

**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ**  
**Харківський національний медичний університет**

## **NEOPLASIA**

***Manual for practical classes in pathomorphology  
for English-speaking medical students***

## **ПУХЛИНИ**

***Методичні вказівки до занять з патоморфології  
для студентів медичних вузів  
з англійською мовою навчання***

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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 used both for home and individual work 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. Determining the primary level of the knowledge – 5 min.
2. Independent work of the students – 50 min.
3. Determining the final level of the knowledge – 20 min.
4. Checking the protocols of the practical class and attestation of the students – 15 min.

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

## References:

1. Патоморфологія : нац. підручник / В.Д. Марковський, В.О. Туманський, І.В. Сорокіна та ін. ; за ред. В.Д. Марковського, В.О. Туманського. – Київ : ВСВ «Медицина», 2015. – 936 с.
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## Lesson

### Subject: Mesenchymal tumours

**Validation of the subject:** Benign and malignant tumours are frequent pathological conditions. Mesenchymal tumours from connective, vascular, muscular, lipid, bony, cartilage tissues, synovial capsules, fasciae, tendons, aponeuroses occur frequently, and malignant variants of them very often cause death. In children, benign tumours of the skin (angioma, nevus) comparatively

rare, malignant tumours are more common. Among malignant tumours, sarcoma prevails, cancer develops more rarely.

**Objectives of the lesson:** to study tumour, types of tumour growth, morphogenesis, histogenesis, differential characteristics of tumours, the degree of maturity and differentiation, terminology and classification of tumours. To learn the classification of mesenchymal tumours, give the morphological characteristic, the ways of dissemination, possible outcomes and significance for the organism.

### Visual aids

*Annotated tables:*

- histological classification of tumours;
- definitive distinctions of mature and immature tumours;
- tumours from mesenchyma.

*Slides:*

- fibromyoma of the uterus;
- cavernous haemangioma of the liver;
- low-differentiated fibrosarcoma.

*Macrospecimens:*

- fibroma of the skin;
- fibromyoma of the uterus;
- lipoma;
- chondroma;
- sarcoma: of the forearm, foot, femur;
- haemangioma of the liver;
- lymphangioma;
- haemangioendothelioma of the liver.

*Microspecimens:*

- # 151 – fibromyoma of the uterus;
- # 163 – low-differentiated fibrosarcoma;
- # 152 – cavernous haemangioma of the liver.

*Electronograms:*

- fibrosarcoma;
- rhabdomyosarcoma;
- osteosarcoma.

### Questions to control basic knowledge:

1. Does fibroma occur in the skin?
2. Name the tumours of fibrous tissue:  

A. Fibroma.	D. Hybernoma.
B. Dermatofibroma.	E. Leiomyoma.
C. Lipoma.	

3. Designate the most frequent localisation of desmoid:  
A. Uterus. B. Breast. C. Abdominal wall. D. Myocardium. E. Liver.
  4. Name the malignant tumour from bony tissue:  
A. Chondrosarcoma. D. Liposarcoma.  
B. Osteosarcoma. E. Leiomyosarcoma.  
C. Fibrosarcoma.
  5. What tumours of blood vessels are: 1 – benign and 2 – malignant:  
A. Capillary haemangioma. D. Venous haemangioma.  
B. Haemangioendothelioma. E. Benign haemangiopericytoma.  
C. Haemangiopericytoma. F. Glomus tumour.
- Answers 1 – yes; 2 – a, b; 3 – c; 4 – b; 5. 1) a, d, e, f, 2) b, c.

### **Stages of individual work in class**

#### **Study and describe macrospecimen:**

*Fibroma of the skin.* Characterize the outlook of the tumour, its connection with the skin, name the most frequent localisations, enumerate the types of fibroma according to the density.

*Fibromyoma of the uterus.* Describe the outlook of the tumour, its color, presence of a capsule, enumerate the types of fibromyoma of the uterus according to the layer of the last one, possible complications, malignant analogue.

