МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВЯ УКРАЇНИ
Харківський національний медичний університет

Manual for individual working for English-speaking medical students on the pathomorphology practical classes

Методичні вказівки для самостійної роботи студентів медичних вузів з англійською мовою навчання на практичних заняттях з патоморфології

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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 intended for the English-medium students of the medical and dentistry faculties. It can be used in class as additional material during independent work with histological slides and macrospecimens.

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

For a practical class of 2 hour duration 50 min for independent work of the students is recommended.

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

References:

1. Сорокіна І. В. Pathological anatomy. Патологічна анатомія : підруч. для студентів / І. В. Сорокіна, А.Ф. Яковцова. – Харків : Факт, 2004. – 648 с.

2. Sorokina I. V. Lectures in Pathological anatomy / I. V. Sorokina, A. F. Yakovtsova. – Kharkiv : Tornado, 2000. – 254 p.

3. Kumar V. Robbins Basic Pathology / V. Kumar, A. K. Abbas, J. C. Aster. – Canada : Elsevier Health Sciences, 2013. – 910 p.

4. Anderson's Pathology // Edited by John M. Kissane. The C. V. Mosby Company. – Toronto. Philadelphia, 1990. – 2196 p.

5. Thomas C. Macropathology / C. Thomas. – Toronto, Philadelphia : B. C. Decker Inc., 1990. – 355 p.

6. Thomas C. Histopathology / C. Thomas. – Toronto, Philadelphia : B. C. Decker Inc., 1989. – 386 p.

MACROSPECIMEN'S DESCRIPTION PLAN

In diffuse affection of organ:

- Organ identification (the hole organ or just the part of it)
- Size of an organ (increased, reduced; how many times)
- The character of merges
- Consistence (dense, soft, flabby)
- Description of a surface (capsule): presence of tuberosity (corrugation), fibrin, adhesions.
- Description of pathological changes on a cut section
- Conclusion (suggest or indicate the name of the pathological process)

In local affection of organ:

- Pathological focus (focuses) localization
- Size, diameter
- Shape
- Color
- Consistence
- Presence (expressiveness) of the borders
- State (changes) of the surrounding tissues
- Conclusion (suggest or indicate the name of the pathological process)

MICROSPECIMEN'S (SLIDE) DESCRIPTION PLAN

- Staining identification
- Identification of the organ (tissue)
- Identification and description of the pathological process
- Identification of the stroma's development degree
- Characteristic of the vascular bed (blood filling degree, thickness of the vascular wall)
- Conclusion (indicate the name of the pathological process)

Main methods of staining

Histologic

1) Hematoxylin and eosin (H.&E.) – Hematoxylin (stains the nucleuses which have basic medium /enviroment/ blue-violet), eosin (stains more acid cytoplasm of tissue cells pink);

2) Van Gieson's Picric Acid Fuchsin – it is used for identification of connective tissue which is stained brown-pink, surrounding tissue is stained yellow-green, nucleuses – black.

Histochemistric:

Identification (determination) of fat(s)

1. Sudan III → red-orange ← **2.** Scharlach

3. Sudan IV → black ← **4.** Osmium tetroxide

5. Nile blue

Fatty acids are stained red, neutral fats – blue – pale-blue (sky-blue)

Determination of glycogen

1) Best's carmine stains glycogen red

2) Shabadash reaction – in red-blue

3, 4) (PAS Reaction) Periodic Acid-Schiff's, Mak-Manus' method – pink-lilac

Determination of nucleic acids

DNA – Feulgen-Rossenbekk's reaction

RNA – Brachet's reaction

Determination of protein – Danielli's and Milo reaction

Determination of iron – Perl's reaction (Prussian Blue)

Determination of copper – Okamoto's method with application of rubeanic acid

Determination of potassium – Mc Callum's reaction

Determination of bilirubin – Endrashik-Groff's reaction

Determination of amyloid

Iodine green ↓ Green

Congo red ↓ Surrounding tissues are stained pale-yellow-pink

Amyloid is stained **red** in **all** four methods of staining

Gentian violet and methyl violet ↓ Lilac color

TOPIC: ALTERATION

DEGENERATIONS

№ 169

Keratinizing type of squamous carcinoma of the skin

(H.&E. Under low and higher magnification)

Microscopically the tumor shows papillary growth pattern and well formed keratin "pearls" in the whorls of malignant squamous cells.

№ 44

Fatty degeneration of the liver

(H.&E. Sudan III. Under low magnification)

Microscopically there are a lot of fat vacuoles in the cytoplasm of hepatocytes, mainly in the peripheral region of the hepatic lobules. Stained with Sudan III fat looks like red drops, but stained with H.&E. fat looks like emptiness.

