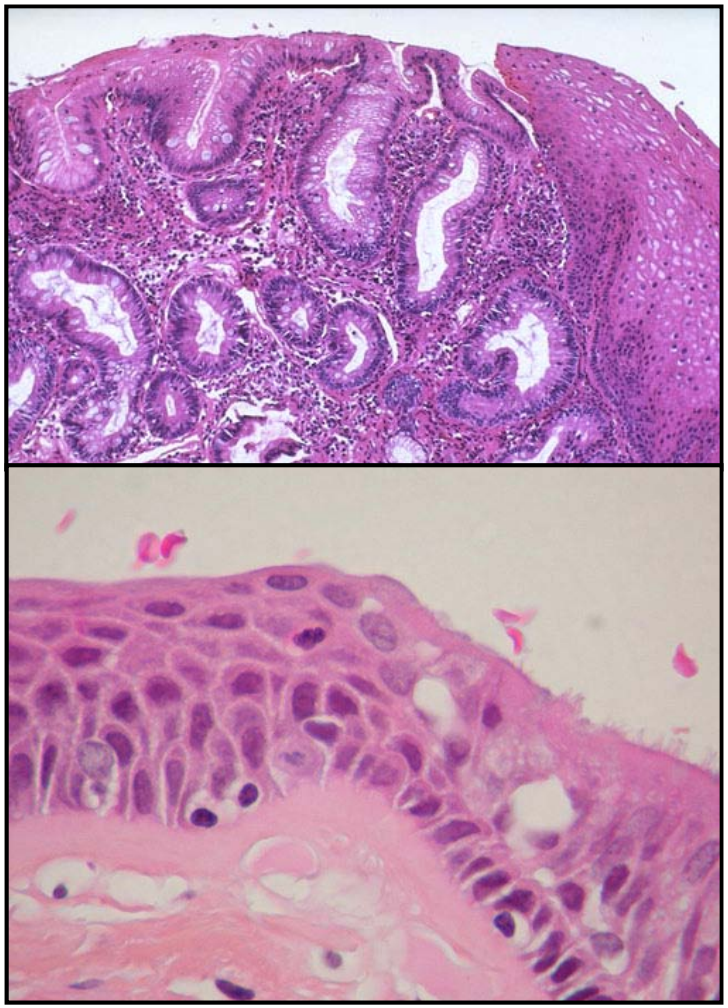
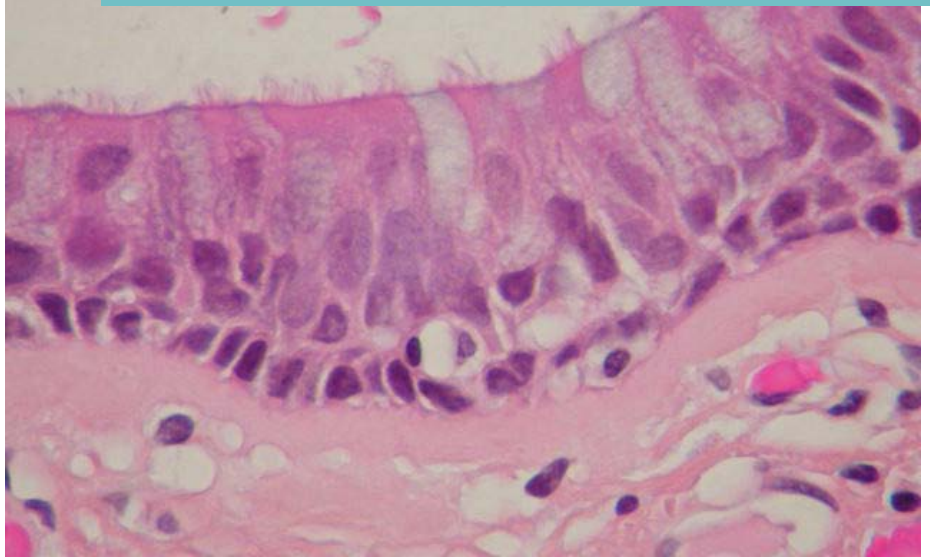
Metaplasia

A **mature** tissue type replaced by an **other** tissue type, usually because of some kind of irritation.

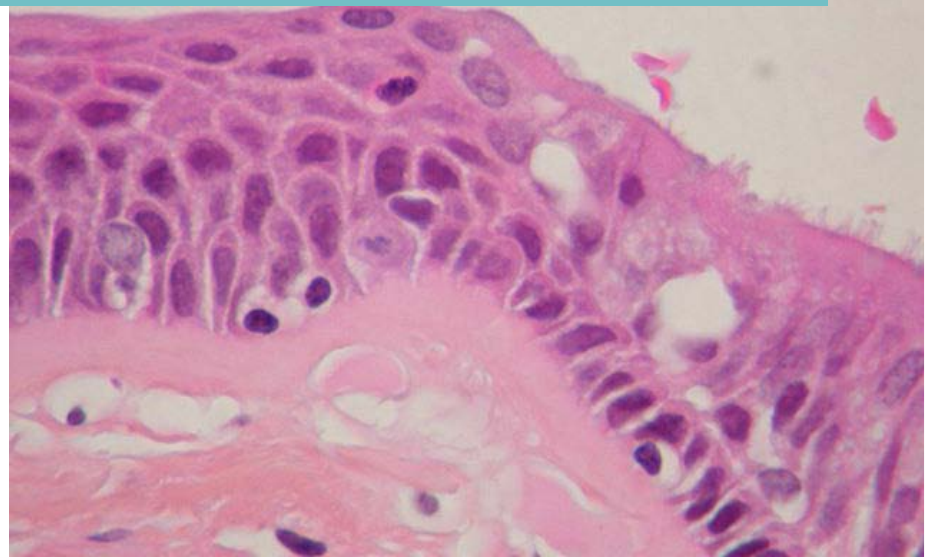
On the basis of metaplasia dysplasia, then malignant tumor **may** develop, but it is **not obligatory**.



