„A” topic

GENERAL PATHOLOGY

I. POSTMORTEM SIGNS – NECROSIS

1. Postmortem changes, causes and mechanisms of cellular damage and cell death
   - Causes, morphology and mechanism of cell necrosis
   - Reperfusion injury

2. Macroscopic and microscopic characterization of necrosis types with organ examples
   - Coagulative necrosis and its organ manifestation
   - Colliquative necrosis and its organ manifestation
   - Hemorrhagic infarction and its organ manifestation
   - Fat, caseous and fibrinoid necrosis and its organ manifestation
   - Acute myocardial infarction
   - Cerebral infarction

3. Morphology and pathogenesis of apoptosis

II. DEGENERATIONS, ACCUMULATIONS, PIGMENT FORMATION

4. Degenerations, intracellular accumulations and pigments
   - Reversible cell injury, types of degeneration and its organ manifestation
   - Types of fatty degeneration and its organ manifestation
   - Hyaline accumulation and its organ manifestation
   - Anthracosis, lipofuscin and hemosiderin accumulation

5. Dystrophic and metastatic calcification, pathomechanism and clinic-pathology of stone formation
   - Dystrophic calcification and its organ manifestation
   - Metastatic calcification and its organ manifestation
   - Stone formation; kidney and gallbladder stones

6. General features of amyloidosis: physicochemical, ultrastructural and histochemical characterization, types of amyloid, clinico-pathology of amyloidosis

III. DISORDERS OF GROWTH

7. Definition and pathomechanism of hyperplasia, metaplasia, hypertrophy, atrophy, pathogenesis and organ examples
   - Pathomechanism of atrophy and hypertrophy, examples
   - Myocardial hypertrophy and its clinical forms
   - Pathomechanism of hyperplasia, examples
   - Pathomechanism of metaplasia and dysplasia, examples

IV. PATHOLOGY OF CIRCULATION

8. Definition of edema, pathogenesis (Frank-Starling law), clinical forms

9. Venous circular dysfunctions. Stasis and its complications

10. Pathogenesis and types of thrombosis, thromboembolic complications. Special types of emboli
    - Causes and types of thrombosis
    - Types of emboli

11. Arterial circular dysfunctions. Bleedings. Vascular occlusion, types of infarctions
    - Types of hemorrhages and their clinical presentation
    - Intracranial hemorrhages

12. Forms of shock and its effects on organs. Definition, pathogenesis and consequences of DIC
    - Causes and types of shock
    - DIC

V. INFLAMMATION

13. Vascular and cellular mechanisms of acute inflammation, chemical mediators

14. Morphologic patterns of acute inflammation according to the type of exudate, examples

15. Definition of chronic inflammation, etiological factors, cellular and humoral mechanisms. Regeneration, reparation, wound healing
    - Chronic inflammation, fibrosis, scarring
    - Tissue repair, wound healing

16. Granuloma, granulomatous inflammation

VI. IMMUNOPATHOLOGY

17. Type I-II hypersensitivity reactions. Clinical and pathologic manifestations

18. Type III-IV hypersensitivity reactions. Clinical and pathologic manifestations

19. Major morphologic signs of systemic lupus erythematosus, Sjögren's syndrome, rheumatoid arthritis, scleroderma
    - Pathomechanism of autoimmune diseases
    - Systemic lupus erythematodes, rheumatoid arthritis
    - Sjögren's syndrome, scleroderma, polyarteritis nodosa

20. Pathology of transplantation

21. Pathology of inherited and acquired immunodeficiency diseases – examples
    - Inherited and acquired immunodeficiency syndromes
    - AIDS

VII. GENETIC DISEASES

22. Diagnostics of genetic disorders

23. Autosomal dominant, autosomal recessive and X-linked inheritance disorders
    - Autosomal dominant disorders
    - Familial hypercholesterinemia
    - Autosomal recessive and X-linked inheritance disorders