№ 52

Glycogen in the kidneys

(Shabadash reaction. Under low and higher magnification)

Microscopically accumulation of glycogen grains and granules in the lumens and epithelium of the convoluted tubules is revealed. The glycogen grains are raspberry colored.

№ 32

Muciod swelling of the aorta wall

(Toluidine blue. Under low magnification)

Microscopically in the area of mucoid swelling a pink-violet color is revealed. Unchanged aortic wall is blue.

№ 36

Hyalinosis of central arteries of spleen

(H.&E. Under low magnification)

Microscopically in the spleen there are numerous vessels with the thickened wall, narrowed lumens, part of them are obliterated. Hyaline is accumulated in subendotelial areas of the vascular wall.

№ 38

Amyloidosis of the spleen (Sago-like spleen)

(H.&E. and Congo-red. Under low magnification)

Microscopically in the follicles of the spleen amyloid is accumulated along the reticular net and in the walls of the vessels, occasionally in the wall of central follicular artery. Amyloid is stained red with Congo red.

№ 43

Obesity of the heart

(H.&E. Under low magnification)

Microscopically there is a lot of subepicardial fat, which invades myocardial stroma, causing atrophy of myocardiocyties. Stained with hemotoxylin and eosin fat looks like emptiness formed at the place of fat location.

№ 42

Amyloidosis of the liver

(Congo-red. Under higher and low magnification)

Microscopically amyloid is accumulated along the reticular and collagen fibers as well as in the vascular walls. Stained with Congo red amiloid has red color.

№ 2-3

Brown induration of the lungs

(H.&E. Prussian blue reaction. Under higher and low magnification)

Microscopically there are a lot of brown (in H.&E. staining) pigments in the interalveolar septas, vascular walls as well as in the alveoli of the lungs. In Prussian blue reaction hemosiderin stains greenish-blue. Besides connective tissue is observed, which grows around the hemosiderin deposits.

№ 67

Liver in mechanical (posthepatic) jaundice

(H.&E. Under low and higher magnification)

Microscopically the interlobular ducts of the hepatic lobules are distended. Dark-brown bile is accumulated in the lumen of the hepatic ducts. There are sighs of fat degeneration and necrosis in the cytoplasm of hepatocyties.

№ 67

Melanoblastoma of the skin

(H.&E. Under low magnification)

Microscopically there are a lot of deposits of melanin in the skin. Melanin is stained by H.&E. in dark-brown color.

№ 59

Calcificated fibromyoma of the uterus.

(H.&E. Under low magnification)

Microscopically there are calcium salts: deeply basophylic, irregular and granular clumps in the tissues of the fibromyoma of the uterus.

NECROSIS

№ 73

Necrosis of the renal epithelium.

(H.&E. Under low and higher magnification)

Microscopically within the epithelium of proximal and distal tubules the following changes are observed: the cell swelling, absence of nucleus, homogenic cytoplasm, the narrowing of the tubule's lumen and a lot of eosinophilic grains in them.

№ 61

White with hemorrhagic rim infarctions of kidney.

(H.&E. Under low and higher magnification)

Microscopically there is an area or necrosis tissues in the kidney. The cell's cytoplasm is homogeneous and the nuclei are absent. Necrosis zone is limited from a healthy tissue by a demarcation inflammation (as a rule neutrofile infiltration).

EXAMPLES OF MACROSPECIMEN'S DESCRIPTION:

Ichtyosis: full-term fetus with dull pale dry thick s kin with uneven surface and presence of multiple deep fissures predominantly on extremities and on perioral area.

Glazed spleen: capsule of the spleen is irregularly thickened, white, and nontransparent.

Sebaseous spleen: spleen is enlarged, dense, with greasy luster on a cut surface.

Brown induration of the lungs: parenchyma of the lung is rusty-brown and dense.

Wet gangrene of a foot: the foot is enlarged in size, its skin is black color and macerated, the demarcation line is not clear.

TOPIC: DISTURBANCE OF BLOOD & LYMPH CIRCULATION

№ 1
«Nutmeg» liver

(H.&E. Under low and higher magnification)

Microscopically the veins and sinusoids are plethoric, diapedesis of erythrocytes and fat degeneration of hepatocytes in the peripheral region are observed.

№ 11
Diapedetic hemorrhages in the brain

(H.&E. Under low and higher magnification)

Microscopically diapedesis of erythrocytes with formation of diapedesis haemorrhages is observed. The arteries are plethoric.

№ 67
Liver under mechanical jaundice. (Posthepatic jaundice)

(H.&E. Under low and higher magnification)

Microscopically enlargement of luman of bile ducts, growth of connective tissue around bile ducts, necrosis of hepatocyties around bile ducts.

