

***Place and role of the pathology in
the medicine.***

***Structure of pathology and
methods of investigation***

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(Just for educational purposes)

Without pathology there is no modern diagnostics!

Law: „all surgically removed tissue must be sent to pathology!“

routine: 8 % formalin

other studies: 0,9 % NaCl

never should be dry!

Except:

- tooth**
- normal placenta**
- nail**
- eye lens**

PARTS OF THE PATHOLOGY

Autopsy:

- **obligatory in Hungary**
- **autopsy report - must be archived**
- **clinician must be present**

Histopathology:

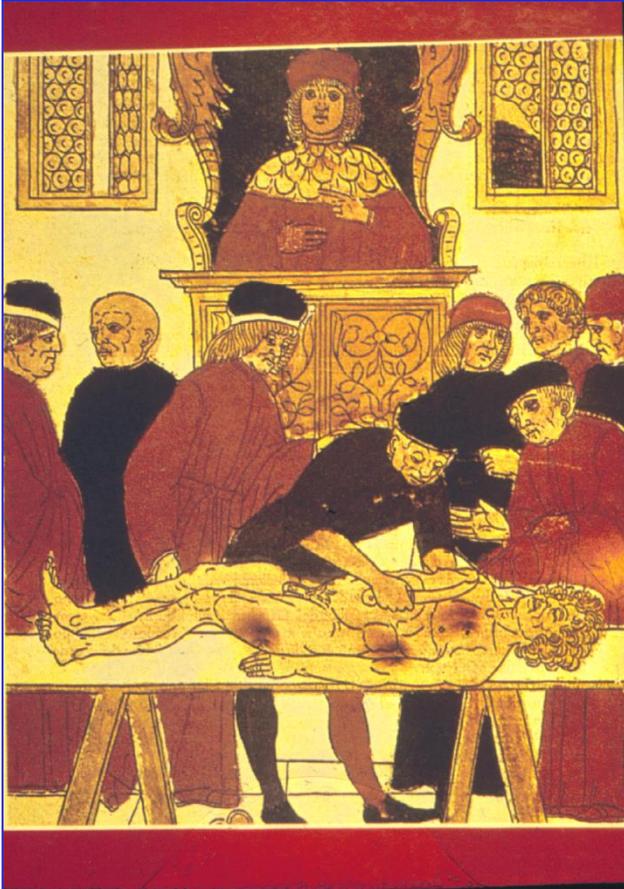
- **it determines the therapeutic strategy**
(gold standard)
- **resection, excision, core biopsy**
- **intraoperative frozen section**
- **histopathological report - must be archived**

Cytology:

- **exfoliative cytology (e.g. fluids)**
- **abrasive cytology (cervix, bronchus, stomach)**
- **fine needle aspiration cytology (FNAB, FNAC, ABC)**

Molecular pathology:

Autopsy



- controls the clinical diagnoses (quality control)
- provides epidemiological data
- characterization of newly discovered diseases
- better understanding of the natural history of malignant diseases
- recognition of the morphological alterations (medical teaching)
- exclusion of forensic cases
- defense against the malpractice charges

Histopathology

Determines the treatment strategies!