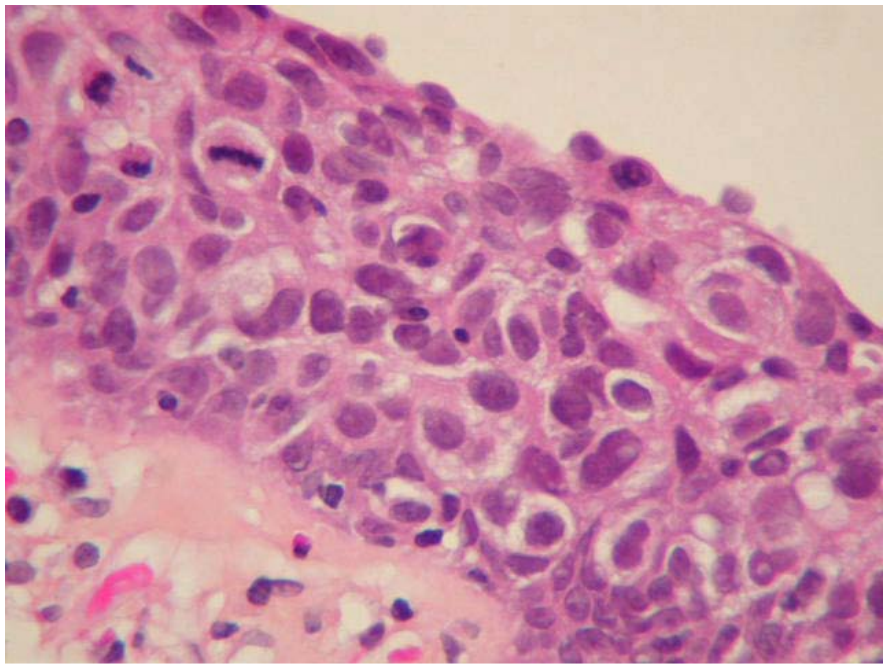
Metaplasia - precancerous



normal bronchial epithelium



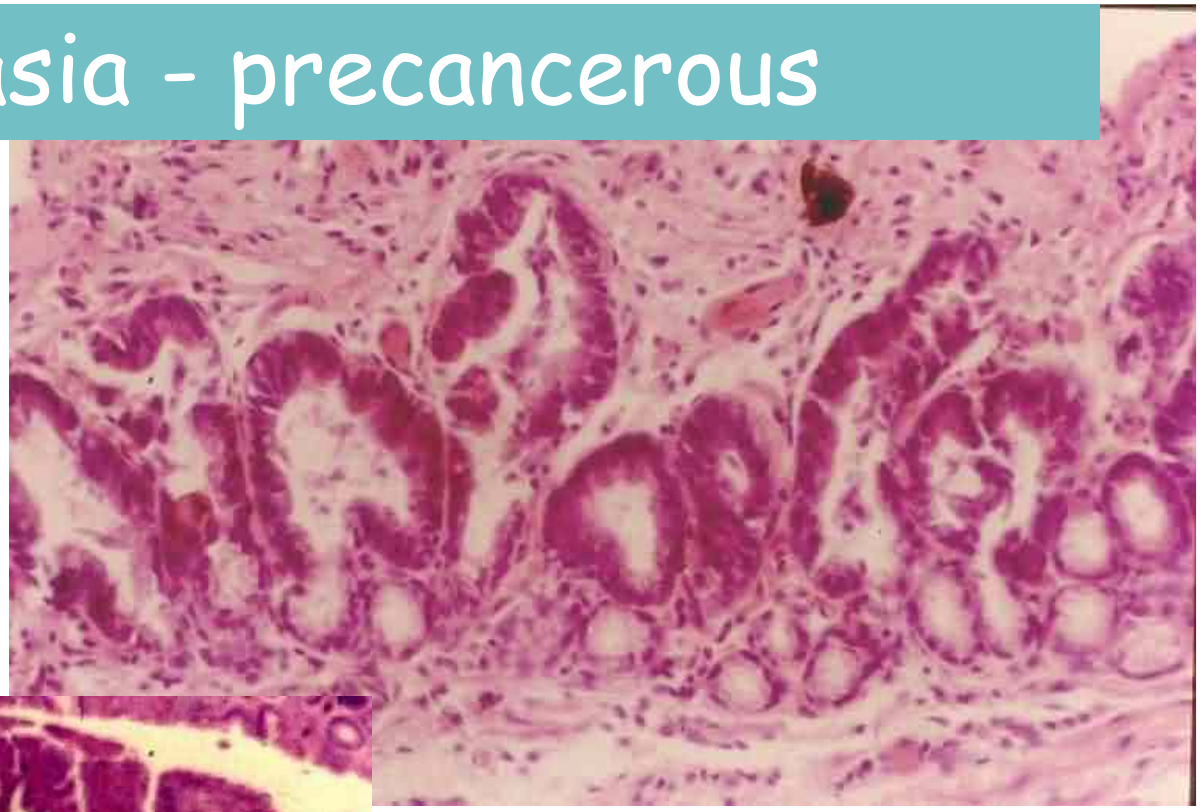
metaplasia

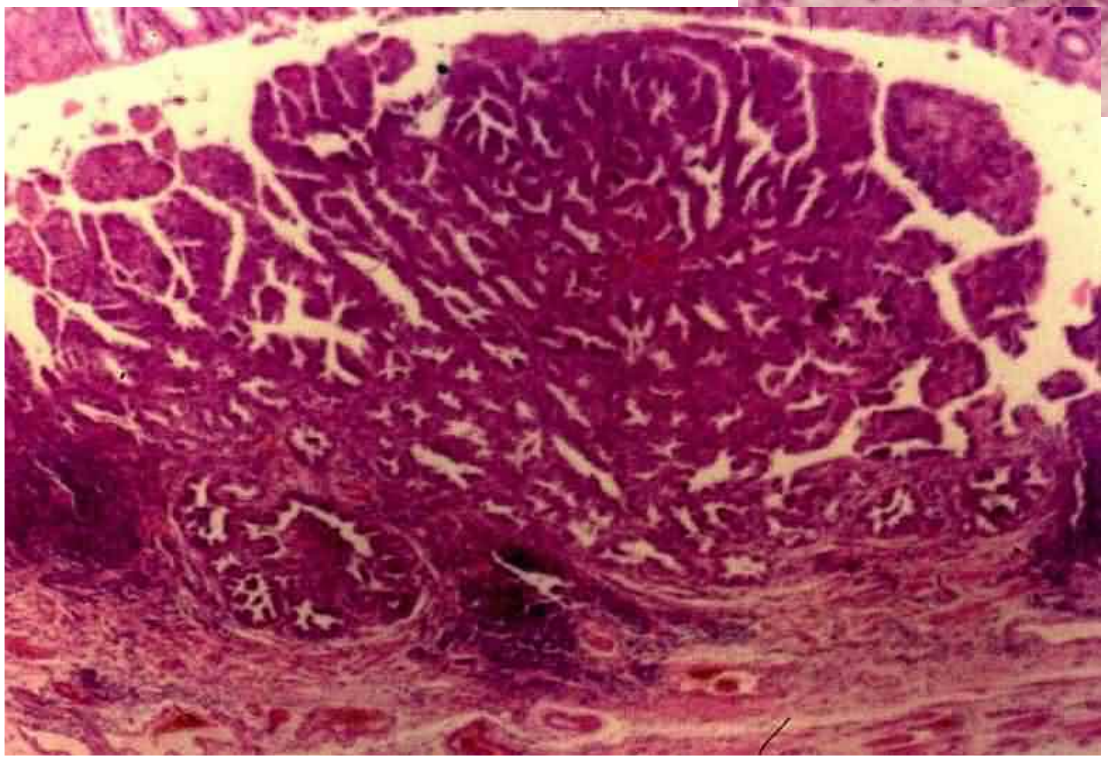


cc. in situ

Metaplasia - precancerous

Barrett-dysplasia

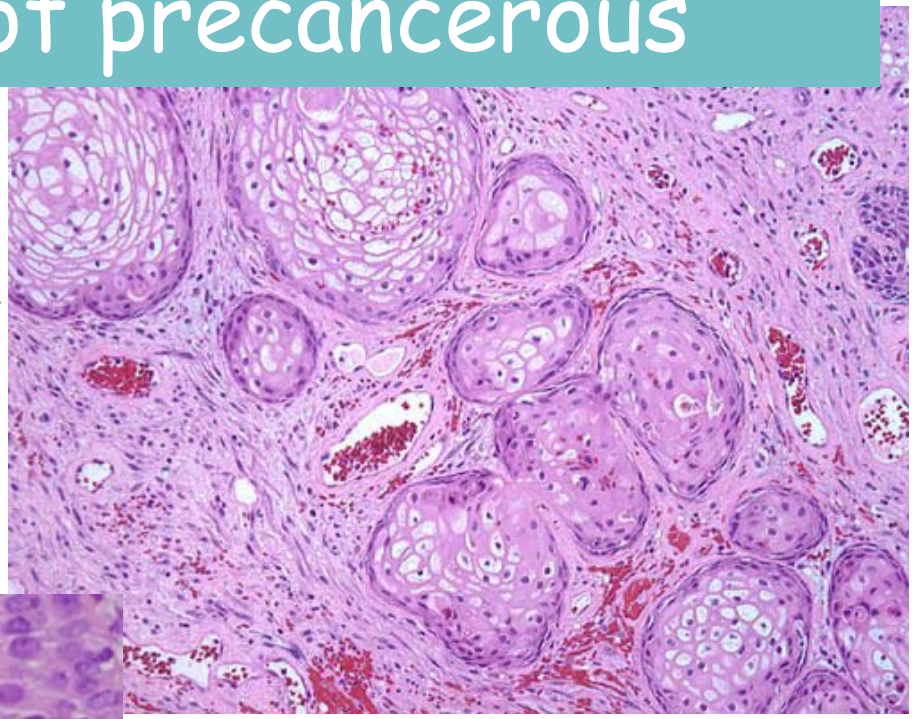


