowledge of morphological changes in the endocrine glands is necessary for studying diseases as well as in practical work of the doctor for the clinicoanatomical analysis of sectional material

Objectives of the lesson: to discuss the etiology, pathogenesis, morphological changes in the glands in diabetes mellitus, goiter, Addison's disease and Itsenko-Cushing disease; to study their clinicoanatomical manifestations, complications, causes of death.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- diabetes mellitus
- pathogenesis and stages of diabetes mellitus
- prediabetic condition in children
- goiter
- Addison's disease

Slides:

- colloid goiter
- intercapillar (diabetic) glomerulosclerosis
- atrophy of the pancreas

Electronic micrographs:

- ultrastructure of the human thyroid gland
- skin in Addison's disease

Macrospecimens:

- atrophy of the pancreas
- gangrene of the foot
- skeleton in acromegaly
- goiter
- various kinds of pararenal adenoma

Microspecimens:

- # 40 – colloid goiter
- # 214 – atrophy of the pancreas in diabetes mellitus
- # 191 – intercapillary (diabetic) glomerulosclerosis.

Questions to control basic knowledge

1. Does diabetes mellitus develop at reduction of the function of beta cells of the pancreas?
2. Which of the listed pathological processes can result in development of cachexia: a) basedowian goiter, b) necrosis of the anterior part of the pituitary body, c) caseous necrosis of the medullar layer of the adrenal glands, d) basophil adenoma of the pituitary body?
3. Name the basic features, characteristic for diabetes mellitus: a) gigantism, b) hyperglycemia, c) bronze color of the skin, d) glucosuria, e) polydipsia, f) polyuria, g) obesity, h) macromicroangiopathy, i) lypomatosis of the lymphohistiocyte system.
4. Which of the listed syndromes can develop in affection of: 1) anterior part of the pituitary body, 2) posterior parts of the pituitary body: a) acromegaly, b) Itsenko-Cushing disease, c) diabetes insipidus, d) hypophyseal nanism, e) hypophyseal cachexia.

Answers: 1 – Yes. 2 – a, b, c. 3 – b, d, e, f, g, h, i. 4 – 1) a, b, d, e; 2) c.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Classification of the internal secretion glands diseases.
2. Etiology, pathogenesis, complications of diabetes mellitus, causes of death.
3. Morphological characteristic of diabetes mellitus.
4. Etiology, pathogenesis, classification, complications of goiter, causes of death.
5. Mechanism of melanosis development in Addison's disease.

Macrospecimens:

1. *Atrophy of the pancreas in diabetes mellitus.* Note the change of the size, consistence, color of the pancreas, appearance of the organ on incision. Define the changes which develop in the organism in diabetes mellitus.

2. *Gangrene of the foot.* Pay attention to the color of the skin, presence of the border between necrosis and healthy tissue. Name pathological process being the causes of gangrene.

3. *Skeleton in acromegaly.* Describe the body height, proportionality of the development of all body parts. Specify the causes of the disease, complications and causes of death.

4. *Colloid goiter.* Pay attention to the change in the size and surface of the gland, its consistence, kind of the tissue on incision. Functional activity of the thyroid gland in goiter; the basic causes of death in basedowian disease.

5. *Adenoma of the adrenal gland.* Characterize the size of the adrenal gland, the kind of the tumor, its color, presence of the capsule. Name hormone-active adenomas of the cortical layer of the adrenal glands.

6. *Bone in parathyroid osteodystrophy*. Describe the character of the bone, its color on incision, condition of the spongiosa. Specify the cause of the disease, changes of calcium content in the blood, kidneys; the causes of death.

Microspecimens:

40 – *colloid goiter* (stained with hematoxylin and eosin). At low magnification find follicles, note their shape, size, color of the colloid. At high magnification pay attention to the condition of the epithelium.

214 – *atrophy of the pancreas in diabetes mellitus* (stained with hematoxylin and eosin). At low magnification find Langerhans's islands, define their quantity, sizes, character of the pathological process. Pay attention to the condition of the stroma of the gland. At high magnification describe the condition of the beta cells.

191 – *diabetic glomerulosclerosis* (stained with hematoxylin and eosin). At low and high magnifications find glomeruli of the kidney paying attention to the focal clumps in mesangium of eosinophilic hyaline masses and diffuse thickening of basal membranes of glomerular capillaries. Name the cause of death in this disease.

Control final knowledge:

Krok problem test

1. In a young male, an abundant quantity of the somatotrophic hormone and enlargement of the nose, lips, ears, lower jaw, hands and feet were revealed. What is your diagnosis?

- A. *Pituitary dwarfism*
- B. *Cushing's disease*
- C. *Addison's disease*
- D. *Adiposogenital dystrophy*
- E. *Acromegaly**

2. A histological examination of a thyroid gland revealed follicles of various size and shape which were lined with the columnar epithelium; the latter proliferated and formed papillae of various size. The follicular lumens contained some liquid and vacuolized colloid. The stroma of the gland was characterized by a lymphoplasmacytic infiltration, in some places with formation of lymphatic follicles having light centers. Which of the diagnoses was the most probable?

- A. *Colloid goiter*
- B. *Nodular goiter*
- C. *Hashimoto's disease*
- D. *Ligneous thyroiditis*
- E. *Toxic goiter**

3. An autopsy of a 48-year-old male, who died from vascular collapse, revealed an increased pigmentation of the skin, the adrenal glands were reduced in size, the brown-yellow liver was enlarged. On histological examination, foci of necrosis with a tuberculous granulation tissue were found in the adrenal glands. The liver was characterized by phenomena of fatty degeneration. Which of the diagnoses was the most probable?

*A. Addison's disease**

B. Steatosis

C. Primary aldosteronism

D. Cushing's syndrome

E. Lipofuscinosis

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Kidney diseases

Validation of the subject: the knowledge of morphological changes in the kidneys in different diseases is necessary for doctors of different specialities for formation of clinical anatomical mentality which is important for making diagnosis and effective treatment.

Objective of the lesson: Basing on the modern classifications of kidney diseases, to discuss the etiology, pathogenesis, morphological manifestations, complications and outcomes of tubulo- and glomerulopathies, pyelonephritis, kidney amyloidosis, nephrosis, nephrolithiasis and nephrosclerosis.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- Classification of kidney diseases, tubulopathies
- Kidney amyloidosis
- Liponephrosis
- Necrotic nephrosis
- Nephrosclerosis
- Kidney tumours

Coloured tables:

- Glomerulonephritis
- Specific microscopic staining for amyloid

Macrospecimens:

- Malignant glomerulonephritis
- Acute glomerulonephritis
- Ascending pyelonephritis
- Kidney amyloidosis
- Secondary nephrosclerosis
- Nephrohydrosis
- Kidney stones
- Polycystic kidney

Slides:

- Intracapillary glomerulonephritis
- Malignant intra- and extracapillary glomerulonephritis
- Kidneys amyloidosis
- Nephrosclerosis
- Necrotic nephrosis

Microspecimens:

- # 193 – membranous glomerulonephritis
- # 194 – malignant intra- and extracapillary glomerulonephritis
- # 197 – acute extracapillary serous glomerulonephritis
- # 37 – kidneys amyloidosis
- # 73 – necrotic nephrosis

Electronograms:

- Membranoproliferative glomerulonephritis
- Glomerulitis with minimal changes

Questions to control basic knowledge:

- 1) Is granular kidney possible in pyelonephritis?
- 2) Which of the diseases cause development of large mottled kidney?
a) purulent nephritis, b) necrotic nephritis, c) malignant glomerulonephritis, d) kidney amyloidosis, e) acute glomerulonephritis.
- 3) List the morphological changes typical for membranous glomerulonephritis:
a) diffuse thickening of capillary membranes of the glomeruli, b) reduced size of the kidneys, c) moderate proliferation of mesangiocytes, d) granular surface of the kidneys.
- 4) Which complications develop in pyelonephritis? a) pyelophlebitis abscesses, b) kidney carbuncle, c) paranephritis, d) peritonitis, e) hypertension.
- 5) List the changes in the respiratory system in chronic renal insufficiency:
a) fibrinous hemorrhagic tracheitis, b) fibrinous tracheitis, d) pulmonary edema, e) hemorrhagic pulmonary infarctions.
- 6) Which of the symptoms refer to: 1) renal, 2) extrarenal: a) oliguria, b) azotemia, c) proteinuria, d) hypertension, e) edema, f) hematuria.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Classification of kidney diseases.
2. Definition, etiology and pathogenesis of glomerulonephritis; renal and extrarenal symptoms of glomerulonephritis; classification according to the topography of the process, the character of tissue reactions and the type of exudation; macro- and microscope peculiarities of acute, malignant and chronic glomerulonephritis.
3. Nephrosis; definition, classification, etiology, pathogenesis, pathological anatomy and the outcome.
4. Kidney amyloidosis: definition, etiology, pathogenesis, pathological anatomy of its stages, complications, the cause of death.
5. Chronic and acute tubulopathies: definition, etiology, pathogenesis, pathological anatomy, complications and the cause of death.

6. Nephrolithiasis and pyelonephritis; definition, etiology, pathogenesis, pathological anatomy, complication, the cause of death.
7. Nephrosclerosis: definition, causes, kinds, outcomes.
8. Chronic renal insufficiency: definition, pathological anatomy.
9. Kidney tumours.