№ 4
Thrombophlebitis

(H.&E. Under low and higher magnification)

Microscopically there are a lot of leucocytes in the wall of the veins. The thrombus is attached to the vascular wall. It's composed of thrombocytes, fibrin, erythrocytes, and leukocytes.

№ 7
Haemorragic (red) infarction of the lung

(H.&E. Low and higher magnification)

Microscopically there is an area of red necrotic tissue in the lung. Necrotic zone is limited from a healthy tissue by a demarcation inflammation.

EXAMPLES OF MACROSPECIMEN'S DESCRIPTION:

Nutmeg liver: liver is dense, on a cut section has brownish-yellowish color with red dots.

Anemic infarction of the spleen: on a cut section there is white focus, wedge-shaped base of which is directed to the capsule of organ.

TOPIC: INFLAMMATION

№ 86

Fibrinopurulent pericarditis

(H.&E. Under low and higher magnification)

Microscopically at very low magnification 3 layers (muscle, fat and fibrin) are visible. The epicardium is thickened and covered by fibrin, which is painted bright-pink. There are a lot of leucocytes, histiocytes, lymphocytes in the epicardium.

№ 87

Purulent leptomeningitis

(H.&E. Under low and higher magnification)

Microscopically there is cellular infiltration of the leptomeninges. These cells are polymorphonuclear leukocytes. There are numerous fibrin threads between the cellular aggregates. The vessels are plethoric.

№ 90

Croupous pneumonia

(H.&E. Under low and higher magnification)

Microscopically there is fibrin exudation into the lumens of alveoli. The exudate contains numerous erythrocytes, leukocytes and fibrin. Vascular hyperemia is observed.

№ 109

Miliary tuberculosis of the lung

(H.&E. Under low and higher magnification)

Microscopically low magnification shows pulmonary tissue with many small nodules. Under higher magnification of the nodule there is small area of eosinophilic necrosis in the centre, surrounded by a wall of epithelioid cells and lymphocytes with giant cells (Langhans' cells).

№ 125

Syphilitic mesoaortitis

(Van-Gieson's stain. Under low and higher magnification)

Microscopically low magnification shows the characteristic "mouth-eaten" appearance of the elastic membrane of the media of the aorta. In the adventitia there is a proliferation of collagen fibers. The larger part of the media is replaced by focally distributed, cell-poor scar tissue. The intima is thickened by high-grade secondary sclerosis.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Croupous pneumonia: lung is enlarged, dense and heavy, with grayish-whitish plaques on the pleura; on a cut section lung parenchyma is grey, airless, resembles tissue of a liver.

TOPIC: IMMUNOPATHOLOGICAL PROCESSES

№ 8

Chronic tonsillitis

(H.&E. Under low and higher magnification)

Microscopically T-zone and B-zone hyperplasia is observed. Macrophages and plasmatic cells appear as well as their blasts. Vascular endothelium is swollen; there are lymphocytes in the lumen.

№ 10

Hasimoto's goiter

(H.&E. Under low and higher magnification)

Microscopically destruction and atrophy of the parenchyma of thyroid gland are observed. There are a lot of lymph follicles in the connective tissue.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Spleen at antigenic stimulation: spleen is enlarged, splenic capsule is tensed, cut section is plethoric, gives an abundant scrape

TOPIC: REGENERATION. WOUND HEALING. COMPENSATORY AND ADAPTIVE PROCESSES

№ 144

Myocardial hypertrophy

(H.&E. Under low and higher magnification)

Microscopically the muscle fibers are enlarged, the number of nuclei per field is definitely decreased, but nuclei are enlarged, bizarre and very hyperchromatic.

№ 145

Adenomatous hyperplasia of the endometrium

(H.&E. Under low and higher magnification)

Microscopically small, nondilated glands are seen lying "back-to-back". Each gland consists of an irregularly layered, tall, columnar epithelium, showing numerous mitoses.

№ 146

Granulation tissue

(Under low and higher magnification)

Microscopically, various connective tissue cells (fibroblast, fibrocytes, histiocytes, epitheliocytes) and an exuberant capillary proliferation are observed.

№ 22

Pulmonary emphysema

(H.&E. Under low and higher magnification)

Microscopically, there are areas of markedly enlarged alveolar air spaces. The alveoli septa are very small, frequently torn, and projecting into the alveolar space.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Hydronephrosis: The kidney resembles of thin-walled sac filled with urine with a severe expansion of the renal pelvis and atrophy of the renal parenchyma

Myocardial hypertrophy: on a cut section myocardial thickness of the left ventricle is 2,0cm (N – 1,2cm)

TOPIC: TUMORS

№ 151

Fibromyoma of the uterus

(Van-Gieson. Under low and higher magnification)

Microscopically there are smooth muscle fibers with elongated, nuclei and cytoplasm that stains yellow with van Gieson's stain. Between the smooth muscle fibers there is a collagen fiber net of varying thickness that stains red with van Gieson's stain.