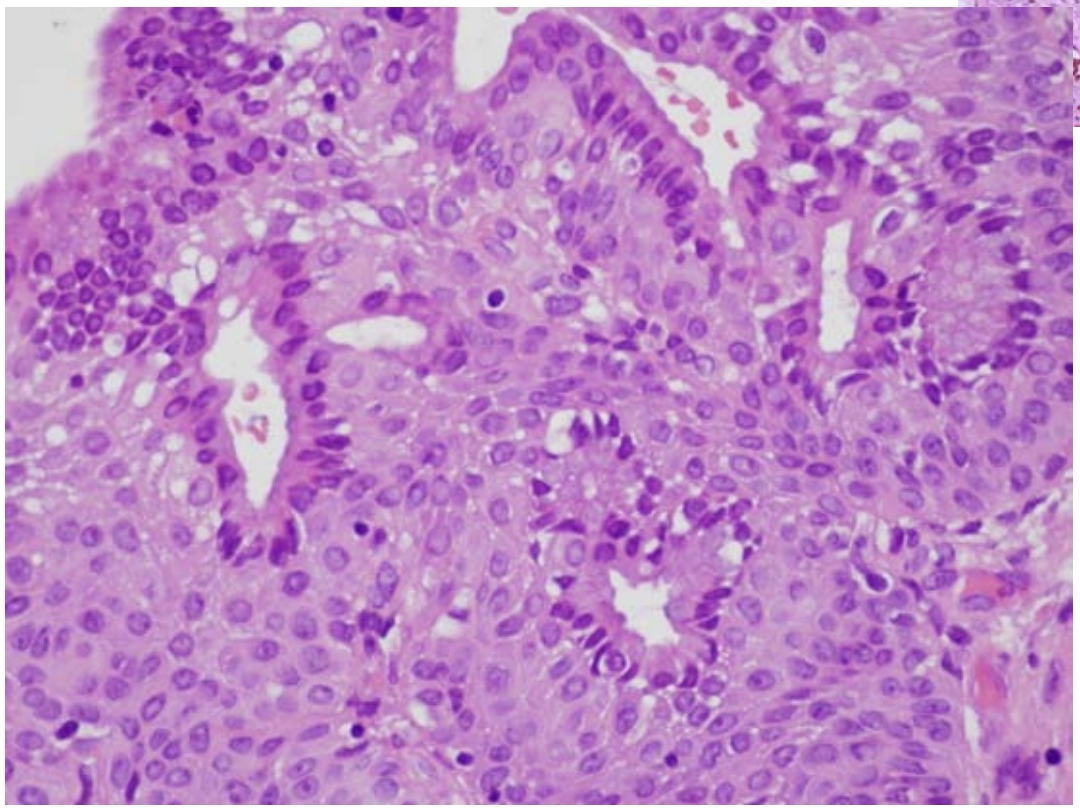


Barrett-adenocarcinoma

Metaplasia – not precancerous

Squamous metaplasia in the prostate…

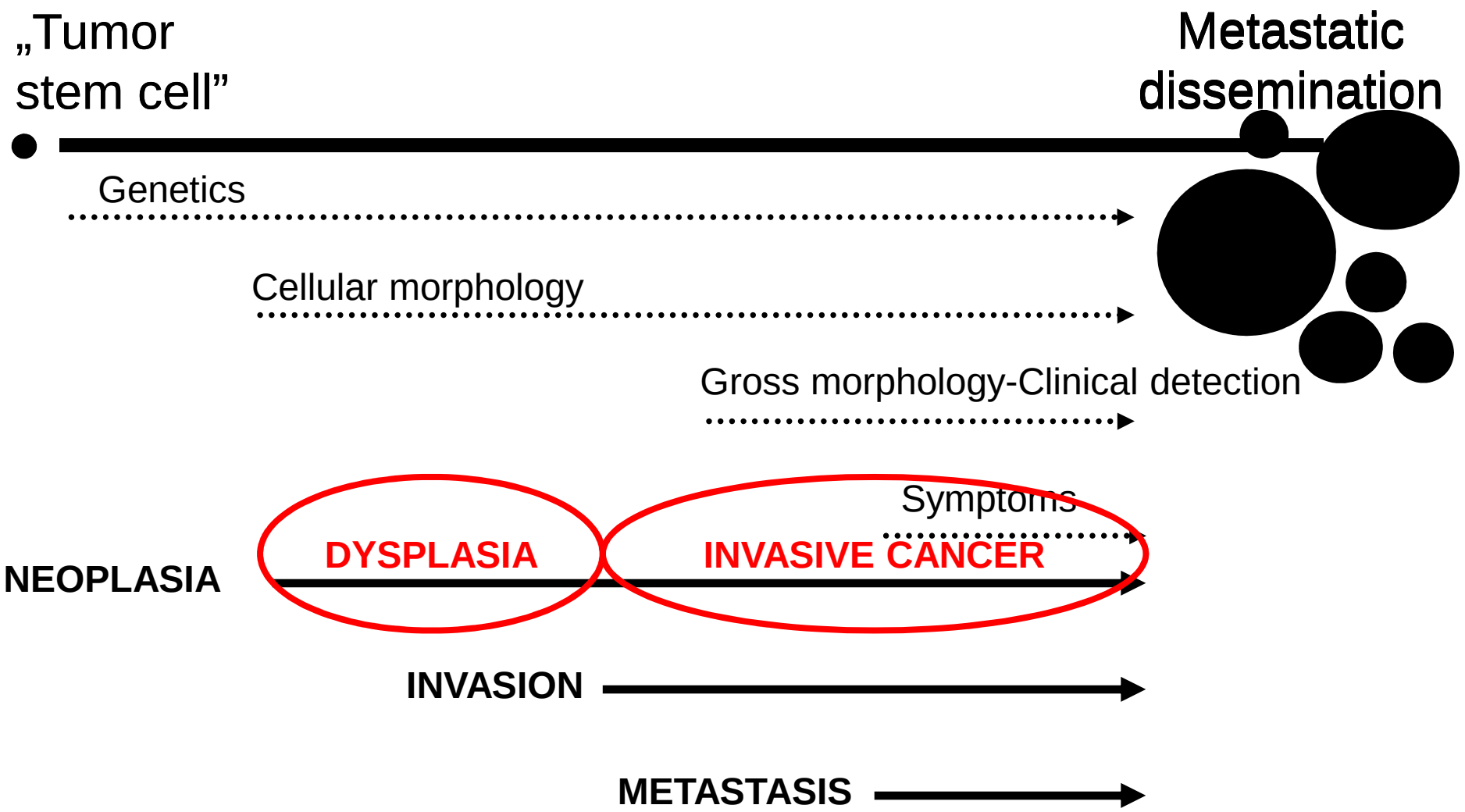




and in the endocervix

Neoplasia

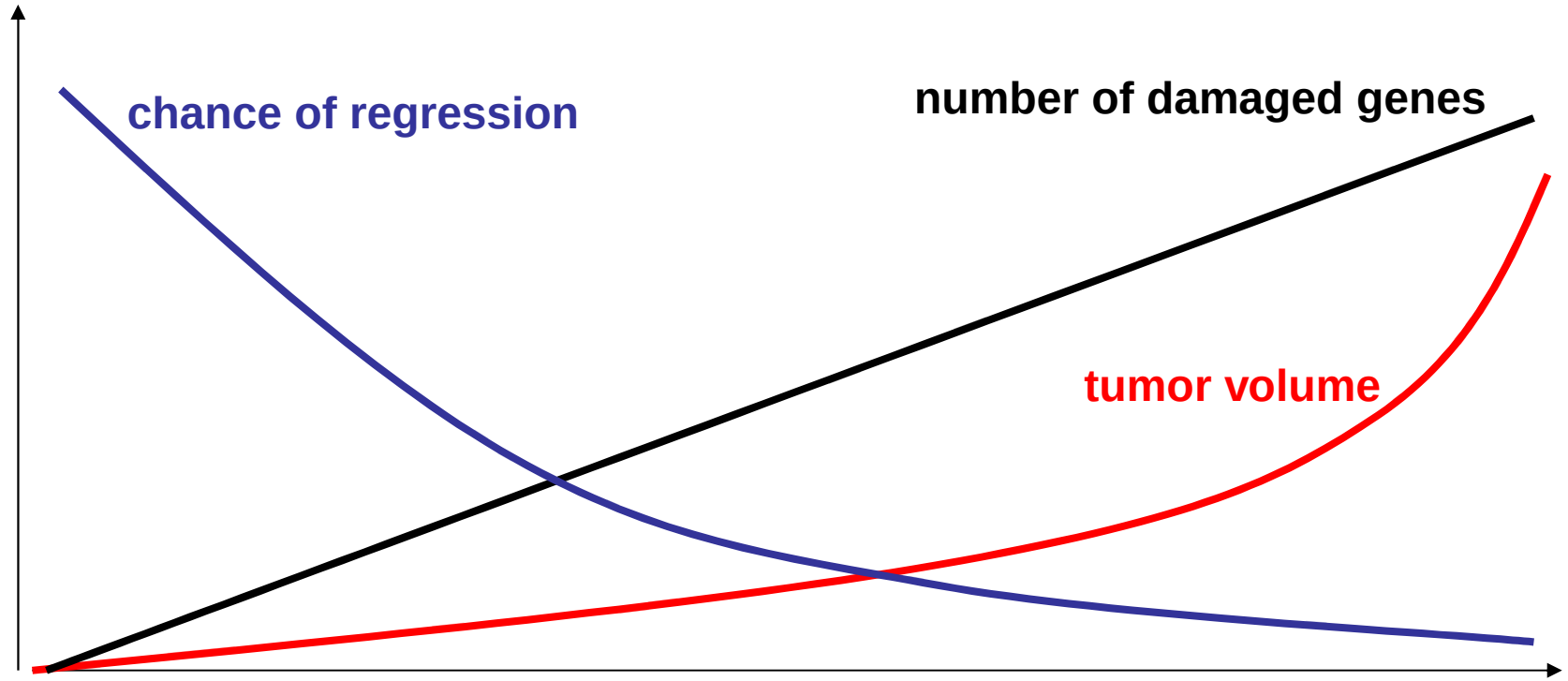
Carcinogenesis



Carcinogenesis

„Tumor stem cell”