Macro specimen:

Malignant glomerulonephritis (“large mottled kidney”). Pay attention to the size (texture, appearance) of the kidney, and correlation and colour of the cortical and medullar substances on incision. How can we explain the appearance of the kidney? Which peculiarities of blood circulation are present in the kidney in glomerulonephritis?

Acute glomerulonephritis. Determine the size and the character of the kidney surface; describe the state of the cortical and medullar substances. List renal and extrarenal signs of glomerulonephritis. Explain the etiology and pathogenesis of the disease.

Ascending pyelonephritis. Describe the appearance of the serous membrane of the ureter and the pelvis of the kidney: size, surface, texture of the kidney. Determine the kind of inflammation, name the etiological factors of pyelonephritis, the ways of infection invasion to the kidney, complications and outcomes of pyelonephritis.

Secondary nephrosclerosis. Describe the appearance and size of the organ, its texture, state of the surface, cortical and medullar substances on incision. List the processes resulting in secondary nephrosclerosis. Name the forms of nephrosclerosis and their outcomes.

Kidney amyloidosis. Pay attention to the size, appearance of the surface, the colour of the parenchyma on incision and the state of the layers. List the diseases in which kidney amyloidosis occurs. Determine the localization of amyloid in the kidney. Explain the etiology, pathogenesis and outcomes of kidney amyloidosis.

Polycystic kidney. Describe the size of the kidneys, their appearance (the surface on incision). Explain the etiology, pathogenesis, outcomes of the disease.

Nephrohydrosis (see “Atrophy”)

Stones in kidney (see “Disturbances in electrolyte metabolism”)

Electronograms:

- Intra- and extracapillary glomerulonephritis
- Kidney amyloidosis
- Necrotic nephrosis
- Nephrosclerosis

Microspecimen:

193 – *Mesangiocapillary glomerulonephritis (stained with hematoxylin and eosin)*. At low magnification, pay attention to diffuse thickening of the capillary membranes of the glomeruli, moderate proliferation of mesangiocytes, enlarging of the vascular lobules with focal hyalinosis and clutching character of the glomeruli, the accumulation of the matrix in the mesangium. In the epithelium of the convoluted tubules, there is granular and ballooning degeneration, in the lumen there are hyalin cylinders.

194 – *Malignant intra- and extracapillary glomerulonephritis (stained with hematoxylin and eosin)*. Pay attention to the enlargement of endotheliocytes and mesangiocytes in separate glomeruli, proliferation of nephrothelium of the glomerular capsules with semilunar formations; presence of empty hyalinized glomeruli; in some glomeruli there is serous, fibrinous, hemorrhagic exudation in the lumen of Bowman's capsules; in the epithelium of convoluted tubules – granular degeneration, in the lumen of the collecting tubes – hyalinized cylinders.

197 – *Acute extracapillary serous glomerulonephritis (stained with hematoxylin and eosin)*. At low magnification, find glomeruli containing eosinophilic serous content in the lumen of Bowman's capsules.

Demonstrative specimen.

37 *Kidney amyloidosis (stained with Congo red)*. At low magnification, determine congophilic structures in the kidney – in the glomeruli, tubules, vessels and stroma (deposition of amyloid in the stroma of the glomeruli, under argiophilic membranes of the blood vessels, under the tunic of glandular cells, along the fibrillar structures in the stroma of the kidney).

Electronogram:

“Membranoproliferative glomerulonephritis” Pay attention to the thickening of the basement glomerular membrane of the capillaries, activation of mesangium cells.

Control final knowledge:

Krok problem test

1. A 42-year-old male, who was ill with a severe form of typhoid fever, developed acute renal failure which caused his death. On autopsy, the kidneys were enlarged, edematous, their fibrous capsule was easily removed; on section, the cortical substance was pale grey, the malpighian pyramids were dark red. A histological examination revealed that the lumens in the most of the tubules were narrowed, the epithelial cells were enlarged and had no nuclei; the glomeruli were collapsed; the stroma was characterized by an edema, some leukocytic infiltration and small haemorrhages. Indicate the renal pathology which caused the patient's death.

- A. Acute pyelonephritis*
- B. Nephrotic syndrome*
- C. Acute glomerulonephritis*
- D. Pyonephrosis*
- E. Necronephrosis**

2. An autopsy of a 62-year-old male patient revealed that his skin was grey-sallow with microfocal haemorrhages, his face was as if covered with some whitish powder, the patient had fibrinous-haemorrhagic laryngitis, tracheitis, fibrinous pericarditis, gastritis, enterocolitis. What syndrome is characterized by this complex of morphological changes?

- A. Chronic renal insufficiency**
- B. Cushing's*
- C. Acute renal failure*
- D. Chronic cardiac insufficiency*
- E. Chronic hepatic insufficiency*

3. A histological examination of a 56-year-old male, who died from chronic renal insufficiency, revealed the following changes: focal sclerosis and a lymphoplasmacytic infiltration of the interstice, mucous membranes of the pelvis and calyces, a metaplasia of the transitional epithelium into the stratified squamous one, numerous encapsulated abscesses. The epithelium of the tubules was in the state of dystrophy and necrosis. The lumens of solitary tubules were dilated and filled with some colloid contents, the epithelium was flattened (the tissue resembled the thyroid gland). The glomeruli were focally scleroid. Name the pathological process.

- A. Acute pyelonephritis*
- B. Chronic tubulointerstitial nephritis*
- C. Necronephrosis*
- D. Chronic pyelonephritis**
- E. Chronic glomerulonephritis*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Diseases of the female and male reproductive system, pregnancy and puerperal period

Validation of the subject: the knowledge about different pathology of reproductive system is necessary for doctors of different specialities for formation of clinical anatomical mentality, which is important for making diagnosis and effective treatment especially in obstetrics, gynecology, urology, endocrinology, pediatrics.

Objective of the lesson: Basing on the modern ideas, to discuss the classification, etiology, pathogenesis, morphological manifestations, complications and outcomes of dyshormonal, inflammatory and neoplastic diseases of female reproductive system and diseases associated with pathology of pregnancy and puerperal period.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- Diseases of pregnancy and puerperal period
- Classification of genital diseases
- Dyshormonal diseases of female and male reproductive system

Coloured tables:

- Fibroadenoma of the breast

Macrospecimens:

- Adenoma of the prostate gland
- False erosion of the cervix
- Hydatidiform mole
- Fetus papyraceus
- Lithopedion
- Postpartum endometritis
- Tubal pregnancy
- Ovarian pregnancy
- Fibromyoma of the uterus
- Fibromyoma of the breast
- Metastasis of chorionepithelioma in the liver
- Breast cancer

Slides:

- False erosion of cervix
- Glandular hyperplasia of the endometrium
- Fibromyoma of the uterus
- Fibromyoma of the breast

Microspecimens:

- # 145 – glandular hyperplasia of the endometrium
- # 226 – false erosion of the cervix
- # 229 – residues of abortion
- # 228 – tubal pregnancy
- # 227 – chorionepithelioma

Electronograms:

- Hydatidiform mole

Questions to control basic knowledge:

1. Is ectopic pregnancy caused by disturbance of contractile activity?
2. Name the diseases of puerperal period: a) tubal pregnancy, b) placental polyp, c) chorionepithelioma, d) hydatidiform mole, e) eclampsia, f) ectropion.
3. Which morphological changes characterise hydatidiform mole? a) hydropic degeneration of the chorion villi, b) adenomatous structure of the villi, c) epithelium proliferation of the chorion villi, d) absence of the vessels in the villi.
4. Name the diseases of pregnancy: a) hydatidiform mole, b) eclampsia, c) labor infection of the uterus, d) ectopic pregnancy, e) chorionepithelioma, f) premature labor, g) placental polyp, h) spontaneous abortion (miscarriage).
5. List the possible types of the ectopic pregnancy: a) tubal pregnancy, b) hydatidiform mole, c) ovarian pregnancy, d) abdominal pregnancy, e) ectropion.
6. Give examples of benign and malignant tumours of the uterus: a) fibromyoma, b) sarcoma, c) squamous cell carcinoma, d) chorionepithelioma, e) leiomyoma, f) polyp h) adenocarcinoma.

Answers: 1 – yes. 2 – b, c, d, f. 3 – a, c, d. 4 – b, d, f, h. 5 – a, c, d. 6 – 1) a, e, f; 2) b, c, h.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Classification of the diseases of the female reproductive system.
2. What are the most common diseases of the male reproductive system?
3. Etiology and pathogenesis of dyshormonal and inflammatory diseases of the uterus.
4. Clinicomorphological characteristic of inflammatory diseases of the reproductive system.
5. The most common types of pregnancy pathology, its causes and outcomes.

6. The concept of spontaneous abortion, labor infection, placental polyp, hydatidiform mole; their outcomes and complications.
7. Etiology, pathogenesis and pathomorphology of eclampsia and its complications.
8. Benign and malignant tumours of the reproductive system.

Macrospecimen:

False erosion of the cervix. Indicate the localization of the erosion. Characterise: a) outlines, b) surface, c) colour. Name the types of false erosion: a) ... , b) What are the complications and outcomes: a) ... , b) ... , c) ... ?