abscess forming inflammation → antibacterial treatment

tbc → specific antituberculous treatment

metastasis → search for primary neoplasm

→ removal of the whole organ

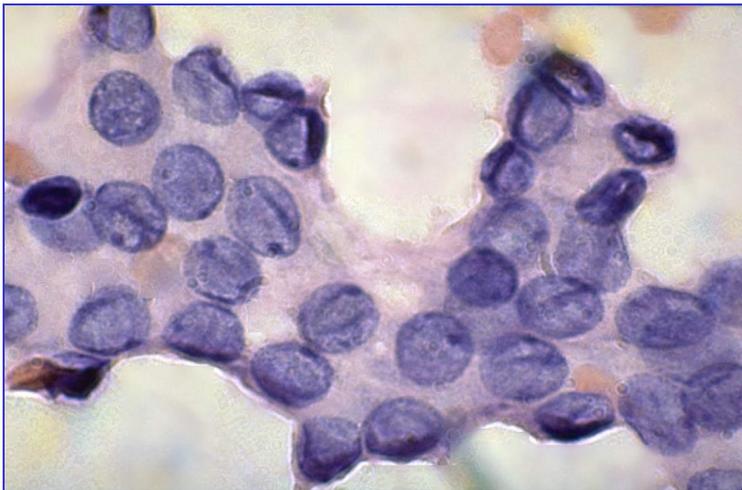
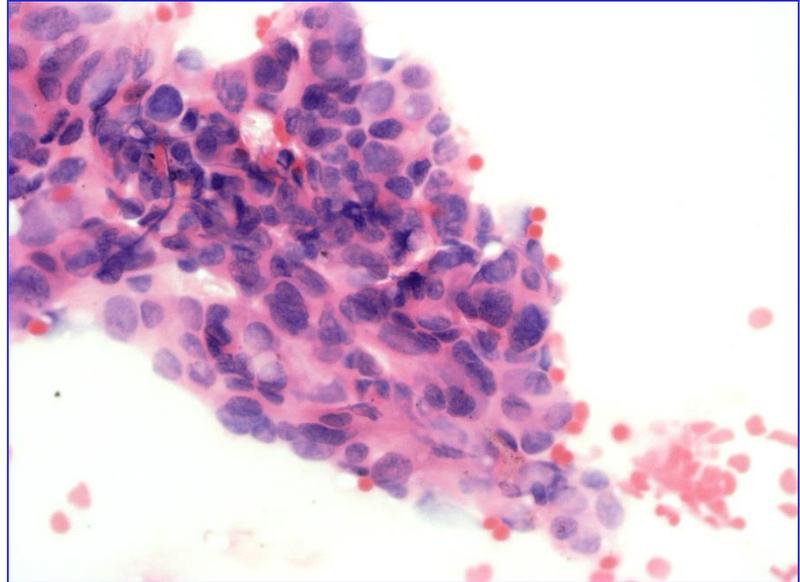
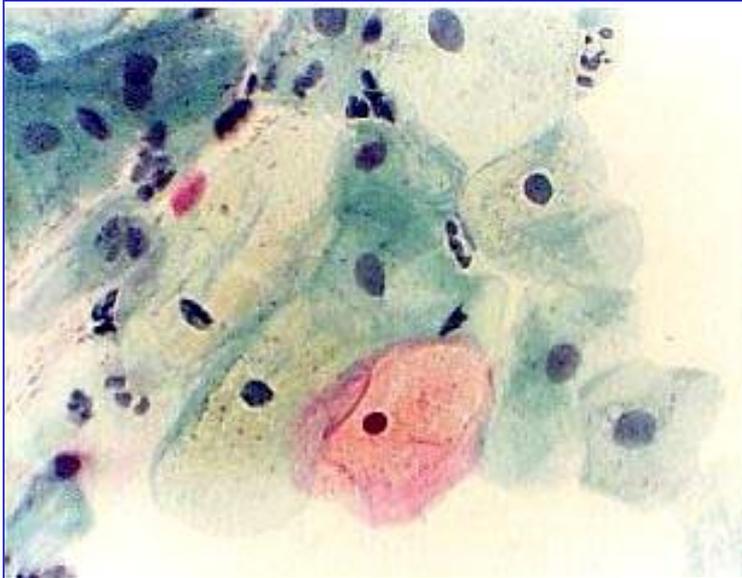
→ decides the extent of operation