Metastatic dissemination



Morphology

Cellular

- **NUCLEAR ATYPIA**
- **POLYMORPHISM**
- **MITOSES**

- Cell death=necrosis

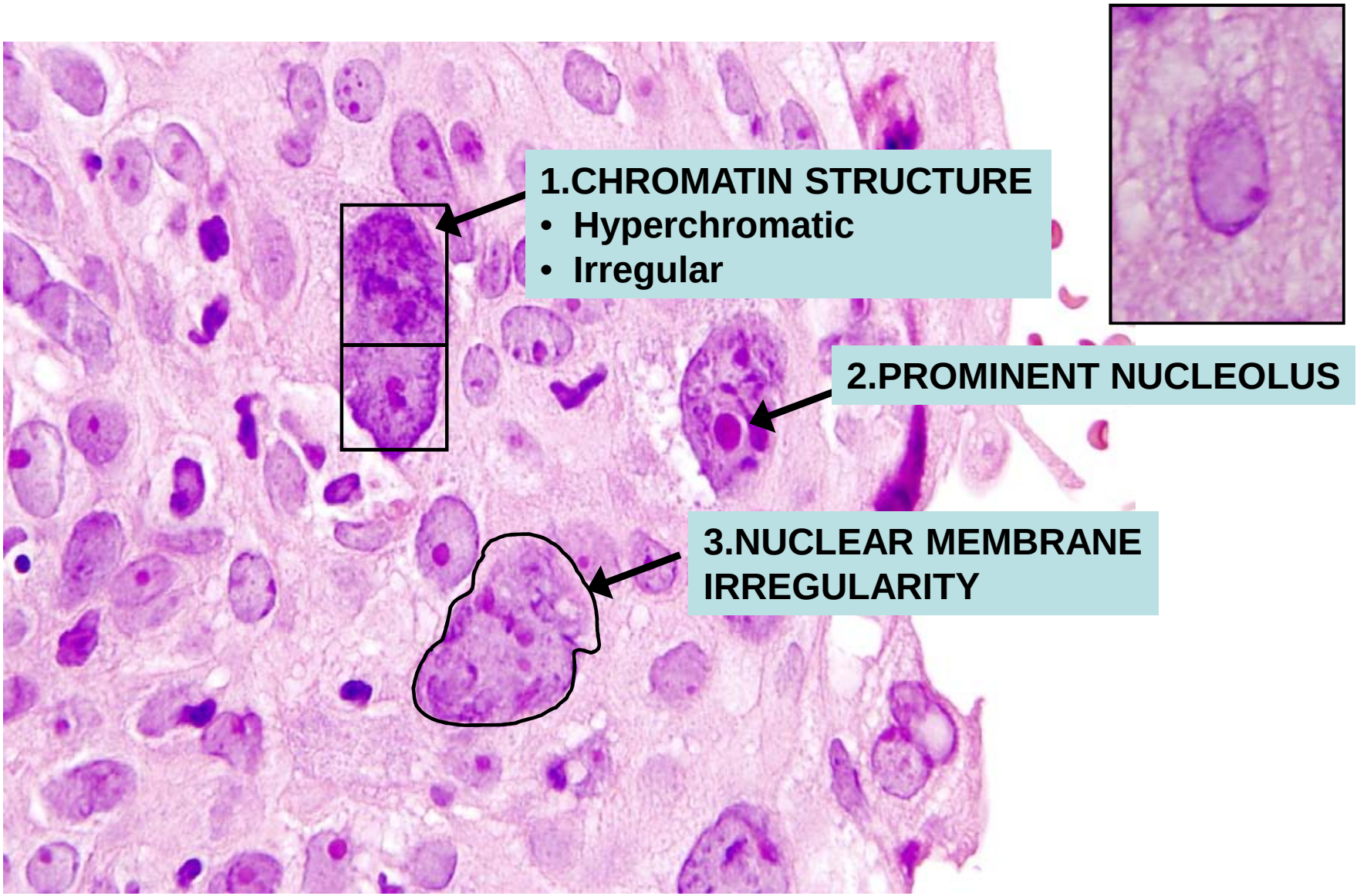
Structural

- Loss of normal integration
  - Loss of maturation
  - Loss of polarisation

DYSPLASIA

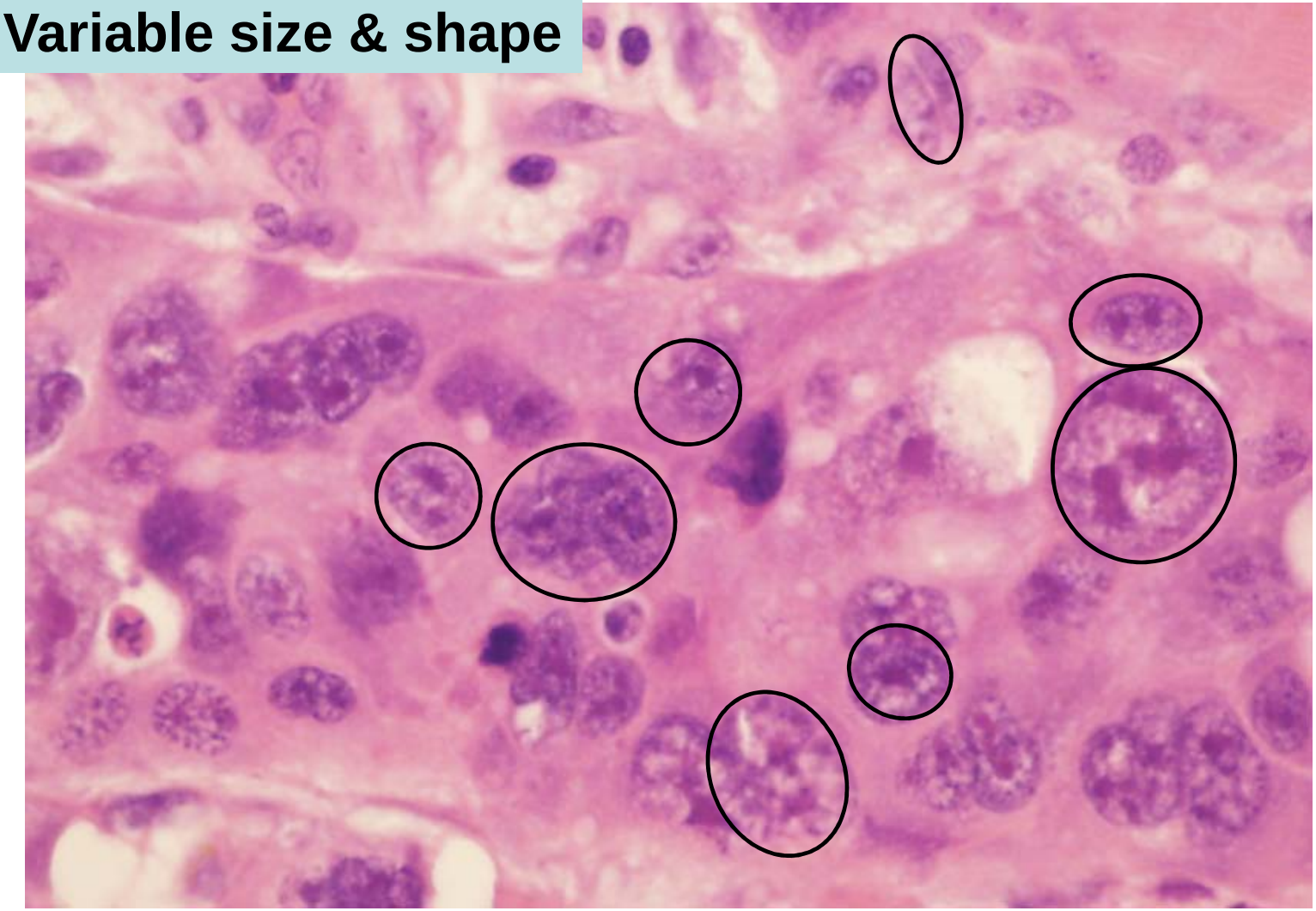
- **INVASION**

NUCLEAR MORPHOLOGY I.