Adenoma of the prostate gland. Describe the appearance of the prostate gland: size, consistence, and colour. Give a synonym for adenoma of the prostate gland. Name its morphological types. Characterise the condition of the urethra, the size of the bladder, the condition of the bladder wall, bladder cavity and trabecular apparatus.

Hydatidiform mole. Describe the appearance of the hydatidiform mole: character of changes, sizes of the “bubbles” and their amount. Name the cause of the hydatidiform mole, types of degeneration, outcomes.

Fetus papyraceus. What is appearance of the macrospecimen: sizes of the fetus, the character of the changes. Name the cause, type of ectopic pregnancy.

Lithopedion. Describe the appearance of the fetus: its size, consistence. What is the cause of this pathology? Name the type of ectopic pregnancy and type of calcification.

Tubal pregnancy. Characterise the size of the tube, condition of the wall, contents of the lumen, localization of the pregnancy. Name the types of the tubal abortion. List the outcomes of tubal pregnancy for the fetus.

Postpartum endometritis. Characterise the size of the uterus, its appearance (the surface on incision). Explain the etiology and pathogenesis. List the types of endometritis according to the labor and the outcomes of the disease.

Cancer of the uterus body. What is the appearance of the organ, size, character of growth in relation to the lumen and surrounding tissue? List the types of the cancer according to the character of growth and form. List possible histological types.

Metastasis of chorionepithelioma in the liver. Describe the appearance of the organ and metastatic nodes. Which pathological process can precede the tumors?

Fibromyoma of the uterus. Characterize the appearance (size, localization of the tumor nodes in relation to the layers of the uterus wall. Describe the boundary of the tumor nodes, their color, density, the surface on incision.

Breast cancer. Characterize the appearance of the organ, name the form of the tumor, histological types of breast cancer, precancerous processes, possible metastases.

Microspecimen:

226 – *false erosion of the cervix (stained with hematoxylin and eosin)*. Characterise the changes of the vaginal part of the cervix. Name the cause of appearance for such pathology. Name the outcomes.

229 – *residues of abortion (stained with hematoxylin and eosin)*. At low magnification, pay attention to the presence of cells of decidual tissue, chorion villi, hemorrhages and fibrinoid necrosis.

228 – *tubal pregnancy (stained with hematoxylin and eosin)*. At low magnification describe the wall of the tube, pay attention to it thickening. The mucosa is preserved in separate foci resembling papilla overgrowth; it is covered with cylindrical epithelium. The tube is thinned and soaked with blood in one of the fragment. There are isolated chorion villi and cells of decidual tissue in the mucosa.

145 – *glandular hyperplasia of the endometrium (stained with hematoxylin and eosin)*. At low magnification pay attention to the thickened endometrium due to the presence of big amount of coiled glands with papilla overgrowth; some of them with dilated lumens.

227 – *chorionepithelioma (stained with hematoxylin and eosin)*. Pay attention to the presence of light epithelial Langerhans cells with the appearance of giant, multiplied and polymorph cells of syncytium among them.

Electronogram:

“Hydatidiform mole”.

Pay attention to the cytoplasm of syncytium cell, which is filled with vacuoles and presence of numerous pinocytotic bubbles in the microvilli.

Control final knowledge:**Krok problem test**

1. Microscopically, a scrape from the uterine cavity, taken in a 36-year-old female against a background of uterine bleeding, revealed a neoplasm which consisted of a large number of light epithelial cells of Langerhans and multinuclear symplasts, the number of figures of mitosis was increased. The stroma was absent, the vascular cavities were lined with the above cells. Make a diagnosis of the uterine tumor.

- A. *Choriocarcinoma**
- B. *Endometrial polyp*
- C. *Endometrial adenocarcinoma*
- D. *Simple hydatidiform mole*
- E. *Invasive hydatidiform mole*

2. A 39-year-old female with a clinical picture of acute abdomen underwent surgical removal of an enlarged uterine tube. On examination, the serous coat of the uterine tube was dark purple, the lumen contained some blood clots. A histological examination of the wall of the tube revealed that the mucous membrane had layers of the decidual cells, and there were villi of the chorion among the blood clots. What is the most probable diagnosis?

A. *Tubal pregnancy**

B. *Placental polyp*

C. *Choriocarcinoma*

D. *Haematosalpinx*

E. *Salpingitis*

3. A 19-year-old woman gave birth to a healthy male infant at term following an uncomplicated pregnancy. She has now been breast feeding the baby for a month, but notes that her left breast has gradually become swollen and painful to touch over the past week. On physical examination her temperature is 38.2 °C. Which of the following is the most likely diagnosis?

A. *Acute mastitis**

B. *Fibrocystic disease*

C. *Fat necrosis*

D. *Intraductal papilloma*

E. *Galactocele*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Prenatal and perinatal pathology

Validation of the subject: the knowledge about embryogenesis and perinatal pathology is necessary for mastering obstetric aspects in clinic, for understanding different types of pediatric pathology, for clinico-anatomical analysis of autopsy material which is especially important for future obstetricians, gynecologists, pediatricians.

Objective of the lesson: to discuss the division into period and regularity of progenesis and kymatogenesis, gametopathies, blastopathies and fetopathies; to study perinatal pathology.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

Annotated tables:

- Kymatogenesis and types of embryopaty
- The causes of kymatopathies
- Classification of embryopathies
- Most common development defects
- Classification of pneumopathies
- Hemorrhagic disease of the newborn

Schemes:

- Scheme of kymatogenesis and types of embryopathy
- Scheme of teratogenic period of separate organs and parts of the body according to Hertler
- Scheme of possible disturbances of development in period of blastogenesis according to Hertler

Macrospecimens:

- Craniopagus
- Thoracopagus
- Ischiopagus
- Anencephaly and acrania
- Cyclopia
- Ventricular septal defect of the heart
- Meckel's diverticulum
- Polycystic kidney
- Horseshoe kidney

- Megaloureter
- Chondrodysplasia
- Cerebral microfocal hemorrhage in asphyxia of the fetus
- Cephalhematoma
- Hyaline membrane disease
- Staphylococcal destruction of the lungs

Slides:

- Generalized edema of the fetus
- Cyclopia
- Causal genesis of congenital defects
- Incomplete osteogenesis
- Hydrocephalus
- Ventricular septal defect of the heart
- Chondrodysplasia
- Basic congenital defects of development in the esophagus and trachea
- Fetus with two heads
- Fetus with doubling of the arms
- Ichthyosis
- Hernia of the vertebral column
- Herniation of the brain (encephalocoele)
- Porencephalia
- Kidney of the immature child
- Congenital primary atelectasis
- Meconium aspiration
- Edematous hemorrhagic pulmonary syndrome
- Nuclear jaundice (kernicterus)
- Diabetic fetopathy
- Deciduitis

Microspecimens:

- # 11 – cerebral microfocal hemorrhage in asphyxia
- # 12 – stasis in cerebral vessels in asphyxia
- # 15 – lungs in hyaline membrane disease

Questions to control basic knowledge:

1. Is atelectasis of the newborn associated with pneumopathies?
2. Which of the disease refer to noninfectious fetopathies: a) congenital syphilis, b) mucoviscidosis, c) toxoplasmosis, d) hemorrhagic disease of the newborn, e) fibroelastosis of the endocardium, f) diabetic retinopathy?
3. Name the signs of Fallot's triad: a) ventricular septal defect of the heart, b) dextroposition of the aorta, c) stenosis of the pulmonary artery, d) hypertrophy of the right ventricle.

4. Which of the types refer to blastopathy (I) and embryopathy (II): a) diplopagus, b) Fallot's triad, c) ischiopagus, d) megaloureter.

Answers: 1 – yes. 2 – b, d, e, f. 3 – a, c, d. 4 – I) a, c; (II) b, d.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Definition of the perinatal period, conception about periodization and regularities of fetal development.
2. Etiology of kymatopathies. Teratogenic terminative periods.
3. Regularities of the kymatopathy pathogenesis.
4. Conception about gametopathies.
5. Etiology, pathogenesis and pathomorphology of the blastopathies.
6. Classification of the embryopathies.
7. Pathology anatomy of the congenital defects of the heart, CNS, alimentary tract, respiratory system, urinary system, muscular system.
8. Etiology, pathogenesis, pathomorphology and prognosis of the infectious and non-infectious fetopathies.
9. Age-specific changes of the placenta. What are developmental defects of the placenta do you know?
10. Main signs of the blood circulation disturbance in the placenta.
11. Name main types of the placentitis. Causes and conditions for their development.
12. Name morphological signs of the fetal immature and overmature.
13. Etiology, pathogenesis and pathomorphology of the newborn asphyxia, pneumopathies and labor trauma.
14. Give definition for hemorrhagic disease of the newborn. Etiology, pathogenesis and pathomorphology of the disease.

Macrospecimen:

Craniopagus. Pay attention to accretion by heads. Give definition for diplopagus. Indicate the period and cause of development for such pathology.

Thoracopagus. Pay attention to accretion in the region of the breastbone. In what period of kymatogenesis does this pathology appear? Give definition for “teratogenic period”.

Diplopagus. Indicate the period and cause of development for such pathology.

Anencephaly and acrania. Pay attention to absence of the brain substance and the bones in the vault of the skull; to prominence of the eyeballs from the orbits, to wide bridge of the nose and low floors of the auricles. What period of kymatogenesis does this monstrosity appear in? Name teratogenic factors.