№ 163

Low-differentiated sarcoma

(H.&E. Under low and higher magnification)

Microscopically there are frequently undifferentiated cell structures. Under higher magnification the elongated, parallel cells and their hyperchromatic nuclei are observed. Mitosis is frequent. No interstitial substance (collagen fibers) can be seen between the tumor cells.

№ 152

Cavernous haemangioma of the liver

(H.&E. Under low and higher magnification)

Microscopically there are large vascular spaces lined by flattened endothelial cell layer and filled up with blood.

№ 165

Papilloma of the skin

(H.&E. Under low and higher magnification)

Microscopically under low magnification, there is a caplike growth on the skin surface that consist of basal cell-like cells (hence the marked basophilia) and connective tissue containing blood vessels. It's covered by epithelium.

№ 166

Fibroadenoma of the breast

(H.&E. Under low and higher magnification)

Microscopically there is intracanalicular growth pattern of stromal tissue and slit-like spaces lined by ductal epithelium.

№ 172

Adenocarcinoma of the stomach (Gastric adenocarcinoma)

(H.&E. Under low and higher magnification)

Microscopically there are cells with dark-staining nuclei replacing the mucosa and infiltrating into the deeper layers of the gastric wall.

№ 169

Keratinising type of squamous carcinoma of the skin

(H.&E. Under low and higher magnification)

Microscopically the tumor shows papillary growth pattern and well formed keratin pearl in the whorls of malignant squamous cells.

№ 167

Invasive ductal carcinoma of breast

(H.&E. Under low and higher magnification)

Microscopically the epithelial cells of the malignant tumor are forming ducts and acini.

№ 177

Glioblastoma

(H.&E. Under low and higher magnification)

Microscopically there is tumorous tissue that contains numerous areas of necrosis and hemorrhage. Highly polymorphic cells with a variety of cellular forms predominate. They have bizarre hyperchromatic and polymorphic nuclei that are usually arranged perivascularly. Between these elements, there are small round cells.

№ 154

Arachnoidendothelioma (meningioma)

(H.&E. Under low and higher magnification)

Microscopically there are spindle-shaped cells arranged in onion-skin layers. In the center there are hyaline or calcified spheres (necrotic cells). Between these foci are solid portions of identical, elongated-oval cells, surrounded by collagen fibers.

№ 176

Neurofibroma

(Van-Gieson. Under low and higher magnification)

Microscopically the bundles of nerve fibers (yellow with van-Gieson's stain) are fragmented and separated by proliferating connective tissue (red with van-Gieson's stain). There are densely packed, spindle-shaped cells in wide bundles.

№ 170

Melanoma of the skin

(H.&E. Under low and higher magnification)

Microscopically there are a lot of deposits of melanin in the skin. There are spindle-shaped melanoma cells along the entire epidermal pathway.

№ 219

Liver in chronic myeloid leukaemia

(H.&E. Under low and higher magnification)

Microscopically the sinusoids are dilated and tightly packed with large nucleated blood cells (myelocytes with round vesiculated nuclei and granular cytoplasm; myeloblasts with oval nuclei). The periportal fields are infiltrated only slightly or not at all. The hepatocytes may show evidence of pressure atrophy and of degenerative changes.

№ 221

Liver in chronic lymphocytic leukaemia

(H.&E. Under low and higher magnification)

Microscopically the periportal fields are permeated by the lymphoblasts, lymphocytes; while the sinusoids contain only a limited number of nucleated cells.

№ 134

Lymphatic node in Hodgkin's disease.

(H.&E. Under low and higher magnification)

Microscopically there is heterogeneous cellular infiltrate, which consists of eosinophils, plasmacells and histiocytes. Typical Reed-Sternberg cells are observed too.

EXAMPLES OF MACROSPECIMEN'S DESCRIPTION:

Haemangioma of liver: on a cut section there is round shaped tumor with subserous localization consists of cavities with marked amount of the amount of blood.

Fibroadenoma of the breast gland: there is thick dense node 2.0cm in diameter. On section the tissue of the node white-pink and fibrillar.

Choroid plexus papilloma: In the lateral ventricle of the brain there is a soft tumor which is connected with a vascular plexus and has surface of small papillae.

Glioblastoma: There is a 3×4cm tumor (node) in the white substance of the hemisphere without clear borders, has soft consistence and "motley" color on a cut section (foci of necrosis and haemorrhages).