*Lipoma.* The outlook of the tumour, its color, consistency, localisation, name the malignant analogue of lipoma.

*Cavernous haemangioma of the liver.* Describe the outlook of the tumour, its color, borders, the content of the cavities, type of the tumour.

*Sarcoma of the femur, forearm, foot.* Name the organ, describe the tumour, its attitude to the surrounding tissue, the ways of dissemination.

#### **Study, draw and describe the microspecimens**

# 151 – *fibromyoma of uterus* (stained according to Van-Gieson). Describe if the tumour has a capsule, pay attention to the atypical tissue, disorders in collocation of picryophil and fuxinophil fibres of different thickness. Depict the specimen.

# 163 – *low-differentiated sarcoma* (stained with hematoxylin and eosin). Determine the structure of the tumour, the sizes and shape of its cells, variety of mitoses and cellular atypism. Draw the specimen.

# 152 – *cavernous haemangioma of the liver* (stained with hematoxylin and eosin). Determine the organ, describe the state of the cavities of the tumour, the attitude of the tumour to the tissue of the liver, the size of the cavities, their bed and content. Draw the specimen.

#### **Study the electronograms:**

*Fibrosarcoma.* Pay attention to the tumour cells containing elongated nuclei with irregular distribution of chromatin.

*Rhabdomyosarcoma.* Find binuclear cell from myofibril bundles going in different directions.

*Osteosarcoma.* The tumour cells have a big indented nucleus with marginal location of chromatin and well-pronounced nucleoli. A thin rim of cytoplasm surround the nucleus. On the peripheral part of cell there are masses of osteoid tissues.

### **Krok questions:**

1. On examination of a 6-year-old child with a tumour on the femoral diaphysis, several metastatic foci of another osseous localization were found. A histological examination of the primary tumour revealed that it consisted of some round cells, which had scanty cytoplasm, were characterized by an insignificant tendency to formation of pseudorosettes, and manifested themselves with solitary mitoses. What is your diagnosis?

- A. *Plasmacytoma.*      C. *Ewing's sarcoma.\**      E. *Fibrosarcoma.*  
B. *Chondroma.*      D. *Osteosarcoma.*

2. A newborn baby has some red-blue flattened tumor, 5×4×0.3 cm in size, in a capsule on the skin of its face. Microscopically, the tumour consists of large thin-walled vascular cavities which have an endothelial lining and are filled with blood. Name the tumour.

- A. *Venous haemangioma.*      D. *Haemangiopericytoma.*  
B. *Cavernous haemangioma.\**      E. *Lymphangioma.*  
C. *Capillary haemangioma.*

3. A clinical study is performed with patients who had a diagnosis of breast cancer. Characteristics of the grade, stage, molecular biology, and histologic type are analyzed. Of the following characteristics, which is most likely to be associated with the best prognosis for these patients?

- A. *Decreased nuclear/cytoplasmic ratio.\**      D. *Decreased apoptosis.*  
B. *Increased expression of laminin receptors.*      E. *Decreased doubling time.*  
C. *Increased cathepsin expression.*

### **Questions to control the knowledge:**

1. Name the malignant tumour from connective tissue; ways of its dissemination.
2. Enumerate benign and malignant tumours of fibrous, lipid and muscular tissues.
3. Name benign and malignant tumours from blood and lymphatic vessels.
4. Benign and malignant tumours from synovial capsules, mesothelium and bone tissue.
5. Enumerate secondary changes in tumours.
6. Negative influence of tumours on the organism.

## Terminology

Blastoma, oncology, unicentric and multicentric growth, tissue and cellular atypism, sex chromatin, anaplasia, invasive, expansive, endophytic and exophytic growth, metastasis, relapse, choristia, hamartia, progonoma, teratoma, fibroma, lipoma, hibernoma, leiomyoma, rhabdomyoma, haemangioma, haemangiopericytoma, glomus-angioma, lymphangioma, synovioma, osteoma, osteoblastoma, chondroma, chondroblastoma, haemangioendothelioma, sarcoma.