Cyclopia. Describe the macrospecimen paying especial attention to the face of the fetus, note the presence of one orbit with one eyeball. What period of kymatogenesis does this defect develop? Name the causes of kymatopathies.

Ventricular septal defect of the heart. Describe the macrospecimen paying attention to the ring aperture in the region of the interventricular septum. Characterize the hemodynamics in this defect.

Polycystic kidney. Pay attention to the enlargement of the kidneys, presence of numerous cysts on the surface and in the deep portions of the cortical layer. Describe the cysts: form, size and contents. What organs are injured in polycystosis in addition to the kidney?

Horseshoe kidney. Pay attention to accretion of the kidneys beside one of the poles. Describe their outlook and size. Pay attention to clear boundary between the cortical and medullar layers. What is the clinical manifestation of this defect? Name the cause of its development.

Megaloureter. Pay attention to the sharply dilated ureter. Name the period of kymatogenesis in which this defect develops. What are clinical manifestation and complication of this defect? What is the outcome?

Chondrodysplasia. Describe the macrospecimen. Pay attention to the extreme contraction of the upper and lower extremities, their thickening, enlargement of the fetal head. Pay special attention to the short neck, hypoplasia of the chest and thickening of the tongue. What period of kymatogenesis does this defect develop? What is the prognosis for the life of the child? With what is this defect associated often?

Herniation of the brain (encephalocoele). Describe the macrospecimen. What period of kymatogenesis does this defect develop in?

Meckel's diverticulum. Pay attention to the finger-like protrusion of the ileum. Name the condition for development of this defect.

Cephalhematoma. Pay attention to accumulation of blood between the periosteum and bones of the vault of the skull. Determine the mechanism of hemorrhage. What are the maternal causes of entailed child injury? Name the causes of birth injury, which are determined by fetal status.

Staphylococcal destruction of the lungs. Describe the macrospecimen paying attention to numerous abscesses under the pleura in the lungs of the newborn. Indicate the possible way of infection penetration to the organism of the newborn. What diseases can be the source of fetal contamination?

Hyaline membrane disease. Describe the lung appearance. Pay attention to the changes in the color, firm consistence. Describe the pulmonary tissue on incision. What are the causes of this pneumopathy? Determine the cause of death.

Microspecimen:

11 – *cerebral microfocal hemorrhage in asphyxia (stained with hematoxylin and eosin).* At low magnification determine numerous small hemorrhage localized perivascularly and presence of perivascular and pericellular edema.

12 – *stasis in cerebral vessels in asphyxia (stained with hematoxylin and eosin).* At high magnification pay attention to dilatation of capillary lumen, intracapillary aggregation of the erythrocytes. What are the consequences and significance of stasis?

15 – *lungs in hyaline membrane disease (stained with hematoxylin and eosin)*. At low magnification, determine the alveoli, pay attention to homogeneous eosinophilic masses located in the ring-like manner in the respiratory parts. What is the nature of these masses? Describe the mechanism of development of hyaline membrane disease. What is the outcome of the disease?

Control final knowledge:

Krok problem test

1. During the operation of the 2-year-old girl in the retroperitoneal area it was found out: hypoplasia of right kidney. Call the most probable period of development of this change:

- A. *Embryogenesis**
- B. *Blastogenesis*
- C. *Progenesis*
- D. *Early fetogenesis*
- E. *Late fetogenesis*

2. A 1-year-old child had the following syndrome: flat facial profile, oblique palpebral fissures, epicanthic folds, atrial septum defect, trisomy 21. Described changes are characteristic for:

- A. *Down syndrome**
- B. *Patau's syndrome*
- C. *Klinefelter's syndrome*
- D. *Turner's syndrome*
- E. *Edward's syndrome*

3. Autopsy of the newborn showed jaundice of the skin, signs of the bilirubin encephalopathy in the brain substance, bilirubin infarctions in the kidneys, enlarged liver and spleen. His mother is Rh-negative. The child died on the third day after birth. What is your diagnosis?

- A. *Hemolytic disease of newborn**
- B. *Birth injury*
- C. *Pneumonia in newborn*
- D. *Respiratory distress syndrome of newborn*
- E. *Edematous hemorrhagic syndrome*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson Intestinal Infections

Motivational characteristic of the subject: knowledge of the Infectious Diseases chapter is necessary for mastering corresponding subjects at clinical departments and for clinical anatomical interpretation of autopsy material.

The educational purpose and tasks of the lesson are as follows: discuss of etiology, pathogenesis and anatomical pathology of the stages and forms of typhoid (enteric fever), dysentery, salmonellosis and cholera, as well as their possible complications and outcomes.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

- tables: “Typhoid”, “Dysentery”, “Salmonellosis”, “Cholera”;
- colour pictures: “Cerebriform swelling of Peyer’s patches in typhoid” (macro-micropreparation), “Catarrhal desquamative enteritis in cholera” (microstructure), “Colitis in dysentery” (microstructure), “Lymph node in typhoid” (micropreparation);
- slides: “Cerebriform swelling of Peyer’s patches in typhoid”, “Choleraic enteritis”, “Dysenteric colitis”, “Lymph node in typhoid”;
- macropreparations: cerebriform swelling of Peyer’s patches, stage of necrosis and ulceration of Peyer’s patches, splenic hyperplasia in typhoid, diphtheritic colitis in dysentery, chronic polypoid-ulcerative colitis;
- microspecimens: No. 230 – cerebriform swelling of Peyer’s patches in typhoid, No. 231 – hyperplasia of lymph node in typhoid, No. 232 – diphtheritic-ulcerative colitis in dysentery.

Questions to control basic knowledge

1. Is the causative agent of typhoid discharged with milk of lactating women?
2. Name possible methods of laboratory diagnosis of typhoid within the first two weeks: a) haemoculture, b) Wassermann’s test, c) Widal’s test.
3. List forms of salmonellosis: a) intestinal (toxic), b) dysenteric, c) typhoidal, d) septic.
4. Extraintestinal complications in dysentery: a) perforation of ulcer, b) paraproctitis, c) bronchopneumonia, d) pyelitis, e) arthritides, f) abscesses in liver, g) amyloidosis, h) intoxication, i) exhaustion.
5. Complications of cholera: specific (1) and non-specific (2): a) pneumonia, b) abscesses, c) phlegmon, d) erysipelas, e) sepsis, f) post-choleraic typhoid, g) post-choleraic uremia.

Answers: 1 – yes. 2 – a, c. 3 – a, c, d. 4 – c, d, e, f, g, h, i. 5 – 1) f, g; 2) a, b, c, d, e.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. List stages of changes of Peyer's patches in typhoid: a) ..., b) ..., c) ..., d) ..., e)
2. What forms of salmonellosis are distinguished: a) ..., b) ..., c) ... ?
3. Name the main intestinal complications in dysentery: a) ..., b) ..., c) ..., d) ..., e) ..., f)
4. List the main morphological changes in the small intestine that are revealed in persons who died within the active period of cholera: a) blood filling, b) state of the epithelium, c) state of the serous coats, d) contents of the intestine.
5. Name the main causes of death in cholera: a) ..., b) ..., c) ..., d)
6. Autopsy has revealed fibrinopurulent peritonitis. In the ileum, in the centre of necrotized Peyer's patches there are ulcers with uneven edges. In the bottom of one of them there is perforation. Microscopically, edges of partially necrotized patches reveal proliferation of the reticular cells. What diagnosis should be made on the basis of the above findings? (The disease, the stage of its development, the name of microscopical structures in Peyer's patches).

Answers:

1. a) cerebriiform swelling, b) necrosis of Peyer's patches, c) formation of ulcers, d) stage of clear ulcers, e) healing of ulcers.
2. a) intestinal (toxic), b) septic, c) typhoid.
3. a) perforation, b) paraproctitis, c) peritonitis, d) intestinal phlegmon, e) intestinal haemorrhage, f) cicatricial stenoses of intestine.
4. a) acute plethora, b) necrosis and desquamation of epithelium, c) colourless fluid without any smell ("rice water"), d) dry with haemorrhages, dim, covered with mucus.
5. a) dehydration, b) coma, c) uremia, d) intoxication.
6. Typhoid, stage of formation of ulcers, typhoid granulomas.

Macropreparations:

1. *Cerebriiform swelling of Peyer's patches in typhoid.* Describe Peyer's patches and solitary follicles, point out the size and shape of these formations, their localization in the small intestine, their proportion in the lumen; appearance of the surface and form on section. What is the causative agent of the disease? List possible intestinal complications and specify when (at what stage) they may appear.

2. *Stage of necrosis and ulcerations of Peyer's patches.* Describe the size and integrity of the patches, state of the surface, appearance of the edges of ulceration and characteristics of the bottom in some ulcers. Name the portion of the small intestine where changes of Peyer's patches are the most pronounced. What extraintestinal complications can take place?

3. *Splenic hyperplasia in typhoid*. Describe the size of the organ, its mass and consistency; the cause and pathogenesis of splenic hyperplasia.

4. *Diphtheritic colitis in dysentery*. Describe thickness of the large intestinal wall and state of its mucous coat (surface, color). Point out the primary localization of this process in the large intestine. Disclose the mechanism of formation of ulcers in dysentery and give their macroscopic characteristics (shape, size, depth). Name possible intestinal complications and causes of death.