POLYMORPHISM

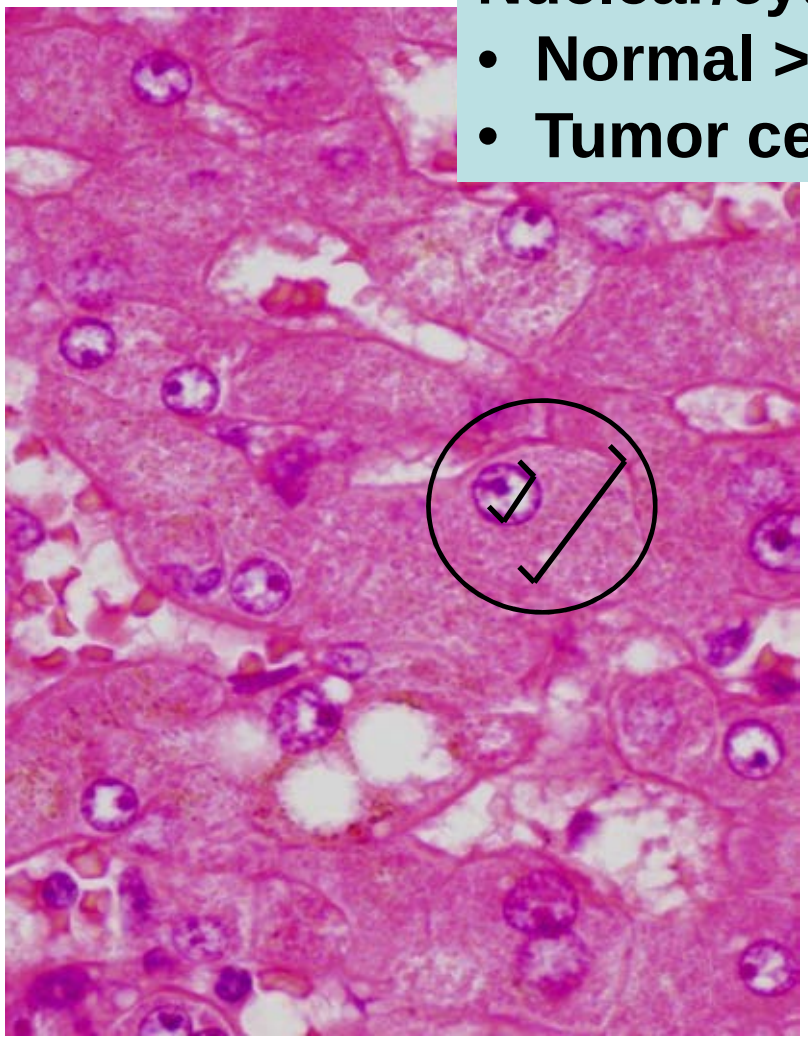
Variable size & shape

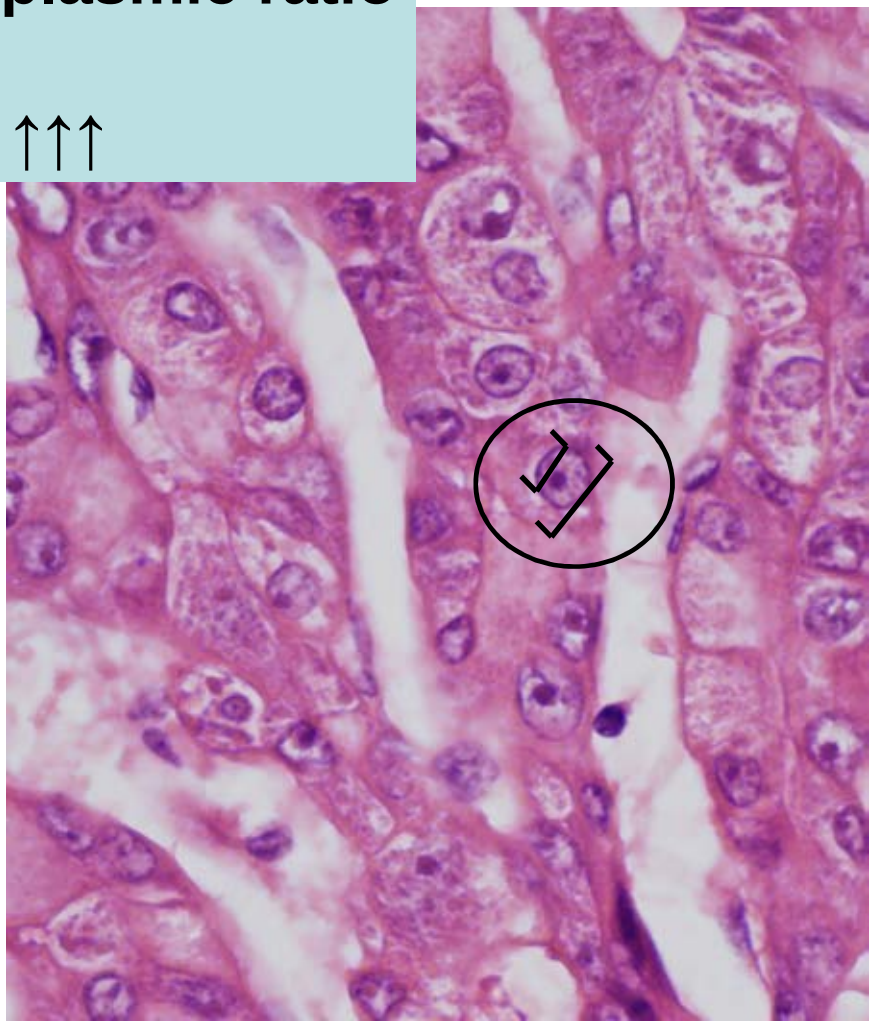


NUCLEAR MORPHOLOGY II.

Nuclear/cytoplasmic ratio

- **Normal >1**
- **Tumor cell ↑↑↑**





MITOSIS

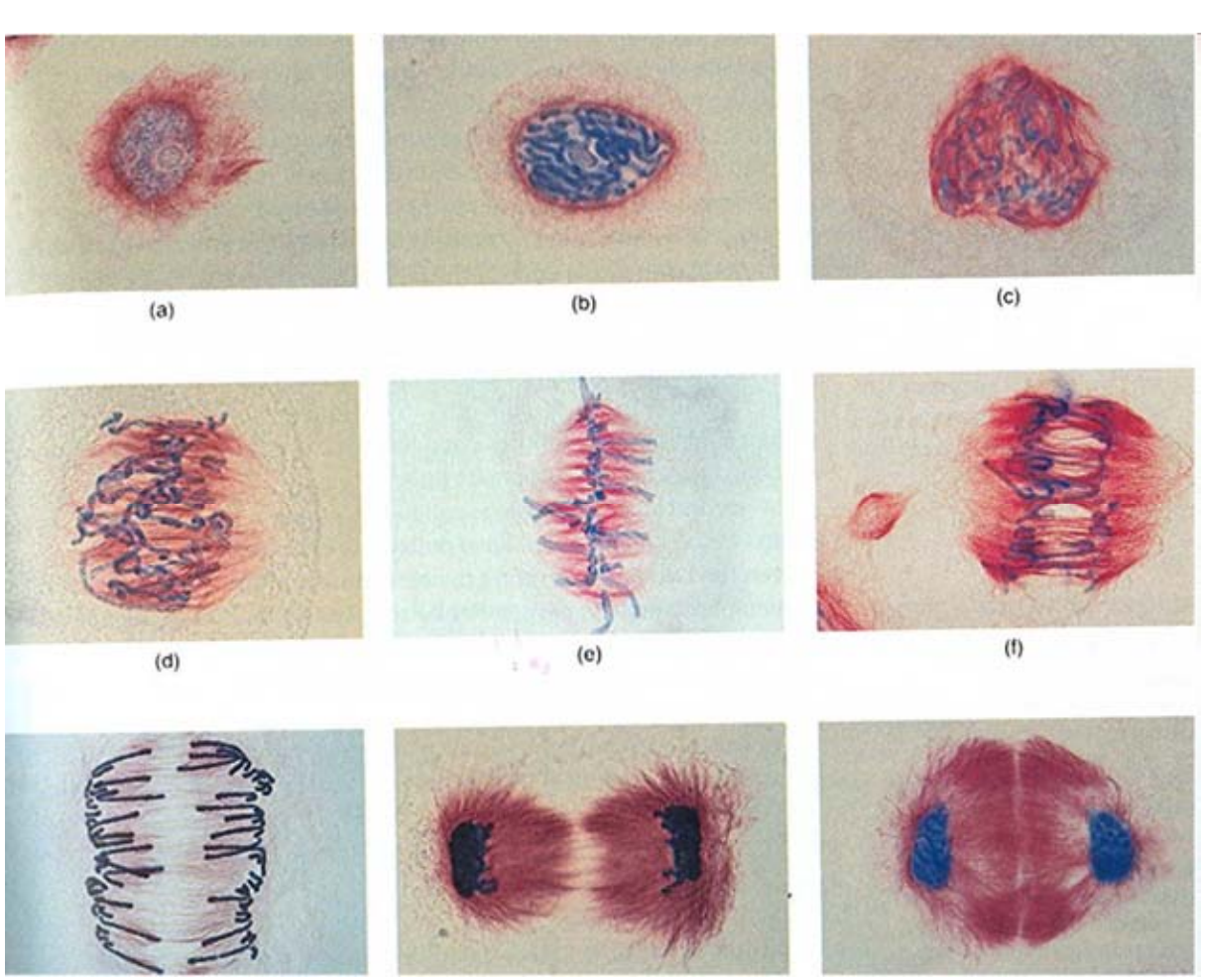
NUMBER

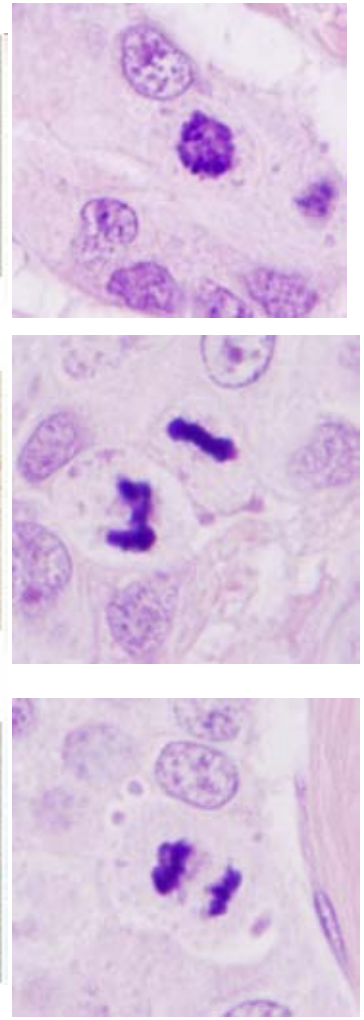
- Proliferating tissues
  - – Abnormal location
- „Stable tissues”
  - – Number ↑

MORPHOLOGY

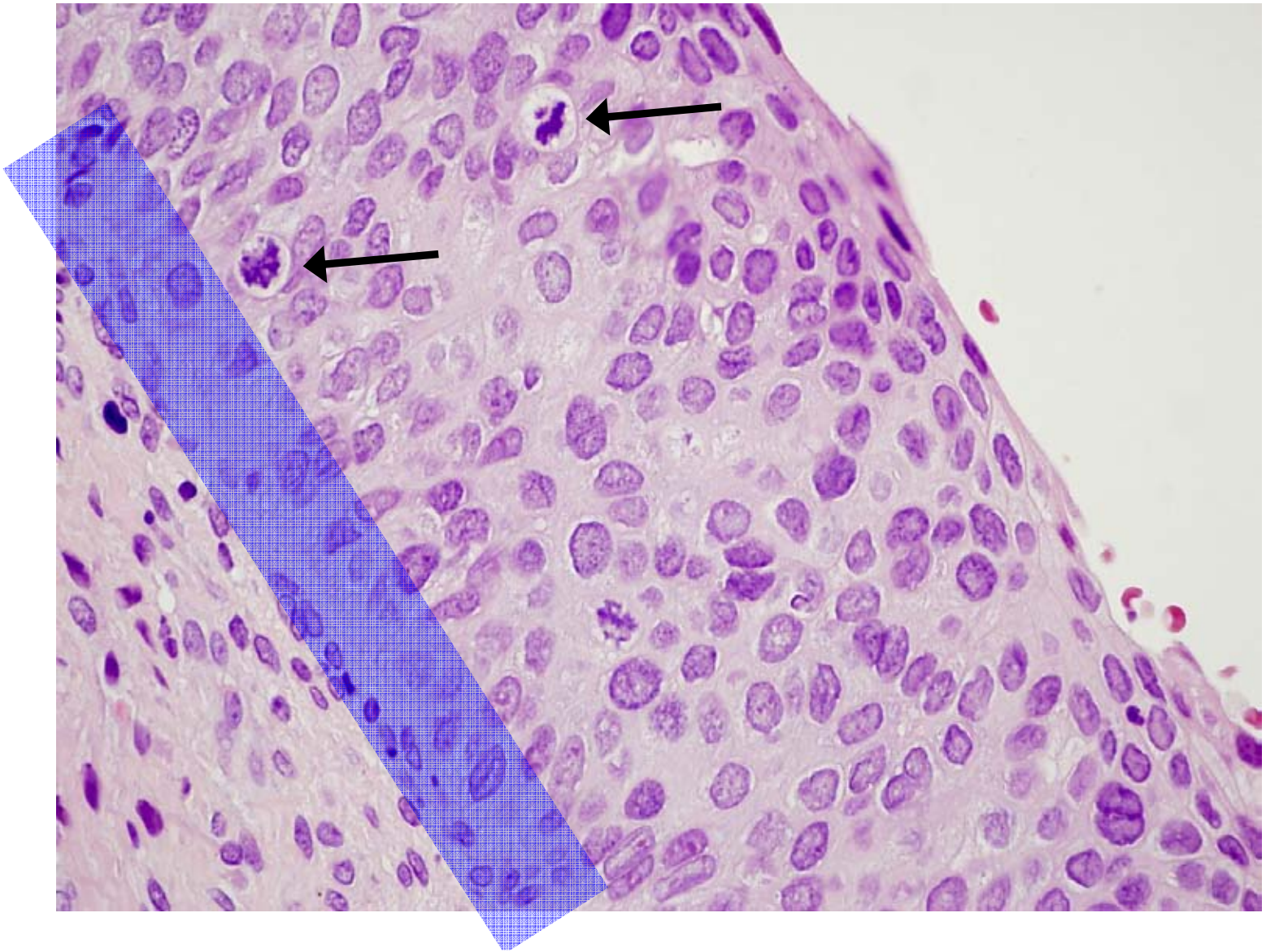
- – Atypical mitoses – **absolute sign of malignancy!!**