24. Disorders caused by chromosomal aberrations

VIII. ENVIRONMENTAL CAUSES OF DISEASE

25. Effects of tobacco and air pollution

26. Effects of alcohol and related diseases

„B" topic

IX. NEOPLASIA

1. Epidemiology, incidence and mortality of neoplastic diseases

2. Physical, chemical, radiation and microbial carcinogenesis
- Viral and microbial carcinogenesis
- Chemical and radiation carcinogenesis

3. General characteristics of benign and malignant tumors, growth, local spread and metastasis, forms of metastasis
- General characteristics of neoplasms (benign, malignant tumors)
- Characteristics of neoplasms rate growth
- Invasion and metastasis of neoplasms

4. Development and morphology of precancerous lesions

5. Categorization of tumors according to histological type

6. Grading and staging of cancer

7. Paraneoplastic syndromes, serum tumor markers

8. Molecular mechanisms of tumor development, oncogenes, tumor suppressor genes and epigenetic factors
- Promotion mechanisms of oncogenes and role in carcinogenesis
- Inhibitory mechanisms of tumor suppressor genes and role in carcinogenesis
- EGFR, ABL and BCL2 genes and their roles in tumor development
- RB, p53 and APC genes and their roles in tumor development
- BRCA1, BRCA2 and ATM genes and their roles in tumor development
- DNA repair genes and role in carcinogenesis
- Cytogenetic aberrations and the role of telomere in carcinogenesis
- Epigenetic changes (DNA methylation, MicroRNAs) and role in carcinogenesis

9. Inherited cancer syndromes

10. Cytological, histological diagnosis of tumors, immunohistochemistry and molecular diagnostic tools

ORGAN-SPECIFIC PATHOLOGY

X. PATOLOGY OF THE CARDIOVASCULAR SYSTEM

11. Congenital and acquired structural disorders of the cardiovascular system
    - Congenital heart diseases
    - Degenerative valvular heart disease (calcific aorta stenosis, mitral prolapse)
    - Valvular disease and their consequences

12. Pathogenesis, morphology and complications of atherosclerosis

13. Inflammatory heart diseases (endocarditis, myocarditis, pancarditis)
    - Rheumatic fever and rheumatic myocarditis
    - Infective endocarditis (acute and subacute)
    - Non-infectious endocarditis (thrombotic endocarditis, Libman-Sacks endocarditis)
    - Myocarditis and Cardiomyopathies

14. Cardiomyopathies

15. Pathogenesis, categorization and clinic-pathological features of vasculitis

16. Morphology and complications of acute myocardial infarction

17. Angina pectoris, chronic ischemic heart disease, sudden cardiac death

18. Etiology of heart failure, its effects on organs
    - Pathomechanism of cardiac insufficiency
    - Left-sided heart failure
    - Right-sided heart failure

„C” topic

XI. PATHOLOGY OF THE HEAD AND NECK REGION AND RESPIRATORY TRACT

1. Congenital malformations and inflammations of the head and neck region
    - Inflammatory lesions of the upper respiratory tract
    - Pathology of lips, oral cavity and pharynx

2. Tumors of the oral cavity, pharynx and larynx
    - Tumors of nasal passages, nasopharynx and larynx
    - Pathology of lips, oral cavity and pharynx

3. Pathology of the salivary glands

4. Diseases of vascular origin of the lung, atelectasis
    - Atelectasis and acute respiratory distress syndrome
    - Pulmonary diseases of vascular origin - pulmonary embolism, hemorrhage, and infarction

5. Chronic bronchitis, emphysema, bronchiectasis, bronchial asthma, cystic fibrosis
    - Cystic fibrosis
    - Obstructive lung diseases – bronchial asthma and emphysema
    - Obstructive lung diseases – chronic bronchitis and bronchiectasis