Red bone marrow in anemia: on a cut section of a tubal bone there is bright-red jucy bone marrow resembles raspberry jelly

TOPIC: ATHEROSCLEROSIS & ISCHEMIC HEART DISEASE

№ 185
Coronary Arteriosclerosis

(Van-Gieson. Under low and higher magnification)

Microscopically, the coronary artery is embedded in subepicardial fat tissue. The loose adventitia provides the external covering. The media appears a red ring. The intima shows a semilunar fibrous thickening and also a lighter-appearing, atheromatous plaque with swelling-induced necrosis.

№ 186
Lipoidosis of the Aorta

(Sudan III. Under low and higher magnification)

Microscopically, the loose adventitia with fat cells and blood vessels (vasa vasorum); in the middle, the media consisting of elastic and smooth muscle fibers is cushiony and fibrous; the intima is thickened. Under the higher magnification Sudan-positive fat deposits are observed in the intima.

№ 184
Fresh cardiac necrosis or myocardial infarction

(H.&E. Under low and higher magnification)

Microscopically, the homogenization of the sarcoplasm, absence of nuclei of the cardiac muscle cells is observed. The nuclei of the interstitial connective tissue are still maintained. Necrotic area is demarcated by leucocytes, lymphocytes and histiocytes.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Myocardial infarction: on the cut section of the left ventricle there is a clay-like dull focus of the myocardium yellowish with reddish rim, size 2.5x4.0cm.

TOPIC: HYPERTENSIVE VASCULAR DISEASE

№ 192
Arteriolosclerotic kidney (shrunken kidney)

(H.&E. Under low and higher magnification)

Microscopically the most prominent feature is the thickened walls of the larger arteries; the elastic-hyperplastic proliferation of the intima. The glomeruli are partially hyalinized and sclerosed, and their tubules are atrophic, with interstitial fibrosis and a loose infiltration with lymphocytes.

№ 189
Encephalomalacia with granular cells

(H.&E. Under low and higher magnification)

Microscopically, there is softening and liquefaction of brain tissue. The nuclei are almost entirely absent, the myelin sheaths are dissolved. Numerous granular cells have been revealed.

№ 197
Cardiosclerosis

(Van-Gieson. Under low magnification)

Microscopically connective tissue growth among cardiomyocytes is observed. Van Gieson's stain shows the red connective tissue. The cardiac cells are atrophy.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Primary-shrunken kidney: the kidney is extremely reduced in size (weight 50.0g); its surface is granular; consistence is dense.

TOPIC: RHEUMATIC DISEASES

№ 181

Recurrent, verrucous, rheumatic endocarditis

(H.&E. Under low and higher magnification)

Microscopically there are thickened mitral valve and a wide layer of an eosinophilic deposit under low magnification. Median magnification shows valvular tissue widened by connective tissue elements with numerous blood vessels. The thrombus consists of eosinophilic substance.

№ 183

Rheumatic myocarditis

(H.&E. Under low and higher magnification)

Microscopically there are "Aschoff-Talalaev's" granulomas (or bodies) in the interstitial tissue of the myocardium. In the center of Aschoff-Talalaev's body there is a focus of fibrinoid necrosis with macrophages with hypertrophic nuclei; epithelial cells located in the fan-like manner then a crown of lymphocytes appears.

№ 27

Periarterial sclerosis (onion-like sclerosis) in the spleen

(H.&E. Under low and higher magnification)

Microscopically connective tissue growth appears surrounding the arteries, which looks like onion.

№ 26

Glomerulonephritis in Lupus erythematosus

(H.&E. Under low and higher magnification)

Microscopically there are hematoxylin bodies, thickening of capillary membrane in the glomeruli with "wire loop" appearance.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Rheumatic verrucous endocarditis: on a cut section of the left ventricle there are thick, dense, almost immovable cusps of the mitral valve with soft dark-red wart-like masses on the surface (thrombotic masses).

TOPIC:DISEASES OF PULMONARY SYSTEM

№ 90

Lobar (crupous pneumonia)

(H.&E. Under low and higher magnification)

Microscopically there is a dense-fibrin net in the alveolar cavities. In this fibrin net the first polymorphonuclear leukocytes appear at this time. The intra-alveolar exudate now contains a few erythrocytes.

№ 89

Bronchopneumonia (lobular pneumonia)

(H.&E. Under low and higher magnification)

Microscopically poorly circumscribed, irregular blue foci are seen in the lung tissue. The alveoli between these foci contain a pink-stainging exudate. There are a lot of polymorphonuclear leucocytes in the intra-alveolar exudate.