MITOSIS
Normal morphology

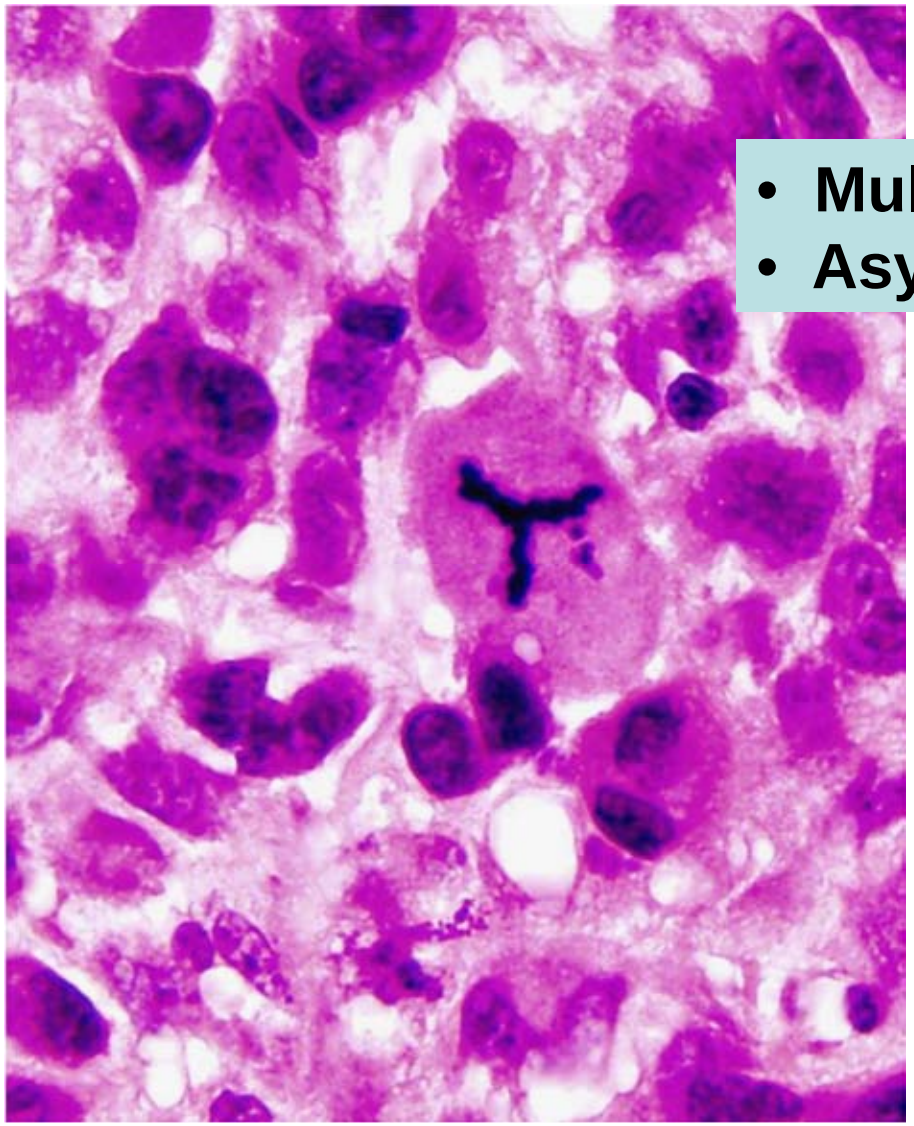




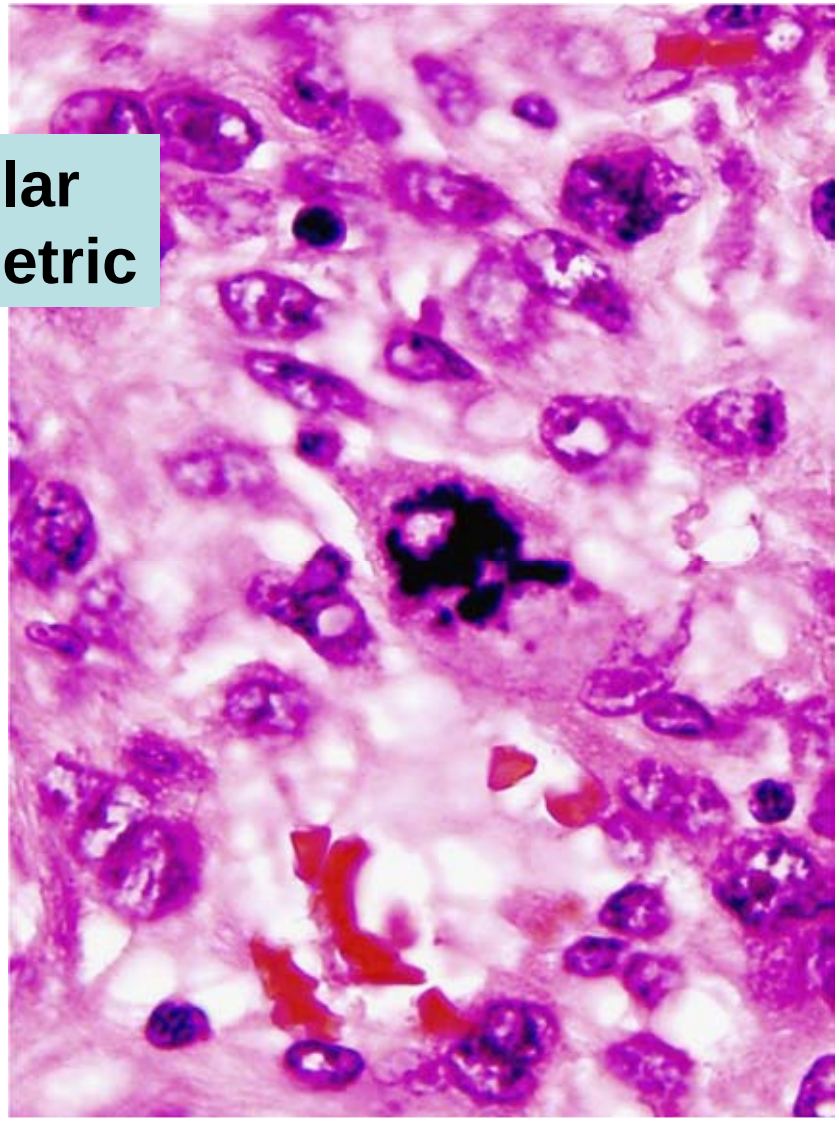
Mitosis in abnormal location



Atypical mitosis

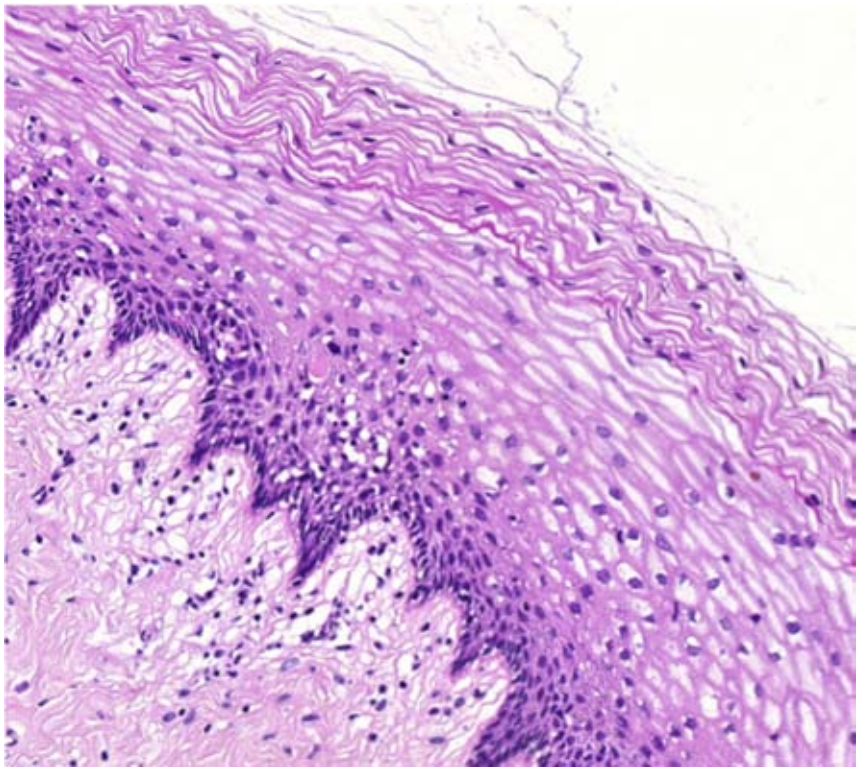


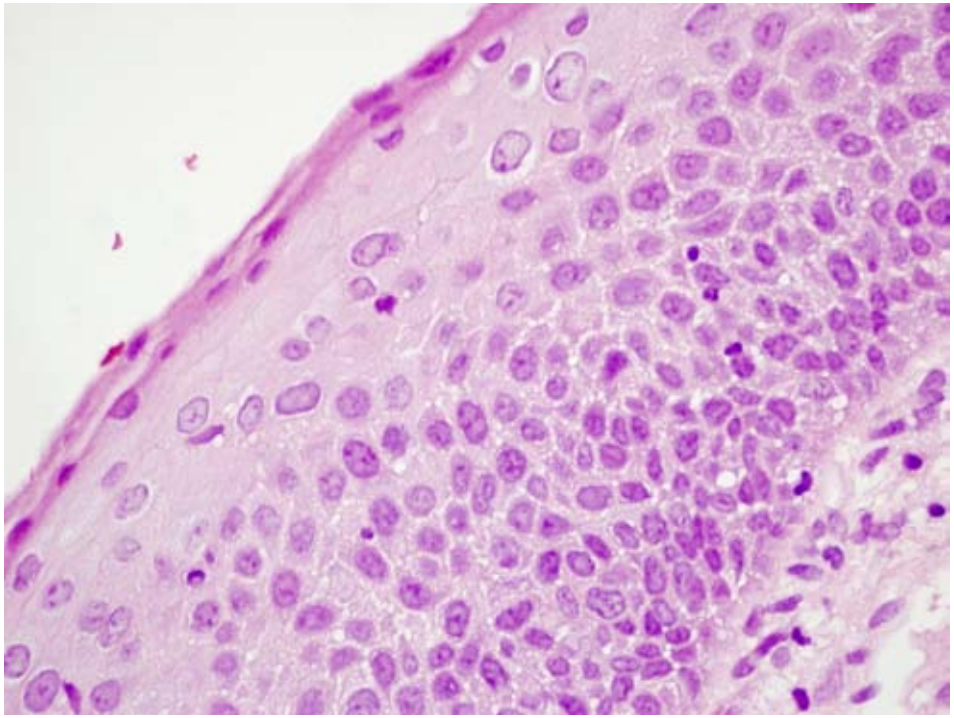