5. *Chronic polypoid-ulcerative colitis*. Describe appearance of the mucous coat: size, shape and depth of ulcers, appearance of the preserved mucous coat. What kind of inflammation is typical for this pathology? What complications may develop against this background?

Microspecimens:

No. 230 – *cerebriform swelling of Peyer's patch in typhoid (stained with hematoxylin and eosin)*. Describe the degree of blood filling and cell composition in the patch, give a quantitative assessment of the lymphocytes and reticular cells. Describe the reticular cells (size, color of their nuclei, state of cytoplasm). Name the structures which are formed by the reticular cells.

No. 231 – *hyperplasia of lymph node in typhoid (stained with hematoxylin and eosin)*. Point out whether the lymph node structure is intact and describe the cell composition of the typhoid granulomas. What may be revealed in the cytoplasm of the reticular cells? What organs are similar changes possible in?

No. 232 – *diphtheritic-ulcerative colitis in dysentery (stained with hematoxylin and eosin)*. Describe composition of films on the mucous coat of the large intestine; point out how deep they penetrate into the wall (layers) of the intestine. Describe the mucous coat, the degree of its intactness, the depth of ulcerative defects, the state of the vascular system. Name possible outcomes of this pathology and possible intestinal complications.

Control final knowledge:

Krok problem test

1. An autopsy of a 46-year-old male, who died from intoxication, revealed mucus and some blood in the lumens of the rectum and sigmoid colon, the mucous membrane had numerous brown-green membranous superpositions and haemorrhages. Microscopically, fibrinous colitis was found. On bacteriological examination of the intestinal contents, *Shigella sonnei* was isolated. Make a diagnosis of the disease.

A. *Cholera*

B. *Salmonellosis*

C. *Dysentery**

D. *Yersiniosis*

E. *Crohn's disease*

2. On autopsy of a 40-year-old male, who died from intoxication, his small intestine contained groups of follicles which rose above the mucous coat. Their surface had grooves and convolutions, their pattern resembling the cerebral surface. Against a background of loss of lymphocytes, a microscopic examination of the follicles revealed a proliferation of monocytes, histiocytes and reticular cells, as well as clusters of macrophages which formed granulomata. What disease are the described changes typical for?

- A. *Dysentery*
- B. *Salmonellosis*
- C. *Amoebiasis*
- D. *Typhoid fever**
- E. *Cholera*

3. The disease in a 35-year-old male began acutely with diarrhoea and numerous vomitings, his faeces were watery. Against a background of a sharply expressed dehydration, he developed spasms followed by a comatose state, and the patient died. On autopsy, an expressed cadaveric rigidity, a dry wrinkled skin of the hands and blood thickening were found. The lumen of the small intestine was sharply dilated and overfilled with some colorless fluid which resembled rice water. The mucous coats of the stomach and intestine were oedematous, with a lot of microfocal haemorrhages. Microscopically, serous-haemorrhagic gastroenteritis was revealed. What is your diagnosis?

- A. *Salmonellosis*
- B. *Yersiniosis*
- C. *Colibacillosis*
- D. *Cholera**
- E. *Typhoid fever*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Viral infections. Rickettsioses. Malaria

Motivational characteristic of the subject: knowledge of morphological changes in the organism during viral infections is necessary for understanding viral diseases and rickettsioses at clinical departments; in the practical work of a doctor, it is necessary for understanding viral diseases and rickettsioses during clinical anatomical analysis of autopsy observations.

The educational purpose and tasks of the lesson are as follows: discuss of etiology, pathogenesis, classification, morphological peculiarities and pathomorphosis of influenza, parainfluenza, adenoviral respiratory-syncytial infection, smallpox, rabies, classical typhus, malaria.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

- text tables: “Dynamics of local changes in influenza”, “Classical typhus”;
- colour pictures: “Haemorrhagic necrotic laryngotracheo-bronchitis”, “Lung in influenza”, “Patient’s appearance and types of temperature curves in influenza” “Types of vasculites in classical typhus”, “Patient’s appearance in classical typhus”, “Smallpox virus”, “Clinical forms of smallpox”, “Development of eruption elements in smallpox”, “Types of temperature curves in malaria”;
- slides: “Vasculites in classical typhus”, “Typhous granuloma in myocardium”, “Haemorrhagic meningitis”, “Haemorrhagic tracheobronchitis in influenza”;
- macropreparations: haemorrhagic laryngotracheobronchitis in influenza, haemorrhagic pneumonia in influenza, spleen in malaria, changes on skin in smallpox;
- microspecimens: No. 205 – serous-desquamative viral pneumonia; No. 88 – viral-bacterial pneumonia; No. 223 – typhogenic encephalitis.

Questions to control basic knowledge:

1. Are there any abscesses in the lungs during an acute course of toxic influenza?
2. Which of the listed processes are characteristic of the “large motley influenzal lung”: a) foci of pneumonia, b) inter-alveolar haemorrhages, c) anthracosis, d) pneumosclerosis, e) foci of abscess formation and necrosis?
3. List morphological changes in the organism characteristic of classical typhus: a) presence of exanthema, b) meningo-encephalitis, c) parenchymatous encephalitis, d) interstitial encephalitis, e) diffuse waxy (porphyry) spleen.

4. What morphological manifestations are observed in organs during smallpox: a) pulmonary gangrene, b) osteomyelitis, c) intestinal gangrene, d) orchitis, e) necrotic pneumonia?
 5. Name postvaccinal complications in smallpox and rabies: a) meningo-encephalitis, b) allergic eruptions, c) acute ascending paralysis (Landry's paralysis), d) necroses of soft tissues in the area of vaccination, e) paralysis of single nerves and mental disorders.
- Answers:* 1 – no. 2 – a, b, e. 3 – a, b. 4 – b, c, d, e. 5 – smallpox (a, b, d), rabies (a, c, e).

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. List clinical-anatomical forms of influenza: a) ..., b) ..., c)
2. What macroscopic changes are revealed in lungs in a severe form of influenza? What is the name of such a lung? a) ..., b) ..., c) ..., d) ..., e) ..., f) ..., g)
3. List complications of vaccination: a) ..., b) ..., c)
4. What are the causes of death in influenza?: a) ..., b) ..., c) ..., d)
5. In what organs do the morphological changes caused by classical typhus develop?: a) ..., b)
6. List kinds of malaria: a) ..., b) ..., c)
7. Autopsy has revealed enlargement of the spleen and liver, and hyperplasia of the marrow. The organs are dark grey. On microscopic examination, there is a marked hyperplasia of cells in these organs. The cerebral vessels have stases. The grey matter of the brain is dark slate. The white matter contains numerous microfocal haemorrhages and foci of necrosis. What disease is it? What caused the patient's death? Why are the organs grey?

Answers:

1. a) mild (out-patient), b) moderate, c) severe.
2. a) haemorrhage, b) foci of necrosis, c) foci of atelectasis, d) foci of emphysema, e) foci of suppuration, f) panbronchitis, g) "large motley influenzal lung".
3. a) postvaccinal meningo-encephalitis, b) necrosis of soft tissues in the area of vaccination, c) allergic eruption
4. a) intoxication, b) haemorrhages into vital centres, c) pulmonary complications, d) cardiac insufficiency.
5. a) nervous system, b) vessels.
6. a) tropical, b) three-days', c) four-days'.
7. Malaria, coma, deposits of hemomelanine.

Macropreparations:

1. *Haemorrhagic laryngotracheobronchitis in influenza*. Pay attention to the state of the tracheal mucosa: its appearance, color, presence of a film on its surface. Determine, what form of influenza this preparation demonstrates.

2. *Haemorrhagic pneumonia in influenza*. Pay attention to dimensions of the lung, its appearance on section; give the name of the preparation, explain the morphological picture of changes in the lung in influenza; indicate the form of influenza in this case.

3. *Spleen in malaria*. Describe its dimensions, state of the capsule, color on section. Explain, what causes a change in the color. List complications and causes of death in malaria patients.

4. *Skin in smallpox*. Describe appearance of ulcerous formations on the skin, explain mechanisms of their development. Name clinical-morphological forms, complications and causes of death in patients with smallpox.

Microspecimens:

No. 205 – *serous-desquamative viral pneumonia (stained with hematoxylin and eosin)*. Describe the state of the exudate in the alveoli and lumens of the bronchi; pay attention to changes in the alveolar septa and peribronchial tissue.

No. 88 – *viral-bacterial pneumonia (stained with hematoxylin and eosin)*. At a small magnification of the microscope, find foci of pneumonia. At a large magnification, study the state of the walls of the bronchi and alveoli. Determine the cellular contents of the exudate in the alveoli and lumens of the bronchi. Name the form of influenza characterized by these changes.

No. 223 – *typhogenic encephalitis (stained with hematoxylin and eosin)*. At a small magnification of the microscope, find foci of the inflammation; at a large magnification, study the cellular contents of Popov-Davydovsky granuloma. Pay attention to the character of blood filling in the brain substance; find changes characteristic of vasculitis in the capillaries and arterioles.

Control final knowledge:

Krok problem test

1. The disease in a male patient began with chills, an elevation of the body temperature up to 40°C, a headache, a cough, dyspnea. On the 5th day, under the phenomena of respiratory insufficiency, the patient died. On autopsy it was found that the lungs were enlarged and motley by appearance. Against a background of an impairment of circulation and massive haemorrhages, a microscopic examination revealed numerous foci of serous-haemorrhagic pneumonia, foci of an emphysema and atelectasis. What disease does such picture in the lungs characterize?