## Practical habits and skills

Having studied macro- and microspecimens pertaining to the subject "Mesenchymal tumours", the students are to be able to differentiate benign tumours (derivatives of mesenchyma) from malignant ones; to know the main ways of dissemination of sarcomas.

### Revise the word-building elements:

onco – tumour  
carcino – cancer  
sarco - flesh  
leiomyo – smooth muscle  
rhabdomyo – striated muscle  
lipo – fat  
osteo – bone  
-plasia – formation, growth (process)  
-plasm – formation  
-oid – resembling  
-oma – tumour  
ana – up, backward, again  
meta – change, beyond, near

## Lesson

### Subject: Tumours from melanin-creating tissue, nervous system and brain meninges

**Validation of the subject:** the knowledge of the above tumours is necessary to understand oncologic diseases at clinical departments. In medical practice it is necessary for comparison of clinical data with the findings of biopsies and operative material and also for clinicoanatomical analysis of section materials.

**Objective of the lesson:** to study how to distinguish different types of tumours from nervous system and melanin-creating tissue.

### Visual aids

*Annotated tables:*

- classification of tumours of central and peripheral nervous systems;
- tumours of autonomic nervous system.

*Coloured tables:*

- nevus and melanoma (macro- and microstructure);
- neurinoma;
- neurofibromatosis (Recklinghausen's disease);
- arachnoidendothelioma.

*Slides:*

- neurofibroma;
- arachnoidendothelioma (meningeoma);
- melanoma;
- glioblastoma.

*Macrospecimens:*

- glioblastoma;
- ependioma;
- medulloblastoma;
- neurinoma;
- neurofibromatosis;
- arachnoidendothelioma;
- melanoma;
- metastases of melanoma to the liver and bones.

*Microspecimens:*

- # 176 – neurofibroma;
- # 154 – arachnoidendothelioma (meningeoma);
- # 177 – glioblastoma;
- # 170 – melanoma of the skin.

**Questions to control basic knowledge:**

1. Are melanocytes the cells of neurogenic origin?
2. What localisations among enumerated are the most characteristic for nevi:  
A. *Face.*                      B. *Neck.*                      C. *Trunk.*                      D. *Extremities.*
3. Histologically there are 3 variants of astrocytomas:  
A. *Fibrillar.*                      C. *Protoplasmatic.*                      E. *Tubular-trabecular.*  
B. *Tubular.*                      D. *Trabecular.*                      F. *Fibrillar-protoplasmatic.*
4. Chose correctly build histogenetic chains of tumours of nervous system:  
A. *Astrocyte-astrocytoma-astroblastoma.*  
B. *Medulloblast-ependymoma-medulloblastoma.*  
C. *Ependymocyte-ependymoma-ependymblastoma.*  
D. *Angioblast-ganglioneuroma-malignant paraganglioma.*  
E. *Lemmocyte-neurilemmoma-malignant neurilemmoma.*
5. Tumours of autonomous nervous system are:  
A. *Ganglioneuroma.*                      D. *Neurofibromatosis.*                      G. *Sympathogonioma.*  
B. *Meningeoma.*                      E. *Glomus tumour.*  
C. *Hemodectoma.*                      F. *Ependymoma.*

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

## Stages of individual work in class

### Study and describe macrospecimen:

*Glioblastoma*. Pay attention to the presence of tumour tissue in the cerebral one, the outlines of its margins, its colour. Explain its varied appearance.

*Ependymoma*. Describe the tumour localisation, characterise its growth to the surrounding tissues, the colour of the tumour on dissection, its consistency. The significance of the tumour for the organism. Name of the tumour in the case of malignancy.

*Medulloblastoma*. Determine the localisation of the tumour, describe the growth to the surrounding tissues, the relief of its margins, its colour on dissection, consistency. Name the ways of intracranial metastases.