№ 202

Carnification of the lung

(Elastica van-Gieson's stain. H.&E. Under low and higher magnification)

Microscopically the fibrinous exudate is resorbed by granulation tissue that originates from the respiratory bronchioles and the alveoli. High magnification shows young (yellow) and older (red) collagen fibers with intercolated angioblasts, newly formed capillaries, fibroblasts and histiocytes.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Lung abscess: on a cut section of the lung there is a thick-wall cavity, 4cm in diameter, filled with thick creamy liquid yellowish-greenish masses.

Croupous pneumonia (gray hepatisation stage): lung is enlarged, dense and heavy, with grayish-whitish plaques on the pleura; on a cut section lung parenchyma is grey, airless, resembles tissue of a liver.

TOPIC: DISEASES OF ALIMENTARY SYSTEM

№ 206

Erosion of the gastric mucosa

(H.&E. Under low and higher magnification)

Microscopically there is superficial defect of the gastric mucosa. The cytoplasm of the necrotic glandular cells stains darker with eosin. The cells in the necrotic area have no nuclei. The necrosis is demarcated by a narrow band of granulocytes. Necrosis does not reach to the submucosal leyer. Hydrochloride hematin is in the necrotic area.

№ 207

Chronic gastric ulcer

(H.&E. Under low and higher magnification)

Microscopically low magnification shows an ulcer that extends to the muscular layer. At the base of the ulcer there is a bright gray-red zone – eosinophilic layer of fibrinoid necrosis; then polymorphonuclear leukocytes occur, and granulation tissue develops. In the granulation tissue the capillaries can be seen ascending vertically to the surface. In the lower third are fibroblasts, lymphocytes, histiocytes and fiber formation.

№ 208

Acute phlegmonous appendicitis

(H.&E. Under low and higher magnification)

Microscopically several primary defects with mucosal necrosis and deposition of fibrin and granulocytes can be seen. Noteworthy is the marked widening of the submucosa and the infiltration with granulocytes. The peritoneum is covered with fibrin. The inflammation in the mesentery of appendix.

№ 209

Carcinoid of the appendix

(H.&E. Under low and higher magnification)

Microscopically, low magnification shows the diffuse infiltration into the appendix. Under higher magnification the isomorphic tumor cells arranged into individual clumps, can seen. Mitoses are rare.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Acute phlegmonous appendicitis: Appendix is enlarged; serous coat is dull, grayish, and plethoric with fibrin plaques on a surface; its mesentery is swollen, hyperemic. On the cut section the wall of the appendix is thick; there is pus in the lumen of the appendix.

TOPIC: DISEASES OF THE LIVER

№ 213

Toxic degeneration of the liver – stage of yellow degeneration

(H.&E. Under low and median, higher magnification)

Microscopically under low magnification, irregular, map-like, pale-pink foci are seen. Median magnification shows a homogenous red area: liver cells and sinusoids cannot be distinguished from each other. The nuclei are absent. The cytoplasm of the liver cells is homogenous and has lost its structure.

№ 212

Biliary cirrhosis

(H.&E. Under low and median, higher magnification)

Microscopically under median magnification pseudolobuli and connective tissue septa can be seen that are in contact with the periportal fields. Thus parenchymal areas of varying size are connected with the central veins being randomly located. The connective tissue is infiltrated by cells (lymphocytes, histiocytes), and shows a proliferation of bile ducts.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Toxic degeneration of the liver. Stage of yellow degeneration: liver is enlarged, dense (flabby) not much, bright yellow on a cut section.

Stage of red degeneration: liver is reduced in size, flabby, capsule is shrunken; on a cut section parenchyma is grey, clay-like.

TOPIC: DISEASES OF THE URINARY TRACT

№ 197

Acute exudative glomerulonephritis

(H.&E. Under low and higher magnification)

Microscopically there are enlarged glomeruli. The loops are completely filling the entire capsular space. The capsular spaces and tubules contain leukocytes, erythrocytes. The tubular epithelial cells are enlarged and demonstrate cloudy swelling.

№ 193

Mezangiocapillary glomerulonephritis (intracapillary)

(H.&E. Under low and higher magnification)

Microscopically there is an enlarged glomerulus, cells in mesangial area is dilated, mesangial cells are numerous and enlarged. The parietal leyer of the capsule is unchanged. The basement membrane is very prominent.

№ 194

Intra- and extracapillary proliferative glomerulonephritis

(H.&E. Under low and higher magnification)

Microscopically the glomeruli are cellular, the epithelial cells of the parietal layers of the capsule are enlarged and more numerous with formation of crescent-shaped intrusions. The glomerular loops are compressed by the proliferating of endothelial and mesangial cells.