→ staging of the malignant tumors

primary malignant lymph node tumor

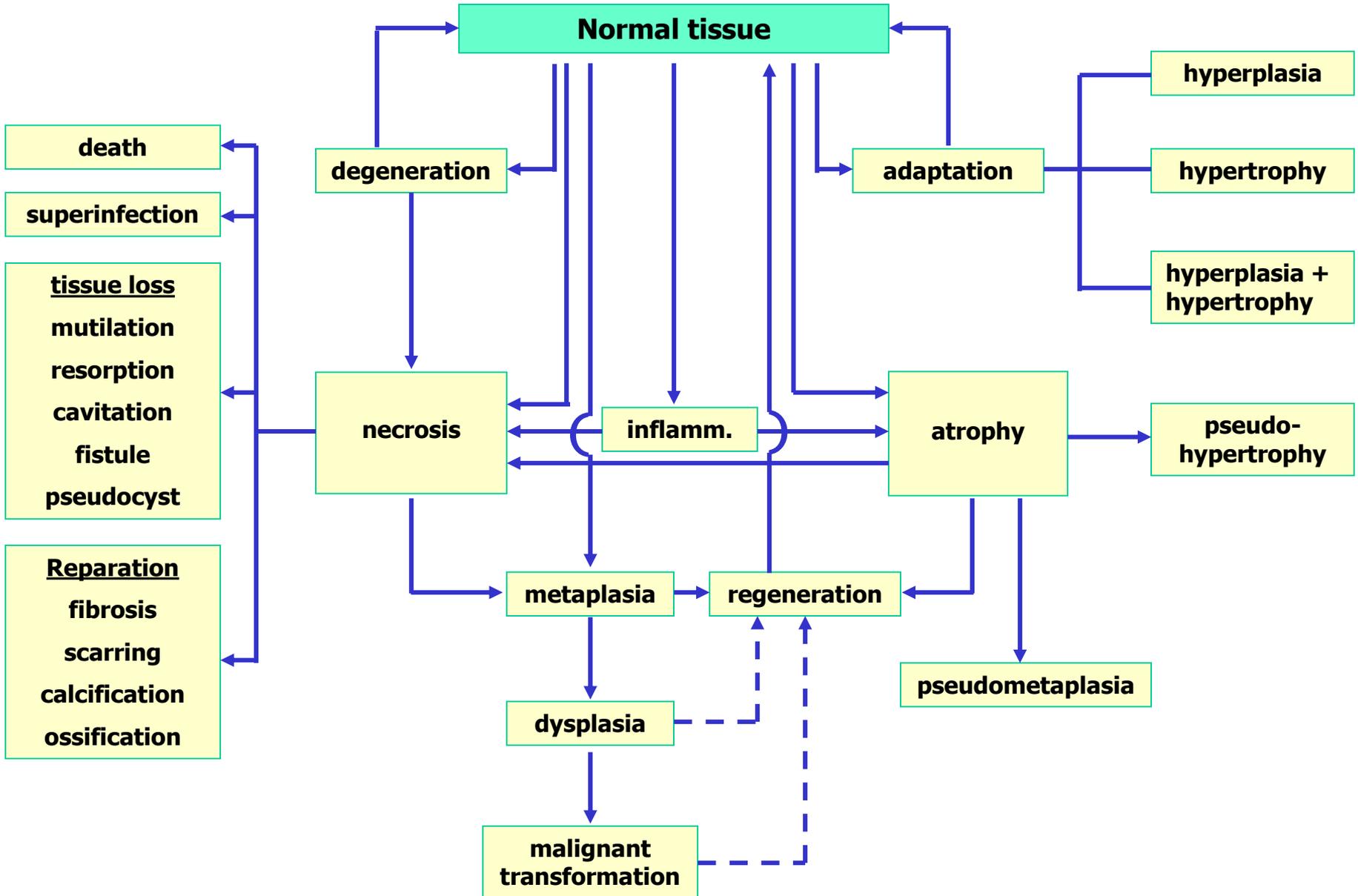
→ chemotherapy

Cytology



- characterization of the effusions
- screening for preneoplastic conditions
- recognition of the nature of focal lesions
(breast, thyroid, liver, salivary gland, brain...)

Abnormal noxas



Degenerations (dystrophies)

Results of metabolic cellular damage, morphological appearances of the intracellular disturbances

Many different causes – nonspecific!

- **tissue hypoxia, shift in pH**
- **intracellular ionic imbalance**
- **toxic damage**
- **distant effect of severe generalized inflammations**
- **burn, freezing**
- **intoxications**

- **Parenchymatous degeneration (cloudy swelling)**
- **Hydropic degeneration**
- **Vacuolic degeneration**
- **Fatty degeneration**

Parenchymatous degeneration (cloudy swelling)

Impaired intracellular oxidation



Inefficient K/Na-pump



Increased membrane permeability



Increased intracellular water content

**Parenchymatous organs (heart, liver,
kidney)**

Swollen, wet, pale brown, friable

Granular cytoplams

(swollen organelles)

Kidney: dilated stellate veins

Tubular lumens: virtual, narrow

Hydropic and vacuolic degeneration

More severe cellular damage

Cytoplasmic water accumulation

Hypertonic solutions

Intoxications (coolant; ethyleneglycol)

Hypokalemic conditions

(e.g. Conn-syndrome)

Fatty degeneration

Accumulation of neutral lipids (triglycerides) in the cytoplasm

Depending on the size of lipid droplets: microvesicular – macrovesicular

Increased triglyceride-synthesis

- hyperlipidemias
- increased fatty acid synthesis
- decreased fatty acid oxidation
(hypoxia, acidosis)