*Neurofibromatosis*. Describe the size, shape and localisation of the tumour nodes, the consistency, the outlook of the tumour, the degree of skin pigmentation. Give the surname of the scientist who described neurofibromatosis.

*Arachnoidendothelioma* – Describe its localisation, outlook, consistency, changes in the surrounding cerebral tissues, the margins of tumour node.

*Skin melanoma and its metastases (into the liver and bones)*. Describe the colour, surface, type of growth to the surrounding tissues. Pay attention to the uneven colouring of the tumour nodes in the liver and vertebrae. What are the possible non-skin localisations of primary melanoma nodes?

### Study, draw and describe the microspecimens

# 177 – *glioblastoma* (stained with hematoxylin and eosin). At low magnification find the tumour in the cerebral tissue. At high one investigate the tumour composition: pay attention to the cellular polymorphism, the size and quantity of the nuclei, numerous vessels in the tumour, the presence of secondary changes. The histogenetic type of the tumour, maturity of the cells, growth speed, frequency of intracranial metastases.

# 154 – *arachnoidendothelioma* (stained with hematoxylin and eosin). Pay attention to elongated cells, organised in concentric structures. Name histogenesis, maturity degree of cellular components of the tumour. Give the names of specific corpuscles, which are characteristic for the tumour. Name the malignant variant.

# 176 – *neurofibroma* (stained with picrofuxine according to Van-Gieson). Pay attention to the shape of the cells, arrangement of conglomerates of the tumour cells which are organised into typical structures. The most frequent tumour localisation.

# 170 – *melanoma of the skin* (stained with hematoxylin and eosin). Pay attention to the domination of parenchyma over stroma; cell polymorphism, presence of granules of black-brown pigment in the cytoplasm. Name the formation which preceded the formation of melanoma.

### Krok questions:

1. A 45-year-old male underwent surgical removal of a tumour, 4×3 cm in size, from the lateral ventricle of his brain; the tumour surface had small papillae, and it was connected with a vascular plexus. Microscopically, the tumour consisted of villus-like vegetations covered with epithelial cells of the cubical and columnar shape and the monomorphous kind. Which of the tumours listed below was the most probable?

- A. *Ependymoma*.                      C. *Choriopapilloma*.\*                      E. *Glioblastoma*.  
B. *Ependymoblastoma*.                      D. *Choriocarcinoma*.

2. A 40-year-old male patient underwent removal of a tumour, 2 cm in diameter, which was localized in the region of the cerebellopontine angle of the brain stem and tended to grow into the auditory meatus. Histologically, the tumour consisted of spindle cells with rod-shaped nuclei; the tumour cells and fibres formed rhythmic structures. Name the kind of the tumour.

- A. *Medulloblastoma*.                      C. *Schwannoma*.\*                      E. *Astrocytoma*.  
B. *Meningioma*.                      D. *Oligodendroglioma*.

3. A male underwent surgical removal of a black tumour, 2 cm in diameter, from the skin of his thigh. Microscopically, the tumour consisted of polymorphous cells, the cytoplasm of most of them having some brown pigment (with a positive reaction to DOPA). A large number of pathological mitoses was registered. Which of the tumours listed below was the most probable?

- A. *Carcinoma*.                      C. *Carcinosarcoma*.                      E. *Nevus*.  
B. *Sarcoma*.                      D. *Melanoma*.\*

### Questions to control the knowledge:

1. Why are all tumours of central nervous system considered to be malignant?
2. Give the classification of tumours of nervous system.
3. Enumerate benign and malignant tumours of melanin-creating tissue.
4. Why do melanaemia and melaninuria occur in melanoma?

### Terminology

Astrocytoma, astroblastoma, oligodendroglioma, oligodendroglioblastoma, ependymoma, ependymoblastoma, chorioid papilloma, chorioidcarcinoma, glioblastoma, ganglioneuroblastoma, medulloblastoma, arachnoid-endothelioma, neurilemmoma, nevus, melanoma.