№ 37

Kidney amyloidosis

(H.&E. Under low and higher magnification)

Microscopically, the homogenous, "hyaline" glomeruli of the cortex are observed. The wall of the arterioles is seen homogenous and red. The pathologic protein appears as a narrow red band in the basement membrane.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Acute glomerulonephritis (big "motley" kidney)**:** kidney is enlarged; pyramids are dark-red; cortex is grayish-brownish with small red dots on the surface and on the cut section.

TOPIC:DISEASES OF ENDOCRINE GLANDS

№ 40

Colloid goiter

(H.&E. Under low and higher magnification)

Microscopically, under low magnification, there are colloid nodules surrounded by a connective tissue. Capsule consiss of follicles of varying sized. The lumen of follicles is filled with colloid. Under high magnification a cushion-like proliferation of the follicles can be seen.

№ 214

Atrophy and lipomatosis of pancreas in diabetes mellitus

(H.&E. Under low and higher magnification)

Microscopically, even low magnification shows a layer of islets with atrophy and sclerotic changes. There are a lot of giant islets too. Under higher magnification lipomatosis and atrophy of β-cells are observed.

№ 191

Glomerulosclerosis in diabetes mellitus

(H.&E. Under low and higher magnification)

Microscopically, under low magnification, the prominent feature is the thickened wall of the longer arteries. There is elastic-hyperplastic proliferation of the intima of arteries. The glomeruli are parietally hyalinized and sclerotised. In the tubules there are atrophy and interstitial fibrosis of loops infiltratited with lymphocytes.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Pancreas in diabetes mellitus: pancreas is reduced in size; parenchyma is partially replaced by fat and connective tissue

TOPIC: DISEASES OF GENITALIA AND PREGNANCY

№ 226

Endocervicosis

(H.&E. Under low and higher magnification)

Microscopically there is an area of cervical mucosa, where cylindrical epithelium is replaced gradually by squamous epithelium. A fully developed squamous overgrowth of pseudoerosion shows a multilayered, non-squamous epithelium on the surface, covering the cervical glands.

№ 229

Abortion

(H.&E. Under low and higher magnification)

Microscopically the curetted material shows secretory or involuting uterine endometrium, a decidual form of cytogenic stroma, fibrinoid necrosis and placental villi.

№ 228

Tubal ectopic pregnancy

(H.&E. Under low and higher magnification)

Microscopically there are placental villi, decidual cells and fibrinoid necrosis in the tubal wall with erosion of the sub-mucosal blood vessels and bleeding into the tubal lumen.

№ 227

Chorionepitelioma

(H.&E. Under low and higher magnification)

Microscopically there is myometrium infiltration, consisted of a large mass of cells. There are polymorph, multinucleated giant cells and smaller groups of cuboid cells, necrotic areas and fibrin deposits. Invasion of blood vessels is observed (it is of diagnostic importance).

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Adenoma of the prostate gland: prostate gland's consistence is dense-elastic, its surface is tuberous, size is enlarged, especially its medium lobe which juts out into the lumen of the urinary bladder. On a cut section parenchyma has nodules and whitish-yellowish porous foci and whitish fibers of the connective tissue.

TOPIC: PRE-PERINATHAL PATHOLOGY

№ 15

Hyaline membrane disease due to prematurity and lack of surfactant production from immature lung

(H.&E. Under low and higher magnification)

Microscopically there are thick pink membranes lining the alveolar spaces

№ 100

Meconium aspiration

(H.&E. Under low and higher magnification)

Microscopically small rounded balls of meconium are seen in an alveolus, along with flattened "squames" or desquamated fetal skin cells that are found in the amniotic fluid.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

External cephalohematoma: parietal bone of the fetus with accumulation of the blood under the periosteum 1 cm thick.

TOPIC: INFECTIONS

№ 230

Cerebriform swelling of Peyer's patch in typhoid fever

(H.&E. Under low and higher magnification)

Microscopically a superficial mucous membrane defect and incipient necrosis are observed. Under high magnification lots of macrophages have been revealed. Their cytoplasm contains pyknotic nuclei, nuclear fragments, erythrocytes, and bacteria in the phagosomes (so called typhoid cells).

№ 231

Hyperplasia of lymph node in typhoid fever

(H.&E. Under low and higher magnification)

Microscopically enlargement of the lymphoid follicles, which are distended by a diffuse invasion of swollen macrophages and lymphocytes has revealed.

№ 232

Diphtheritic-ulcerative colitis in dysentery

(H.&E. Under low and higher magnification)

Microscopically, ulcerations are found that extend to the muscularis propria, with islands of normal mucosal remnants. The mucosal islands show polypoid proliferation.

№ 205

Large variegated grippe lung (serous-desqumative pneumonia)

(H.&E. Under low and higher magnification)

Microscopically the alveoli are filled with serous exudation with alveolar macrophages, desquamation of alveolocytes, erythrocytes and leucocytes. Interalveolar septas are thickened due to proliferation of lymphocytes.