6. Chronic restrictive pulmonary diseases, pneumoconiosis

7. Infections of the lung (except tuberculosis)

8. Tuberculosis

9. Tumors of the lung and pleura
    - Benign and metastatic tumors of lung
    - Malignant lung tumors
    - Pathology of pleura

XII. PATHOLOGY OF THE GASTROINTESTINAL TRACT

10. Pathology of the esophagus

11. Inflammatory diseases of the stomach

12. Pathogenesis, morphology and complications of peptic ulcer

13. Tumors of the stomach

14. Developmental anomalies of the gastrointestinal tract

15. Non-neoplastic lesions of the bowel (malabsorption, enterocolitis)
    - malabsorption syndrome
    - Enterocolitis

16. Non-neoplastic lesions of the bowel (vascular disorders, diverticulosis, ileus)
    - Developmental anomalies and vascular disorders of the GI tract
    - Colonic diverticulosis and bowel obstruction

17. Inflammatory bowel diseases

18. Tumors of the small and large intestine (polyps, carcinomas)

19. Pathology of the appendix

20. Neuroendocrine tumors of the gastrointestinal tract, lymphoma, GIST

XIII. PATHOLOGY OF THE LIVER, BILIARY TRACT, AND PANCREAS

21. Cholestasis (PSC, PBC, cholelithiasis, jaundice)
    - Cholestasis (PSC, PBC)
    - Pathophysiology of jaundice, defects of bilirubin and bile formation. Cholelithiasis

22. Circulatory disorders of liver, toxic and drug-induced liver damage
    - Circulatory disorders of liver
    - Alcohol-, drug-induced and toxic liver disease

23. Acute and chronic hepatitis

24. Liver cirrhosis and its complications

25. Inherited liver disease, congenital malformations of the bile ducts

26. Tumors of the liver

27. Non-neoplastic lesions of the bile ducts and gallbladder

28. Acute pancreatitis and its complications

29. Forms of chronic pancreatitis, pathogenesis, complications

30. Tumors of the pancreas

XIV. PATHOLOGY OF THE KIDNEY AND THE URINARY TRACT

31. End-stage kidney and renal failure

32. Developmental abnormalities and cystic diseases of the kidney

33. Pyelonephritis

33. Pathogenesis of glomerular diseases, nephritic and nephrotic syndrome, hematuria
    - Pathogenesis of glomerular diseases
    - The nephritic syndrome
    - The nephrotic syndrome
    - Rapidly progressive glomerulonephritis
    - Systemic diseases associated glomerular damage

35. Tubular, interstitial and vascular diseases of the kidney, nephrosclerosis
    - Vascular diseases of the kidney
    - Acute tubular necrosis (ATN)

36. Tumors of kidney

37. Non-neoplastic diseases of the urinary tract: urolithiasis and obstructive uropathy, hydronephrosis, urocystitis

38. Tumors of the urinary bladder and the urinary tract

XVI. PATHOLOGY OF THE FEMALE GENITAL SYSTEM AND THE BREAST

39. Pathology of the vulva and the vagina

40. Inflammations, tumor-like lesions and tumors of the cervix. Precancerous lesions. Pathological aspects of cervical cancer screening

41. Tumors of the endometrium and myometrium

42. Dysfunctional uterine bleeding its pathological aspects

43. Endometriosis, adenomyosis. Pathology of female infertility

44. Non-neoplastic diseases of the ovary and fallopian tubes: inflammation, cysts

45. Tumors of the ovarium and fallopian tube

46. Pathology of pregnancy (dysfunctions of implantation, trophoblastic tumors)

47. Perinatal pathology (transplacental infections, chromosomal disorders, etiology and consequence of premature birth)
    - Pathogeneis of congenital anomalies
    - Disorders associated with prematurity (IRDS, NEC)
    - Sudden Infant Death
    - Fetal Hydrops