A. *Croupous pneumonia*

B. Adenovirus infection

*C. Influenza**

D. Respiratory-syncytial infection

E. Parainfluenza

2. A visual examination of the corpse of a 40-year-old male, who died from heart failure, revealed traces of a rash in the form of brown spots and points on his skin, as well as a conjunctival eruption. There were bedsores in the regions of the sacrum and spinous processes of the vertebrae, and paraffinomata in the places of subcutaneous injections of drugs. A microscopic examination of the CNS, skin, adrenal glands revealed destructive-proliferative endothrombo-vasculitis in the vessels of the microcirculation and small arteries of the above organs with presence of Popov's granulomata, and there was isolated myocarditis in the heart. Which of the diagnoses listed below was the most probable?

A. Kussmaul's disease

B. Q fever

C. Enteric fever

*D. Epidemic typhus**

E. HIV infection

3. A geologist, who several months before had been on an expedition in the Central Asia, had paroxysms of a fever, an icteric coloring of the skin, hypochromic anemia and loss of body mass during his life-time. On autopsy, a sharp enlargement of the spleen and liver, as well as hyperplasia of the marrow were found. Microscopically, there was haemomelanososis of the liver, spleen and marrow. What disease are such changes typical for?

A. Amoebiasis

B. Chronic septicemia

C. Epidemic typhus

*D. Malaria**

E. Relapsing fever

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Childhood infectious diseases (diphtheria, scarlet fever, measles, whooping cough, meningococcal infection)

Motivational characteristic of the subject: knowledge of morphological changes in the organism in childhood infectious diseases is necessary for formation of clinical-anatomical thinking in senior students when they study this pathology at the Department of Infectious Diseases.

The educational purpose and tasks of the lesson are as follows: discuss of etiology, epidemiology, pathogenesis and clinical-anatomical forms of childhood infectious diseases as well as their possible complications and peculiarities in their course owing to preventive inoculations given.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

- text tables: “Diphtheria (etiology)”, “Diphtheria (clinical-morphological manifestations)”, “Meningococcal meningitis”, “Measles (clinical-morphological manifestations)”, “Scarlet fever (clinical-morphological manifestations)”, “Scarlet fever (Stages of course)”, “Whooping cough (clinical-morphological manifestations)”;
- colour pictures: “Meningococcal infection”, “Measles”;
- slides: “Diphtheritic amygdalitis in diphtheria”, “Necrotic laryngitis”, “Epidemic cerebrospinal meningitis”;
- macropreparations: diphtheritic laryngotracheitis, heart in diphtheria, morbillous laryngotracheobronchitis, purulent meningitis, hydrocephaly, Henoch’s angina, multiple bronchiectasia of lungs;
- microspecimens: *No. 94* – laryngeal diphtheria, *No. 191* – peribronchial pneumonia in measles, *No. 86* – purulent leptomeningitis, *No. 190* – parenchymatous myocarditis (in diphtheria);

Questions to control basic knowledge:

1. Is diphtheria regarded as a childhood infectious disease?
2. Name local changes in diphtheria: a) enlargement of the tonsils, b) plethora and edema of the mucous coats of the fauces and tonsils, c) presence of whitish-yellowish films on the mucous coats, d) edema of the soft tissues of the neck, e) toxic myocarditis, f) necrotic nephrosis, g) enlargement of regional lymph nodes.
3. What childhood infections does Waterhouse-Friderichsen syndrome develop in: a) diphtheria, b) scarlet fever, c) whooping cough, d) measles, e) meningococcal infection?

4. Clinical-morphological forms of meningococcal infection: a) allergic, b) nasopharyngitis, c) meningococcal meningitis, d) haemorrhagic, e) meningococemia, f) toxic.
5. Morphological changes in measles: (1) local and (2) general: a) catarrhal inflammation of the fauces, b) that of the bronchi, c) that of the eye conjunctivae, d) exanthema, e) enanthema, f) metaplasia of the epithelium of the bronchi into a stratified squamous one.

Answers: 1 – yes. 2 – a, b, c, d, g. 3 – a, e. 4 – b, c, e. 5 – 1) a, b, c, d, f, g; 2) e.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Name the organs on whose membranes development of local changes is observed in measles: a) ..., b) ..., c) ..., d)
2. Name kinds of morbillous bronchitis depending upon the character of spreading of the inflammatory process: a) ..., b) ..., c) ..., d)
3. What morphological changes does the heart develop in diphtheria? a) ..., b)
4. List the main complications of diphtheria.
5. What causes the second (allergic) period of scarlet fever? a) ..., b)
6. List complications of the septic form of scarlet fever: a) ..., b) ..., c) ..., d) ..., e) ..., f)
7. Say what changes the lungs develop in whooping cough: a) ..., b) ..., c)
8. Autopsy of a girl, aged 5 years, has revealed the following changes: microfocal haemorrhages in the region of the buttocks, lower extremities, eyelids and on the sclerae, as well as serous pericarditis, and massive haemorrhages in the adrenal glands. It is known that the child died 25 hours after the onset of this disease. What is your diagnosis? What is the name of the syndrome which has developed?

Answers:

1. a) mucosa of the fauces, b) that of the trachea, c) that of the bronchi, d) the eye conjunctiva.
2. a) endobronchitis, b) mesobronchitis, c) panbronchitis, d) peribronchitis.
3. a) alterative myocarditis, b) interstitial myocarditis.
4. a) laryngeal diphtheria, b) descending croup, c) haemorrhages, ulcerations, d) pneumonia.
5. a) sensibilization of the body with a streptococcus, b) hyperergic response.
6. a) retro-pharyngeal abscess, b) otitis-antritis, c) purulent osteomyelitis of the temporal bone, d) cervical (Dupuytren's) phlegmon, e) brain abscesses, f) purulent meningitis.
7. a) interstitial emphysema, b) spontaneous pneumothorax, c) atelectasis.
8. Meningococcal infection, meningococemia, Waterhouse-Friderichsen syndrome.

Macropreparations:

1. *Diphtheritic laryngotracheobronchitis*. Describe the color of the mucous coat and character of fibrinous films, name the kind of the inflammation, list complications and give definitions to such notions as “laryngeal diphtheria” and “descending croup”.

2. *Heart in diphtheria*. Describe the size of the heart, state of its cavities, thickness of the myocardium, its color; name the morphological changes which the myocardium develops in diphtheria; list possible complications, name their cause and outcome.

3. *Morbillous laryngotracheobronchitis*. Describe the appearance of the preparation, the color of the laryngeal, tracheal and bronchial walls; explain what process causes this color; name the causative agent of measles and describe the pathogenesis of necrotic bronchitis: a) ..., b) ...; list other morphological signs of bronchitis in measles: a) ..., b) ..., c) ...; give examples of complications after necrotic bronchitis: a) ..., b) ..., c) ..., d)

4. *Purulent meningitis*. Give characteristics of blood filling in the pia mater, state of the gyri and sulci, the appearance of the exudate; name the form of meningococcal infection, say when meningitis develops, list its outcomes: a) ..., b) ...; list types of complications, name the cause of death.

5. *Hydrocephaly*. Describe the appearance of the brain, expressiveness of its gyri, volume of the lateral ventricular sinuses, thickness of the brain substance; name the pathological process in the cerebral hemispheres in hydrocephaly; list changes in the pia mater, say which of them are observed at the initial stages of the disease, list their etiology: a) ..., b) ...; explain the term “hydrocephaly”.

6. *Henoch's angina*. What changes have developed in the fauces? Describe the color and blood filling of the tonsillar mucosa; determine the mechanism of these changes; list possible complications, describe changes in regional lymph nodes.

7. *Multiple bronchiectasia of lungs*. Describe the appearance of the lung, state of the lumens in the bronchi, thickness of their walls, character of the exudate, pathogenesis of bronchiectasia, name the disease which results in such a complication, list its outcomes.

Get acquainted with slides on the electrified stand: “Diphtheritic amygdalitis in diphtheria”, “Necrotic laryngitis”, “Epidemic cerebrospinal leptomeningitis”.

Microspecimens:

No. 94 – *laryngeal diphtheria (stained with hematoxylin and eosin)*. At a small magnification, describe thickening of the mucous coat with presence of the fibrin-containing exudate which reaches the submucous layer, describe the state of the vessels; make differential diagnosis between the laryngeal diphtheria and descending croup; list possible complications of intubation and tracheostomy.

No. 190 – *parynchematous myocarditis (stained with hematoxylin and eosin)*. At a small magnification, describe foci of myolysis in the myocardium, plethora of vessels, as well as focal interstitial infiltration with lymphoid cells; name the pathological process, list possible outcomes.

No. 191 – *peribronchial pneumonia in measles (stained with hematoxylin and eosin)*. Describe the state of lumens in the bronchi, presence of some purulent exudate in them; pay attention to metaplasia of the cylindrical bronchial epithelium into a stratified squamous one, as well as infiltration of the bronchial wall with leukocytes. What are the main causes of the disease? List possible outcomes.

No. 86 – *purulent leptomeningitis (stained with hematoxylin and eosin)*. At small and large magnifications, describe thickening of the pia mater, its infiltration with some purulent exudate, vasodilatation of the pia mater. Name the type of the inflammation, the causative agent, complications and outcomes.