### Practical habits and skills

On the basis of the obtained knowledge the students are to be able to diagnose tumours from melanin-creating and nervous tissues and also to perform clinico-anatomical analysis of section material.

## Revise the word-building elements:

astro – astrocytes  
cyto – cell  
blasto – immature cell  
glio – glue, neuroglial tissue  
ependymo – ependyma  
papillo – nipple-like, finger-like  
neuro – nervous system, nerves  
medullo – middle, soft  
arachoido – arachnoid membrane  
melano – black  
oligo – scanty  
-oma – tumour  
– blast – immature cell

## Lesson

### Subject: Epithelial tumours

**Validation of the subject:** the number of persons with malignant neoplasm increases throughout the world that is why the questions of diagnosis and treatment of these diseases have great importance for all medical specialities. It is necessary to know the tumours from squamous multilayered or glandular epithelium (organ non-specific and organ-specific, which develop from the cells of certain organs) for understanding oncology problems. The correct assessment of biopsy results by the anatomist can help the physician to choose the correct treatment of the patient, as well as to define the prognosis of the tumour process.

**Objective of the lesson:** to study the difference between benign tumours from epithelium and malignant ones, to investigate the classification of tumours from epithelium, give the characteristics of organ-specific tumours of endo- and exocrine glands (hypophysis, epinephrons, uterus, pancreas etc.), ways of their dissemination, possible outcomes, significance of tumours from epithelium for the organism.

### Visual aids

*Annotated tables:*

- classification of the epithelial tumours;
- scheme of dissemination of primary cancer;
- tumours of epithelial origin – benign: a) papilloma of the urinary bladder, b) adenoma of the kidney;
- tumours of epithelial origin – malignant: a) medullar cancer, b) cancer of the lower lip, c) fungoid cancer of the stomach.

*Slides:*

- papilloma of the skin;
- squamous-cell keratinising cancer of the skin;
- solid breast cancer;
- adenocarcinoma of the stomach.

*Macrospecimens:*

- papilloma of the skin;
- papilloma of the urinary bladder;
- adenoma of the ovary;
- papillary cyst of the ovary;
- polyposis of the stomach;
- polyposis of the colon;
- mucous cancer of the stomach;
- scirrhous of the stomach;
- fibroadenoma of the mammary gland;
- cancer of the uterus.

*Microspecimens:*

- # 165 – papilloma of the skin;
- # 166 – fibroadenoma of the mammary gland;
- # 172 – adenocarcinoma of the stomach.

*Electronograms:*

- ultrastructure of the cancer cell;
- adenocarcinoma of the stomach.

### **Stages of individual work in class**

#### **Study and describe macrospecimens:**

*Papilloma of the skin.* Describe the outlook of the tumour, its connection with the skin, the most frequent localisation, outcomes of papilloma, name the malignant type.

*Polyposis of the stomach and colon.* The outlook of the tumour: size, colour, surface, quantity of tumours, malignant variant.

*Papilloma of the urinary bladder.* Types of the tumour at the side of the mucous membrane, possible complications, malignant variant.

*Cystoadenoma of the ovary.* Describe the surface of the tumour, the thickness of the wall, the character of the content, possible complications.

*Cancer of the mammary gland.* The tumour outlook: size, colour, localisation; name microscopic type of the tumour; name pre-cancer states.

*Gastric cancer.* Describe the outlook of the tumour, name the macroscopic form of it, its localisation, ways of dissemination. What pre-cancer conditions do you know?

*Cancer of the uterine body.* Localisation of the tumour, its colour, size; the character of growth, possible complications; enumerate the most frequent

metastases. Name pre-cancers of uterine cervix and body. Pay attention to: cancer of the liver (primary and metastatic), cancer of the kidneys and thyroid glands the most difficult for diagnosis.