48. Inflammations and fibrocystic changes of the breast, fibroepithelial tumors

49. Precancerous lesions and cancer types of the breast, breast cancer screening

XVI. PATHOLOGY OF THE MALE GENITAL SYSTEM

50. Diseases of the penis and the scrotum, pathology of the sexually transmitted diseases
    - Diseases of penis, scrotum and spermatic cord
    - Sexually transmitted diseases

51. Prostatitis, nodular hyperplasia of the prostate, complications

52. Tumors of the prostate

53. Congenital malformations and inflammatory lesions of the testis and epididymis, male infertility

54. Tumors of the testis, categorization, tumor markers

XVII. PATHOLOGY OF THE ENDOCRINE SYSTEM

55. Pathology of the hypothalamic-hypophysis system

56. Special organic and histological alterations in diabetes mellitus
    - Diabetes mellitus
    - Diabetic nephropathy

57. Pathology of parathyroid glands

58. Non-neoplastic diseases of the thyroid gland

59. Tumors of the thyroid gland

60. Pathology of the adrenal gland

61. Multiple endocrine neoplasia (MEN) syndrome

XVIII. PATHOLOGY OF THE SKELETAL SYSTEM

62. Inflammatory, metabolic and degenerative bone and joint diseases
    - Congenital diseases of bone. Bone lesions related to endocrine syndromes
    - Osteoporosis, rickets, osteomalacia
    - Osteomyelitis. Paget’s disease

63. Benign and malignant bone tumors, tumor-like lesions
    - Tumors and tumor-like lesions of the bone

XIX. PATHOLOGY OF THE SKIN

64. Inflammatory skin diseases and major morphologic types
    - Inflammatory skin diseases (acute and chronic dermatitis, infective dermatitis)
    - Blistering skin disorders (Pemphigus, bullous pemphigoid, dermatitis herpetiformis)

65. Epithelial skin and adnexal tumors

66. Melanocytic tumors
    - Melanocytic skin lesions
    - Pigment cell tumors of the skin

XX. PATHOLOGY OF THE CENTRAL NERVOUS SYSTEM

67. Brain edema, hydrocephalus, congenital malformations of the central nervous system
    - Pathology of raised intracranial pressure
    - Congenital malformations of central nervous system

68. Dementia and neurodegenerative disorders, demyelinating diseases, prion disease
    - Degenerative diseases and dementias
    - Prion diseasse
    - Primary diseases of myelin. Acquired metabolic and toxic disturbances of the brain

69. Inflammatory diseases of the central nervous system

70. Cerebrovascular diseases, types of intracranial hemorrhage, ischemic disorders
    - Ischemia in the central nervous system
    - Intracranial hemorrhage

71. Tumors of the central and peripheral nervous system

XXI. PATHOLOGY OF THE HEMATOPOIETIC AND LYMPHOID SYSTEM

72. Non-neoplastic disorders of the hematopoietic system (anemia and polycythemia)
    - Anemias of diminished erythropoiesis
    - Anemias related to increased loss of red blood cells
    - Polycythemia vera and essential thrombocythemia
    - Non-neoplastic disorders of myeloid and lymphoid system

73. Neoplastic diseases of the hematopoietic system (types of leukemia)
    - Chronic myelogenous leukemia, chronic idiopathic myelofibrosis
    - Myelodysplastic syndromes
    - Acute myelogenous leukemia

74. Non-neoplastic disorders of the lymphoid system (reactive lymphadenopathy)

75. Neoplastic diseases of the lymphoid system (types of lymphomas)
    - Categorization bases of lymphomas
    - Precursor T- and B-cell lymphoblastic leukemia/lymphoma
    - Chronic lymphocytic leukemia, hairy cell leukemia
    - Multiple myeloma and related plasma cell disorders
    - Follicular lymphoma, mantle cell lymphoma, MALT-lymphoma
    - Diffuse large B-cell lymphoma, Burkitt lymphoma
    - Mycosis fungoides, peripheral T-cell lymphoma, anaplastic large cell lymphoma
    - Hodgkin-lymphoma

76. Pathology of the spleen