Control final knowledge:

Krok problem test

1. A 4-year-old boy was hospitalized to a resuscitation department due to a progressing drop of his blood pressure. Twenty-four hours after the moment of admission to the hospital the boy died from an uncontrolled collapse. A pathoanatomical examination revealed the following changes: macroscopically, there were diffuse subcutaneous haemorrhages with foci of necrosis, bilateral massive haemorrhages in the cortical layer of the both adrenal glands, ischemia of the cortical layer of the kidneys and hyperemia of the malpighian pyramids in the medullary layer. Histologically, a disseminated intravascular blood coagulation, a necrosis of the epithelium in the renal tubules, alterative changes in the liver, myocardium and brain were found. Diagnose the disease.

A. *Generalized viral infection*

B. *Septicemia*

C. *Septicopyaemia*

D. *Meningococchemia**

E. *Fulminant sepsis*

2. The disease in a child began with a high body temperature, a pain in the throat, some swelling of the submandibular lymph nodes. On visual examination of the fauces, its surface was edematous and moderately hyperemic, the tonsils were enlarged and covered with white-greyish films which were tightly united with the underlying tissues, any attempt to remove them caused formation of bleeding defects. What disease are the revealed changes typical for?

A. *Catarrhal angina*

B. *Scarlet fever*

C. *Diphtheria**

D. *Meningococcal infection*

3. A.C. is a four-year-old girl who is referred to hospital by her family doctor. She has presented with catarrhal inflammation in the mucous membrane of the mouth, trachea, bronchi, and conjunctiva. The mucous membrane is swollen, plethoric; the mucous secretion is increased, which is accompanied by rhinitis, cough, lacrimation. Enanthema is noted on the mucous membrane of the cheeks against the lesser lower molars. It looks like whitish spots called Belsky-Filatov-Koplik's spots, which develop before the eruption on the skin. What diagnosis is most probable?

*A. Measles**

B. Mumps

C. Infectious mononucleosis

D. Diphtheria

E. Scarlet fever

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson Tuberculosis

Motivational characteristic of the subject: knowledge of morphological manifestations of tuberculosis – a chronic infectious disease affecting all organs in the human body – is necessary for its further study at clinical departments and in the practical work of a physician.

The educational purpose and tasks of the lesson are as follows: to discuss etiology and pathogenesis, classification, clinical-anatomical forms of tuberculosis; while studying macropreparations in class, it is necessary to reveal and substantiate principles of the clinical-anatomical classification, the morphological characteristic of kinds of tuberculosis (primary, haematogenic and postprimary {reinfection}); to learn complications and outcomes of tuberculosis.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

- tables: “Primary tuberculosis”, “Haematogenic tuberculosis”, “Postprimary tuberculosis”, “Anatomical forms of progressive pulmonary tuberculosis”, “Scheme of tuberculosis development”, “Clinical classification of tuberculosis”, “Tuberculous granuloma (drawing)”, “Differential diagnosis of tuberculosis and syphilis”;
- slides: “Miliary pulmonary tuberculosis”, “Caseous pneumonia”, “Macrofocal pulmonary tuberculosis”, “Caseous tuberculous lymphadenitis”;
- macropreparations: primary pulmonary tuberculous complex; miliary tuberculosis of kidney and spleen; acute pulmonary cavern; tuberculous caseous bronchadenitis; primary intestinal tuberculous complex; tuberculosis of spine, uterus and uterine appendages; acute focal pulmonary tuberculosis; tuberculous caseous pneumonia; cirrhotic tuberculosis;
- microspecimens: *No. 201* – healed primary affection in lung (Ghon’s focus); *No. 109* – miliary pulmonary tuberculosis; *No. 111* – caseous pneumonia.

Questions to control basic knowledge

1. Is tuberculosis an acute disease?
2. List morphological signs in haematogenic generalizaion of primary tuberculosis: a) miliary tubercles in different organs, b) development of caseous pneumonia, c) development of Simon’s foci, d) appearance of foci of pneumosclerosis, e) development of tuberculous leptomeningitis.
3. Name ways of generalization of primary tuberculosis: a) perineural, b) lymphogenic, c) haematogenic, d) growth of primary affection, e) intracanalicular.

4. What are the peculiarities of primary tuberculosis? a) As a rule, it has the aerogenic way of infection; b) it begins mostly in adults; c) it occurs mostly in childhood; d) development of thrombophlebitis; e) development of obliteration of pleural cavities.
 5. Make differential diagnosis between clinical-morphological manifestations of primary and postprimary tuberculosis: a) primary tuberculous complex, b) foci of Abrikosov's reinfection, c) Aschoff's foci, d) miliary tuberculosis.
- Answers: 1 – no. 2 – a, b, c, e. 3 – b, c, d. 4 – a, c. 5 – primary (a, d), postprimary (b, c).

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. Ways of invasion of the causative agent of tuberculosis into the human organism: a) ..., b) ..., c) ..., d) ..., e)
2. Complications of postprimary tuberculosis: a) ..., b) ..., c) ..., d) ..., e)
3. What are Abrikosov's reinfection focus and Assmann-Redecker focus?
4. Name variants in the course of primary tuberculosis.
5. Clinical-morphological forms of postprimary tuberculosis.

Answers:

1. a) aerogenic, b) alimentary, c) through skin lesions, d) tonsils, e) placenta.
2. a) pulmonary haemorrhage, b) pneumothorax, c) pleural empyema, d) secondary amyloidosis, e) "pulmonary" heart.
3. a) fresh foci of postprimary tuberculosis, more frequently in segments I–II of the right lung, b) postprimary infiltrative tuberculosis, where perifocal inflammation prevails over caseous changes.
4. a) morphological healing and clinical recovery, b) progression via different ways, c) chronic course.
5. a) acute focal, b) fibrofocal, c) infiltrative-pneumonic, d) tuberculoma, e) acute caseous pneumonia, f) acute cavernous, g) fibrocavernous, h) cirrhotic, i) pulmonary tuberculosis in combination with occupational diseases.

Macropreparations:

1. *Primary pulmonary tuberculous complex*. Find components of the primary tuberculous complex. What age does it appear most frequently at? What kind of tuberculosis does it morphologically manifest? List processes taking place in healing of the primary tuberculous complex. Give the name of the primary tuberculous complex healed.

2. *Tuberculous leptomeningitis*. Point out the localization of the process. Describe the pia mater. What kind of the process progression does it appear in? What complications may develop?

3. *Renal tuberculosis*. Point out the localization of the process. Describe morphological changes in the kidney. What form of tuberculosis is it? List possible complications.

4. *Spinal tuberculosis*. Study and describe the macropreparation. What is the appearance of vertebral bodies and intervertebral disks? What form of tuberculosis is it?

5. *Fibrocavernous pulmonary tuberculosis*. Point out the localization of the process. Describe the appearance of the lung on section. Pay attention to the state of the cavity, the character of its walls. What does the surrounding pulmonary tissue look like? What are the ways for spreading of the process in the lung? What are the complications and causes of death?

Get acquainted with slides on the electrified stand: “Miliary pulmonary tuberculosis”, “Caseous pneumonia”, “Macrofocal pulmonary tuberculosis”, “Caseous tuberculous lymphadenitis”.

Microspecimens:

No. 201 – healed primary tuberculous focus (stained with hematoxylin and eosin). Describe morphology of Ghon’s focus. Name stages in the primary affection healing.

No. 111 – caseous pneumonia (stained with hematoxylin and eosin). Study the micropreparation. Specify, when tuberculosis develops exudative inflammation. Name outcomes of caseous pneumonia.

No. 109 – miliary pulmonary tuberculosis (stained with hematoxylin and eosin). This preparation is intended for demonstration purposes.

No. 75 – tuberculous caseous lymphadenitis (stained with hematoxylin and eosin). This preparation is intended for demonstration purposes.

Control final knowledge:

Krok problem test

1. An autopsy of a 17-year-old girl, who died from pulmonary insufficiency, revealed in the lower lobe of her right lung some confluent areas of caseous necrosis which were surrounded by fresh foci of an exudative inflammation; the bronchopulmonary, bronchial and bifurcation lymph nodes were characterized by phenomena of caseous necrosis. Which of the diagnoses listed below was the most probable?

- A. *Growth of primary affect in primary tuberculosis**
- B. *Haematogenic form in progression of primary tuberculosis*
- C. *Haematogenic tuberculosis with predominant affection of lungs*
- D. *Tuberculoma*
- E. *Caseous pneumonia in secondary tuberculosis*

2. A 48-year-old male died from progressing cardiopulmonary insufficiency. From his case history it is known that before he had been ill with primary tuberculosis. An autopsy revealed a pulmonary emphysema, reticular pneumosclerosis, white-grey foci with corticopleural localization and a hypertrophy of the right ventricle of the heart. The mesenterial lymph nodes had a picture of tuberculous lymphadenitis. On microscopic examination, the pulmonary tissue was characterized by prevalence of a productive tissue reaction with formation of tuberculous granulomata. What form of pulmonary tuberculosis is such a picture typical for?