№ 88

Bronchopneumonia (viral-bacterial)

(H.&E. Under low and higher magnification)

Microscopically poorly circumscribed, irregular blue foci are seen in the lung tissue. The alveoli between these foci contain a pink-stainging exudate. Under high magnification it can be seen that the alveoli are tightly packed with polymorphonuclear leukocytes.

№ 94

Diphtheria of larynx

(H.&E. Under low and higher magnification)

Microscopically mucous membrane of larynx is plethoric, covered with dense, bright-pink fibrinous membranes.

№ 91

Peribronchial, focal pneumonia in measles

(H.&E. Under low and higher magnification)

Microscopically small, blue-stained foci with a small bronchus in the middle are seen. The lumen of the bronchus is filled with granulocytes, and the wall is heavily infiltrated by polymorphonuclear leukocytes. The interstitial tissue of the alveoli are involved in the inflammatory process, thus there are leukocytic infiltration with multinucleated giant cells.

№ 201

Healed primary tuberculous focus

(Van-Gieson's stain. Under low and higher magnification)

Microscopically there is primary tuberculous focus in the lung, consisting of focus of necrosis with calcification, cellular infiltration. There are epithelioid cells, lymphocytes, and multinucleated Langhan's giant cells in this infiltration.

№ 93

Embolic apostematous nephritis

(H.&E. Under low and higher magnification)

Microscopically there is fibrinoid swelling and necrosis of individual glomerular loops. There are granular casts, erythrocytes, polymorphonuclear leukocytes in the capsular space and in the tubules. Under low magnification there are numerous scattered cellular foci in the cortex.

№ 182

Polypous-ulcerous endocarditis

(H.&E. Under low and higher magnification)

Microscopically a large thrombus, consisting of fibrin and platelets and containing masses of blue-stained bacteria, is attached to the top of the valvular tissue. The calcification of connective tissue at the base of the valve is an indication. There is cellular infiltration, consisting mainly of leukocytes.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Diphtheritic colitis in dysentery: On a cut section of large intestine there is hyperemic and edematous mucous membrane, its surface is covered with grey-green films.

Large variegated grippe lung: lung is enlarged and motley on a cut section.

Crupous laringotracheobronchitis in diphtheria: Mucous membrane of the larynx, trachea and bronchi is thick, swollen, dull, covered with easily removing whitish-grayish plaques; some of plaques in the form of casts are in the lumen of respiratory tract.

Gohn's focus: in the III segment of the upper lope of the right lung there is rounded focus 2.5cm in diameter filled with yellowish dry crumbly mass resembling cottage cheese.

Septic spleen: the spleen is enlarged, flabby; the pulp on a cut section is cherish with an abundant scrape.

TOPIC: DENTAL PATHOLOGY

№ 60

Medium caries

(H.&E. Under low magnification)

Microscopically there is destruction of the enamel, dentinal junction as well as most of the dentine. Dentinal channels are dilated and filled with microbes.

№ 91

Acute purulent pulpitis

(H.&E. Under low magnification)

Microscopically there is acute inflammatory process with dilated plethoric vessels and diffuse leukocytic infiltration of the pulp.

№ 92

Granulation periodontitis

(H.&E. Under low magnification)

Microscopically there is granulation tissue infiltrated by neutropholic leukocytes.

№ 157

Ameloblastoma

(H.&E. Under low magnification)

Microscopically formation consists of rounded cells forming cords and alveoli of epithelial cells which are located in the connective tissue base.

№ 158

Angiomatous epulis

(H.&E. Under low magnification)

Microscopically there are numerous vessels of venous and capillary type in the connective tissue base. Surface of the formation is covered by multilayered squamous epithelium.

№ 159

Giant-cell epulis

(H.&E. Under low magnification)

Microscopically there are numerous giant multinucleated cells (osteoclasts) and small mononucleated cells with rounded nuclei (osteoblasts). These cells are located in the connective tissue base. Surface of the formation is covered by multilayered squamous epithelium.

EXAMPLE OF MACROSPECIMEN'S DESCRIPTION:

Medium caries: The molar with central defect of the chewing surface in the form of wedge-shape cavity, which base is directed to the surface of the tooth. Enamel and dentin junction are destroyed; dentine is the floor of the cavity.

Fibrous epulis: there is tumor-like formation on the vestibular surface of the incisor's gum. The formation has dense consistence, mushroom shape, 1 cm in diameter, attached to the supraalveolar tissues.

Навчальне видання.

Методичні вказівки для самостійної роботи студентів медичних вузів з англійською мовою навчання на практичних заняттях з патоморфології

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