- **Multipolar**
- **Asymmetric**



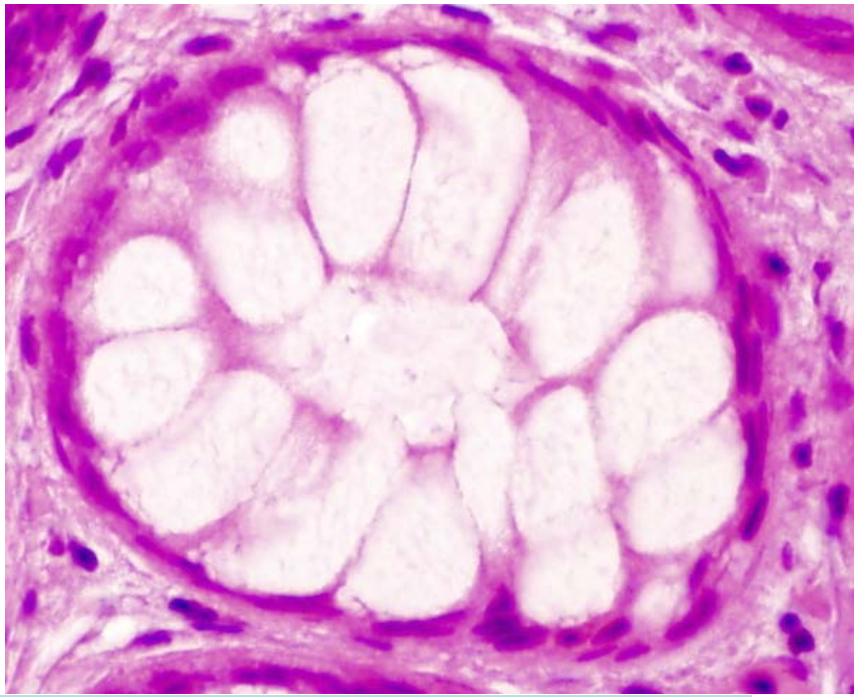
Loss of organisation

Loss of organisation

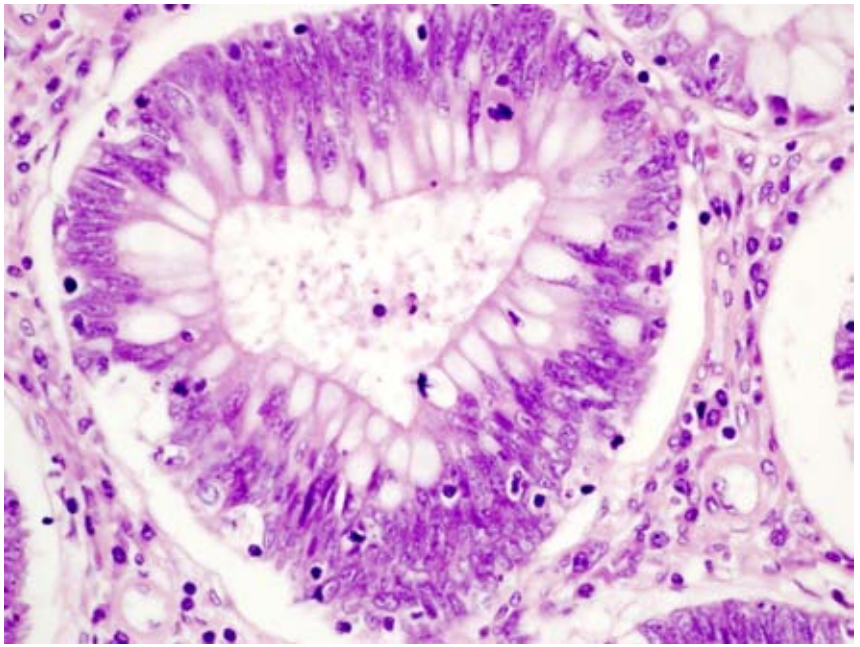




Abnormal polarisation of nuclei

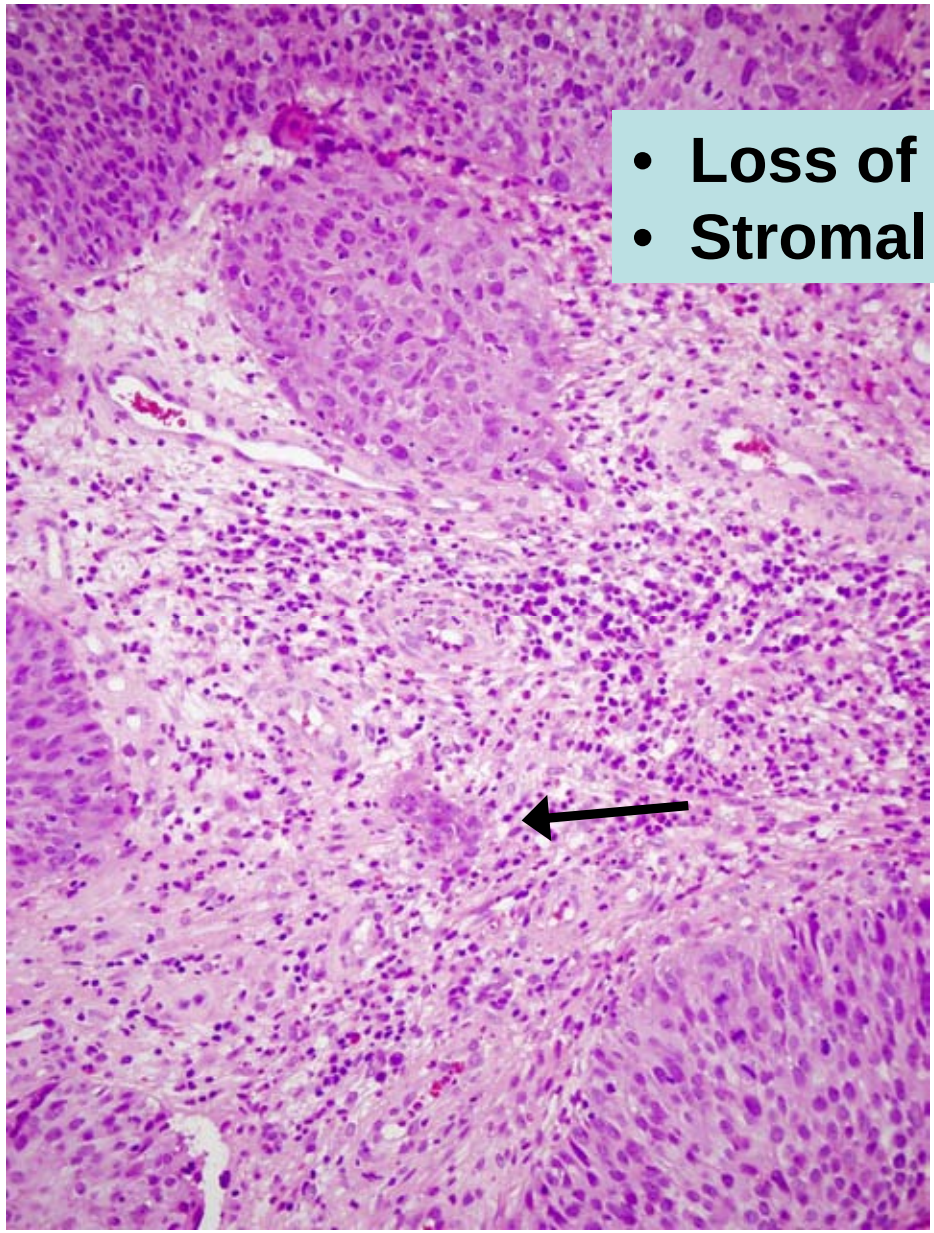


Normal – basally located