A. *Acute focal*

B. *Fibrofocal*

C. *Infiltrative*

D. *Haematogenous-disseminated**

E. *Miliary*

3. A room for dissections received the body of a male with reduced nourishment, who was ill with pulmonary tuberculosis and died from cardiopulmonary insufficiency. On autopsy, the lungs were enlarged, dense, with a thickened pleura and fibrinous-purulent superpositions on it. On section, the lungs contained grey-yellow polysegmental foci which were confluent in the upper lobes and actually occupied the whole lobe. A microscopic examination revealed prevalence of necrotic changes over the perifocal ones. The first segment of the right lung had a Ghon's focus. Which of the diagnoses was the most probable?

A. *Infiltrative tuberculosis*

B. *Caseous pneumonia**

C. *Acute focal tuberculosis*

D. *Tuberculomata*

E. *Fibrofocal tuberculosis*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Lesson

Brucellosis. Plague. Tularemia. Anthrax. Sepsis

Motivational characteristic of the subject: knowledge of morphological changes in the organism in the above infections is necessary for studying brucellosis, plague, tularemia, anthrax and sepsis at clinical departments, and in the practical work of a doctor for clinical-anatomical analysis of autopsy material.

The educational purpose and tasks of the lesson are as follows: discuss of etiology, pathogenesis and classification, as well as morphological changes in the organs and tissues, clinical-morphological forms, complications, causes of death, pathomorphosis of brucellosis, plague, tularemia, anthrax and sepsis; ability to make a diagnosis on the basis of the knowledge about morphology of the above diseases; mastering of peculiarities of sepsis in children and those of stomatogenic sepsis.

Specific manuals for work on a practical class

Scientific and methodic foundation of the topic is defined at the beginning of classes. Then readiness for the class is checked by the test control.

The students (under teacher control) determine macrospecimens, slides, microspecimens on electrified stand and electronic micrographs.

Visual aids

- tables: “Brucellosis”, “Tularemia”, “Plague”, “Anthrax”, “Sepsis”, “Sepsis according to infection atrium”, “Classification of sepsis”, “Peculiarities of modern sepsis”, “Peculiarities of sepsis in children”;
- colour picture: “Haemorrhagic leptomeningitis in anthrax”;
- slides: “Embolic apostematous nephritis”, “Polypous-ulcerous endocarditis”;
- macropreparations: brain abscess, apostematous nephritis, septic spleen, polypous-ulcerous endocarditis, ulcerous skin lesions in chroniosepsis, septic endometritis;
- microspecimens: *No. 93* – embolic apostematous nephritis; *No. 182* – polypous-ulcerous endocarditis.

Questions to control basic knowledge

1. Is sepsis an infectious disease?
2. List peculiarities of sepsis that differentiate it from other diseases:
 - a) polyetiological character, b) contagiousness, c) absence of cycles in the course of the disease, d) specific anatomic pathology, e) strict specificity of the causative agent, f) monopathogenicity, g) it develops durable immunity, h) complications of the disease are more frequent.
3. Name clinical-anatomical forms of anthrax: a) cutaneous, b) cutaneobubonic, c) conjunctival, d) pulmonary, e) intestinal, f) septic.

4. List theories of pathogenesis of sepsis: a) infectious, b) compromise, c) polyetiological, d) reactological, e) viral.
5. Which of the mentioned signs belong to (1) local signs of sepsis, (2) general ones: a) dystrophic, b) infection atrium, c) inflammatory, d) septic focus, e) hyperplastic?

Answers: 1 – yes. 2 – a, c, f, h. 3 – a, c, d, e. 4 – a, b, d. 5 – 1) b, d; 2) a, c, e.

Stages of individual work in class

Discuss theoretical questions in the process of macro- and micro-specimens studying:

1. List peculiarities of sepsis: a) etiological, b) epidemiological, c) clinical, d) immunological.
2. Pathoanatomical changes in sepsis: a) local changes: 1) ..., 2) ..., 3) ..., 4) ..., 5) ..., 6) ..., 7) ..., 8) ... ; b) general changes: 1) ..., 2) ..., 3)
3. Name clinical-morphological forms of sepsis: a) ..., b) ..., c) ..., d)
4. Clinical-morphological forms of anthrax: a) ..., b) ..., c)
5. Two days after a criminal abortion the female patient's temperature elevated up to 40 °C, she was semiconscious, and there were numerous haemorrhages in her skin. She died three days later. What clinical-morphological form of sepsis and type of sepsis according to its infection atrium were there? What changes were observed near the infection atrium?

Answers:

1. a) polyetiological, b) noncontagious, c) absence of cycles in its course, d) it does not develop any immunity.
- 2a: 1) septic focus, 2) phlebitis, 3) thrombophlebitis, 4) lymphangitis, 5) lympho-thrombosis, 6) lymphadenitis, 7) arteritis, 8) thrombarteritis.
- 2b: 1) dystrophic, 2) inflammatory, 3) hyperplastic.
3. a) septicemia, b) septicopyemia, c) chroniosepsis, d) septic endometritis.
4. a) external, b) internal, c) primary septic.
5. Septi-cemia, uterine sepsis, septic endometritis.

Macropreparations:

1. *Septic endometritis*. Determine dimensions of the uterus and thickness of its wall, describe the state of the mucous membrane. What manifestations of sepsis (local or general) do these changes belong to and what are they called?

2. *Pulmonary abscess*. Describe the cavity in the lungs, the state of its walls. What clinical-anatomical form of sepsis does this preparation manifest?

3. *Brain abscess*. Describe the appearance of the cavity in the brain. What is the cavity filled with? What is the state of its walls? What is the source of infection? What is the name of this form of sepsis according to its infection atrium?

4. *Apostematous nephritis*. Describe the size of the kidney, presence of greyish-yellowish pus-containing microfoci on its surface and on section. What is the name of this form of sepsis according to its infection aetrium?

5. *Septic spleen*. Describe the size of the organ, the state of its capsule, color on section, presence of scraping. What is the name of such a spleen? What kinds of septic manifestations are they: general or local?

6. *Ulcerous skin lesions in chroniosepsis*. Describe ulcerous changes in the skin. List manifestations of chroniosepsis.

7. *Polypous-ulcerous endocarditis*. Describe the size of the heart, volume of its chambers, thickness of ventricular walls, state of the valvular cusps and presence of fibrinous warty formations on them.

Microspecimens:

No. 93 – *embolic apostematous nephritis (stained with hematoxylin and eosin)*. At a small magnification of the microscope, find foci of suppurative inflammation and bacterial emboli; at a large magnification, determine cellular contents of the exudate. What clinical-anatomical form of sepsis does this preparation manifest?

No. 182 – *polypous-ulcerous endocarditis (stained with hematoxylin and eosin)*. Describe the state of the valvular cusps, pay attention to the character of old and fresh destructive changes. Find colonies of bacteria in sedimentations on the cusps and determine cellular contents of the infiltrate near the base of the cusps.

Control final knowledge:

Krok problem test

1. Three days after a criminal abortion a female developed an elevation of her body temperature up to 40 °C, cloudiness of consciousness, petechial haemorrhages on her skin. Two days later she died under increasing phenomena of intoxication. An autopsy revealed jaundice, petechial haemorrhages in the serous and mucous membranes, a sharp enlargement of the spleen and lymph nodes. Microscopically, the spleen and lymph nodes were characterized by a proliferation of the lymphoid and reticular cells, as well as a large number of immature forms of haemopoiesis. Besides, there were dystrophic changes and an interstitial inflammation in the liver, kidneys, heart, as well as disseminated necrotic vasculitis. What was the most probable form of sepsis?

A. *Septicopyaemia*

B. *Chernogubov's disease*

C. *Septicemia**

D. *Chronic sepsis*

E. *Fulminant sepsis*

2. An autopsy of a 40-year-old male, who worked as a sheep-breeder and died from a severe intoxication, revealed on the skin some papulopustular haemorrhagic rash with necroses and ulcerations, as well as enlarged immovable dark red lymph nodes in the inguinal region which were united with one another and had a doughy consistency. The spleen was enlarged, flaccid and had an abundant scrape. Microscopically, the lungs revealed a focal serous-haemorrhagic inflammation with necroses; the heart, liver and kidneys were characterized by dystrophic and necrotic changes; the lymph nodes had haemorrhagic-necrotic lymphadenitis with some purulent melting. Make a diagnosis.

A. *Bubocutaneous form of plague*

B. *Bubonic plague**

C. *Primary pneumonic plague*

D. *Septicemic plague*

E. *Septicemia*

3. A male cattle-farm worker acutely fell ill and died under the phenomena of intoxication. An autopsy revealed an enlarged flaccid spleen, which was dark cherry on section and gave an abundant scrape. The pia mater of the vault and base of the skull were dark red and edematous (a “cardinal’s cap”). Microscopically, there was a serous-haemorrhagic inflammation of the meninges and cerebral tissues with destruction of the walls of small vessels. What was the most probable diagnosis?

A. *Tularaemia*

B. *Anthrax**

C. *Brucellosis*

D. *Plague*

E. *Meningococcal meningoencephalitis*

The class is finished with analysis of the results of each student individual work by checking of macro- and microspecimens description and final test control.

Навчальне видання

СИСТЕМНА ПАТОЛОГІЧНА АНАТОМІЯ

*Методичні розробки
до занять з патоморфології
для англomовних викладачів медичних закладів*

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SYSTEMIC PATHOLOGIC ANATOMY

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