Impaired triglyceride-excretion

- impaired protein synthesis
- alcoholism
(disturbed membrane transport)
- shortage of lipotropic materials

Characteristic localizations: LIVER, heart (diffuse, or „tiger heart“), kidney

Glycogen storage

- Genetic disorders resulted from enzyme deficiency or defect (gene mutations)
- Autosomal recessive (rarely: sex-linked) inheritance
 - manifested in homozygotics, heterozygotics are carriers –
- Manifested mainly in neonatal period or in childhood

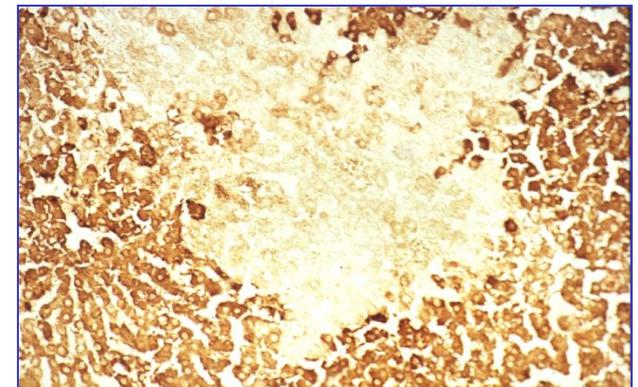
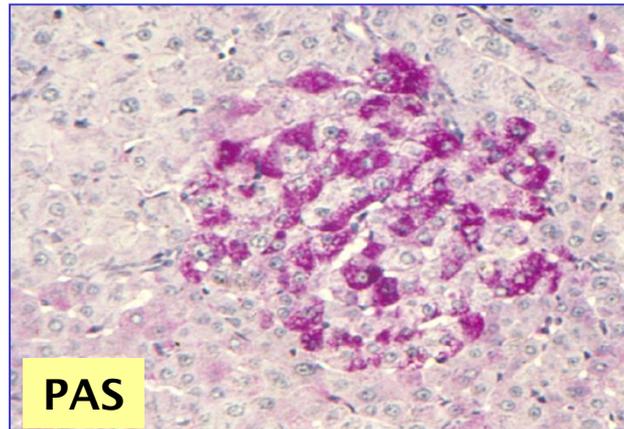
I. (von) Gierke's disease (hepatorenal glycogenosis)

II. II. Pompe disease

III. III. Cori disease

IV. Andersen disease

V. McArdle disease

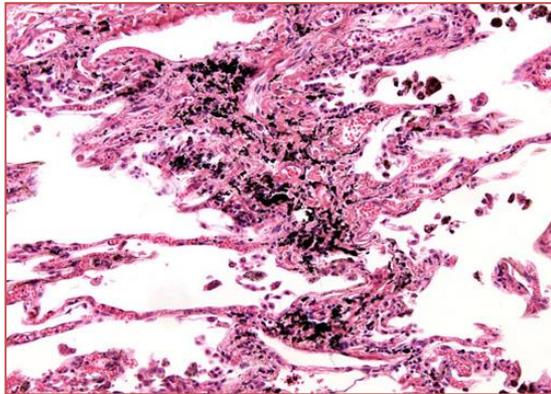


Pigments

Exogeneous

Coal dust (anthracosis)

Tattoo (incl. amalgam-tattoo)



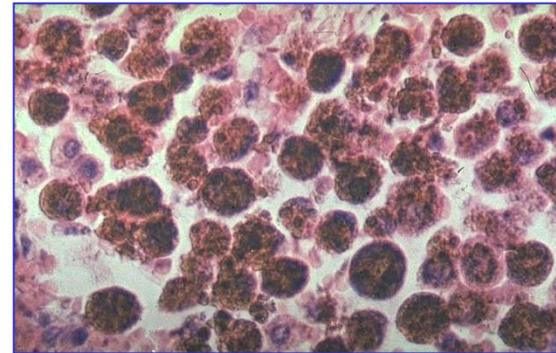
Endogeneous

Lipofuscin

Hemosiderin

Melanin

Bilirubin (jaundice, icterus)



Nevus forms

1. Intraepidermal (junctional) -
2. Intradermal -
3. Compound -
4. Blue -
5. Spitz (spindle cell) -
6. Congenital giant -
7. Dysplastic nevus syndrome