**Study, draw and describe the microspecimens**

# 165 – *papilloma of the skin* (stained with hematoxylin and eosin).

Name the tissue from which the tumour has developed, describe the papillary growths covered by thickened multilayer squamous epithelium keratinised all over the surface. Pay attention to the correct localisation of epithelium layers and presence of basal membrane, type of morphologic atypism, name malignant variants of papilloma.

# 166 – *fibroadenoma of the mammary gland* (stained with hematoxylin and eosin). Find gland-like canals and connective tissue stroma of the tumour. Pay attention to the state of stroma constricting the gland lumen and surrounding them like thimbles.

# 172 – *adenocarcinoma of the stomach* (stained with hematoxylin and eosin). Describe atypical epithelial glandular formation of the stroma, pay attention to the attitude of atypical glands to the wall of the stomach and name the type of morphologic atypism, histological variants of adenocarcinoma.

**Study the electronograms:** *adenocarcinoma of the stomach* – gland of the mucous membrane of the fundus. In the cytoplasm of the main cells there are many secretory granules. Cytomembrane of the crists has numerous villi.

**Krok questions:**

1. A histological examination of a scrape from the mucous coat of the uterus made in a female patient, who complained of a disorder in the ovariomenstrual cycle, revealed vegetation of the glandular structures consisting of atypical epithelial cells with hyperchromatic nuclei and pathological mitoses. The changes in the glandular structures were accompanied by an impairment in the integrity of the basal membrane of the cells. Make a diagnosis.

- A. *Adenocarcinoma.\**
- B. *Glandular hyperplasia of endometrium.*
- C. *Chorionepithelioma.*
- D. *Mucinous carcinoma.*
- E. *Dimorphic carcinoma.*

2. A microscopic examination of a biopsy from a uterine cervix revealed some neoplasm consisting of the stratified squamous epithelium characterized by cellular and nuclear atypism, pathological mitoses, as well as keratin pearls in the depth of the epithelial layers. What is your diagnosis?

- A. *Transitional cell carcinoma.*
- B. *Nonkeratinizing squamous cell carcinoma.*
- C. *Keratinizing squamous cell carcinoma.\**
- D. *Adenocarcinoma.*
- E. *Solid carcinoma.*

3. A microscopic examination of a biopsy from a deformed mucous membrane of a lobar bronchus of a 45-year-old male, who smoked for many years, revealed a carcinoma consisting of atypical epithelial cells with hyperchromatic nuclei

and numerous pathological mitoses. The growth of the tumour did not spread to the basal membrane of the epithelium. Name the histological form of carcinoma.

A. *Squamous cell carcinoma.*

D. *Solid carcinoma.*

B. *Adenocarcinoma.*

E. *Small-cell carcinoma.*

C. *Carcinoma in situ.\**

### **Questions to control the knowledge:**

1. Name benign and malignant tumours from epithelium.
2. The most frequent histological types of adenoma.
3. What is the most frequent way of cancer dissemination?
4. What histologic types of cancer may develop in the liver, kidneys, mammary gland, uterus, ovary, thyroid gland?
5. Name secondary changes in tumours.

### **Terminology**

Papilloma, cancer, squamous-cell cancer with- and without keratinization. Adenoma: acinar, tubular, trabecular, papillary, fibroadenoma. Adenomatous polyp. Cancer: mucous, solid, fibrous, small-cell, medullar. Adenocarcinoma. "Cancer pearls". "Cancer in situ".

### **Practical habits and skills**

Having studied the material the students are to be able to recognise the tumours and differentiate them on the basis of main clinico-morphological features.

### **Revise the word-building elements:**

- a – absence
- meta – beyond
- carcino – cancer
- onco – tumour
- papillo – finger-like, nipple-like
- kerato – horn
- adeno – gland
- fibro – fibers, fibrous tissue
- medullo – soft
- scirrho – hard
- polypo – growth, usually on stalks
- oma – tumour

## **Lesson**

### **Subject: Cancer of stomach, lung, breast**

**Validation of the subject:** the material is a theoretical base for studying oncology at clinical departments. Studying of this type of pathology is also necessary for clinical interpretation of histologic study of operational, biopsy and autopsy materials.



4. Name pre-cancer diseases of the breast:

A. *Acute mastitis.*

C. *Chronic mastitis.*

B. *Benign dysplasias of the mammary gland.* D. *Papilloma of the ducts.*

5. Name the ways of metastasis growth in cancer of the stomach: 1 – lymphogenic, 2 – haematogenic:

A. *Regional lymphatic nodes of the lesser and larger curvatures.*

B. *Liver.*

C. *Supraclavicular lymph nodes.*

D. *Pararectal lymph nodes.*

E. *Lungs.*

F. *Ovary.*

G. *Pancreas.*

H. *Bones.*

I. *Kidneys.*

J. *Epinephrons.*

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

### Stages of individual work in class

#### Study and describe macrospecimens:

*Polyposis of the stomach.* Characterise the state of gastric mucosa: outlook, presence of tumour-like formations (localisation, quantity, size, elasticity, the character of the surface, connection with the mucous membrane). Evaluate the pathology.

*Fungiform cancer of the stomach.* Characterise the outlook of the tumour (localisation, size, shape, consistency, surface, its attitude to the stomach cavity, involvement of the wall). What can precede cancer of the stomach? What are possible causes of death?

*Saucer-shaped cancer of the stomach.* Describe the tumour of the stomach (localisation, size, shape, consistency, central part of the tumour). Point what type of the tumour growth dominates. Can it occur due to chronic gastric ulcer and by what histologic forms can this tumour be represented?

*Diffuse cancer of the stomach.* Characterise tumour invasion of the stomach wall (spread and localisation of the tumour, density and flexibility of the wall) and the mucous membrane (relief, surface, state of rugae). What form of cancer develops most frequently?

*"Krukenberg's" cancer of ovaries.* Describe the tumour of the stomach. Characterise the tumour invasion (multiple lesion of the both ovaries, size, tumour nodes). At what primary localisation of basic focus may the tumour occur, what are the ways of metastasis?

*Central cancer of the lung.* Define general microscopic changes in the bronchial wall in cancer of the lung (localisation and dissemination of the tu-

mour, its attitude to the bronchi, growth). What changes developed in the adjacent lung tissue and pleura? The attitude of the tumour to the organs of the mediastinum, possible histological variants.

*Peripheral cancer of the lung.* What is the difference between this tumour and central cancer of the lung (localisation, size, shape, attitude to the pleura, state of the surrounding lung tissue).

*Fibroadenoma and nodular cancer of breast.* Give the differential diagnosis of benign and malignant tumour of the mammary gland (localisation, dissemination, consistency, the boundary between it and gland tissue, flexibility of the tumour and its attitude to the skin).

### **Study, draw and describe the microspecimens**

# 172 – *adenocarcinoma of the stomach* (stained with hematoxylin and eosin). At low magnification define dissemination of the tumour process in the stomach wall, pay attention to the presence of tumour complexes in all the layers of the wall and its invasion of all layers of the stomach wall down the serous membrane. High magnification allows to find adenogeneity of the tumour, marked atypism of epithelium cells with hyperchromatosis of the nuclei and formation of glandular structures of different size and shape, which grow into the surrounding tissues (adenocarcinoma).

# 169 – *Squamous-cell keratinising cancer of the lung* (stained with hematoxylin and eosin). At low magnification study the walls of the bronchi and adjacent zone of the lung tissue, paying attention to complexes of atypical squamous epithelium. At high magnification define atypical, polymorphic epithelium and the presence of concentric clusters of keratinised substance – "cancer pearls".

# 176 – *solid breast cancer* (stained with hematoxylin and eosin). At low magnification find and study accretion of epithelium in the ducts and lobules of the gland with abundance of tumour out of their abutments. At high magnification pay attention to infiltrating (invading) growth of tumour with destruction of epithelium basal membrane and abundance of cellular infiltration in the peridural tissue.

### **Krok questions:**

1. A bronchoscopy of the mucous membrane of the main bronchus revealed some tumour. A microscopic examination of the tumour biopsy showed that it consisted of lymphocyte-like cells with hyperchromatic nuclei growing in the form of layers or bands and involving the submucous layer. The tumour had many pathological mitoses. Which of the histological forms of carcinoma listed below was the most probable?

A. *Squamous cell carcinoma.*

B. *Small-cell carcinoma.\**

C. *Adenocarcinoma.*

D. *Adenoacanthoma.*

E. *Scirrhous carcinoma.*

2. An autopsy of a female who died from cachexia, revealed some massive exophytic carcinoma on the lesser curvature of the stomach with metastases to the ovaries. What kind of metastatic spreading took place?

A. *Haematogenous.*

D. *Implantation.*

B. *Lymphogenous orthograde.*

E. *Perineural.*

C. *Lymphogenous retrograde.\**

3. A 39-year-old woman has noted red, scaling area on her breast for 3 months. On physical examination there is an eczematous 1 cm diameter area on the skin of the right breast areola. There is no palpable lump in this breast. Biopsy of the skin lesion is performed and on microscopic examination shows large cells at the dermal-epidermal junction that stain positively for mucin. Which of the following is the most likely diagnosis?

A. *Paget disease of breast.\**

D. *Dermatophyte infection.*

B. *Nipple discharge.*

E. *Inflammatory carcinoma.*

C. *Intraductal carcinoma.*

### Questions to control the knowledge:

1. Pre-cancer diseases of the stomach.
2. Cancer of the stomach: aetiology, morphogenesis, histogenesis, clinico-anatomical classification, characteristics of macroscopic forms and histological types, peculiarity of growth and metastasis, complications and causes of death.
3. Pre-cancer processes in the lungs.
4. Cancer of the lungs: aetiology and pathogenesis, clinicoanatomical classification, characteristics of macroscopic forms and histological types, peculiarities of growth and metastases, complications and causes of death.
5. Pre-cancer processes in the mammary gland.
6. Breast cancer: clinicoanatomical classification, characteristics of macroscopic forms and histologic types, peculiarities of growth and metastasis, complications and causes of death.

### Terminology

Pre-cancer diseases and processes; background or profile of cancerous stomach; epithelial dysplasia; exophytic expansive growth; endophytic infiltrative growth; exoendophytic, mixed growth; plaque cancer, polypous cancer, fungoid cancer; ulcerated cancer; ulcer-cancer; infiltrative-ulcerative cancer; diffuse cancer; early (minor) stomach cancer; Virchow's, Schnitzler's, Krukenberg's metastases; carcinomatosis of the peritoneum; peritumorous inflammation; bronchogenic and pneumogenic cancer of the lung; core (central) cancer; peripheral cancer, mixed (massive) cancer; benign dysplasia of the mammary gland and papilloma of ducts; nodular cancer; diffuse cancer, cancer in cuirass; Peget's cancer.

### **Practical habits and skills**

On the basis of the studied macro- and microspecimen, the students are to be able to diagnose different forms of cancer (stomach, lungs and mammary gland) on biopsy and surgical material as well as to perform clinicoanatomical analysis of the autopsy material.

### **Revise the word-building elements:**

carcino – cancer  
phyto – to grow  
endo – inside  
dys – bad  
pre – before  
exo – outside  
-ous – pertaining to  
-oid – resembling  
-plasia – development

*Навчальне видання*

## **ПУХЛИНИ**

### **Методичні вказівки до занять з патоморфології для студентів медичних вузів з англійською мовою навчання**

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# **NEOPLASIA**

***Manual for practical classes in pathomorphology  
for English-speaking medical students***