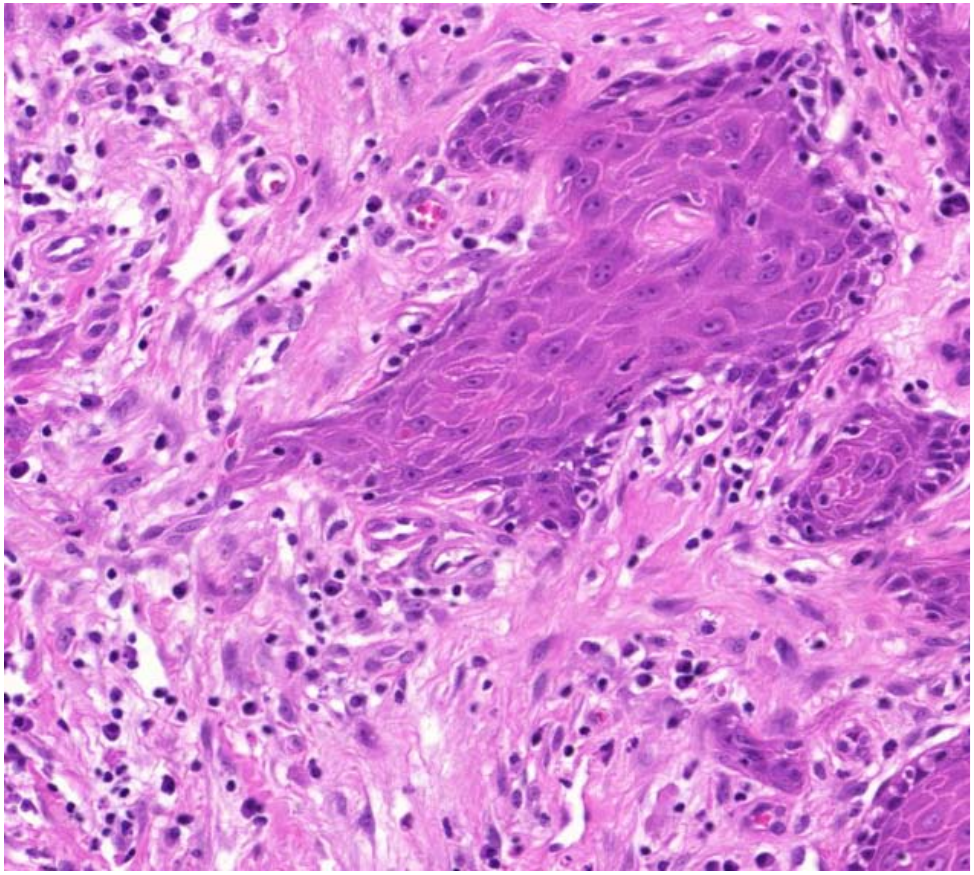


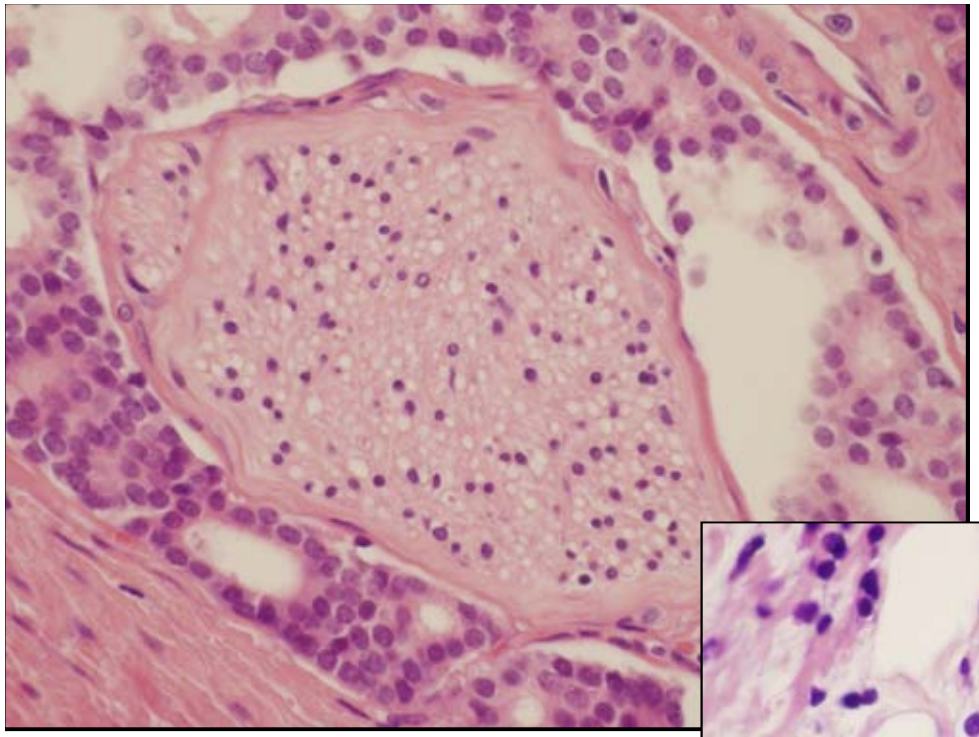
Dysplasia - pseudostratified

INVASION

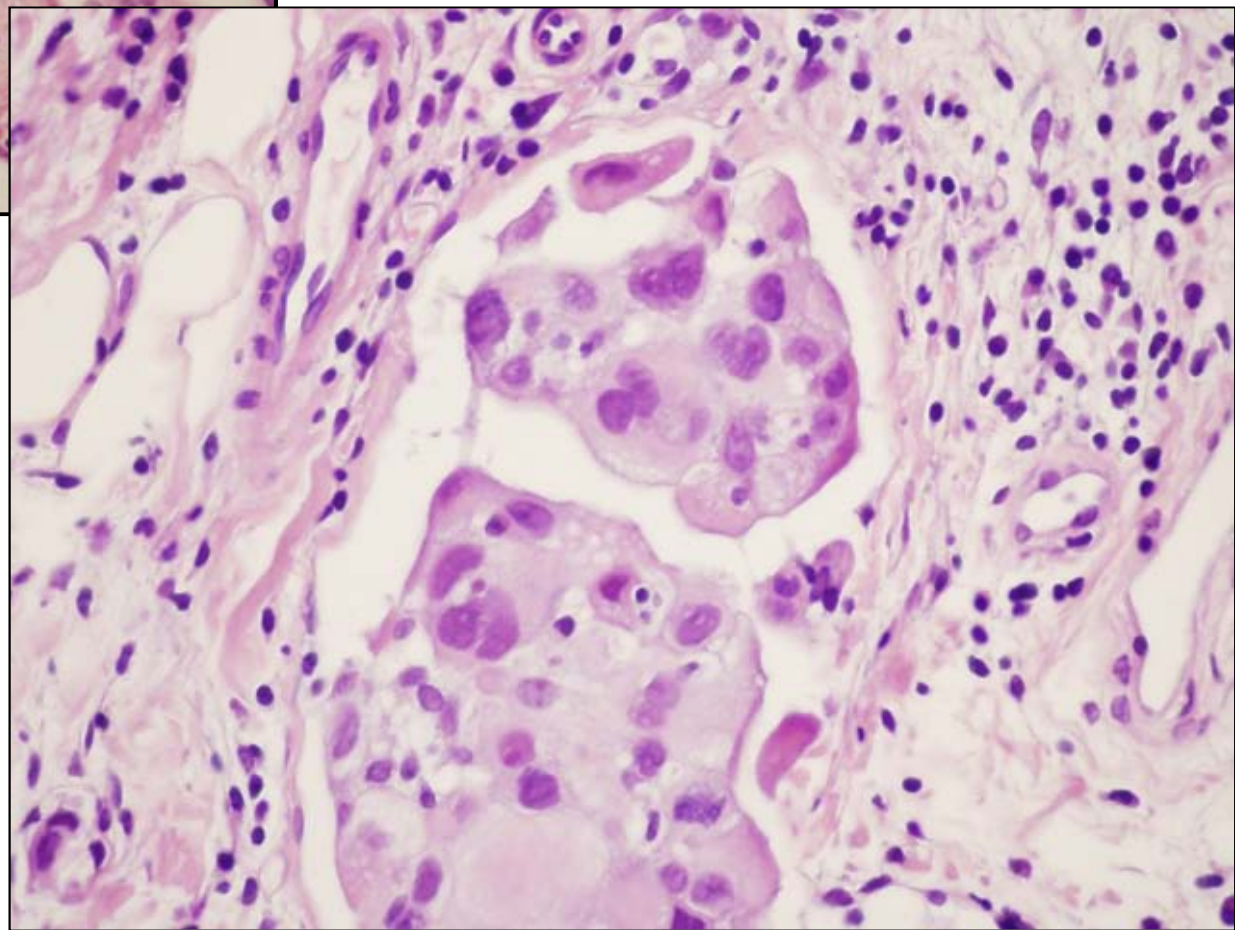


- **Loss of connection with epithelium**
- **Stromal reaction/inflammation**

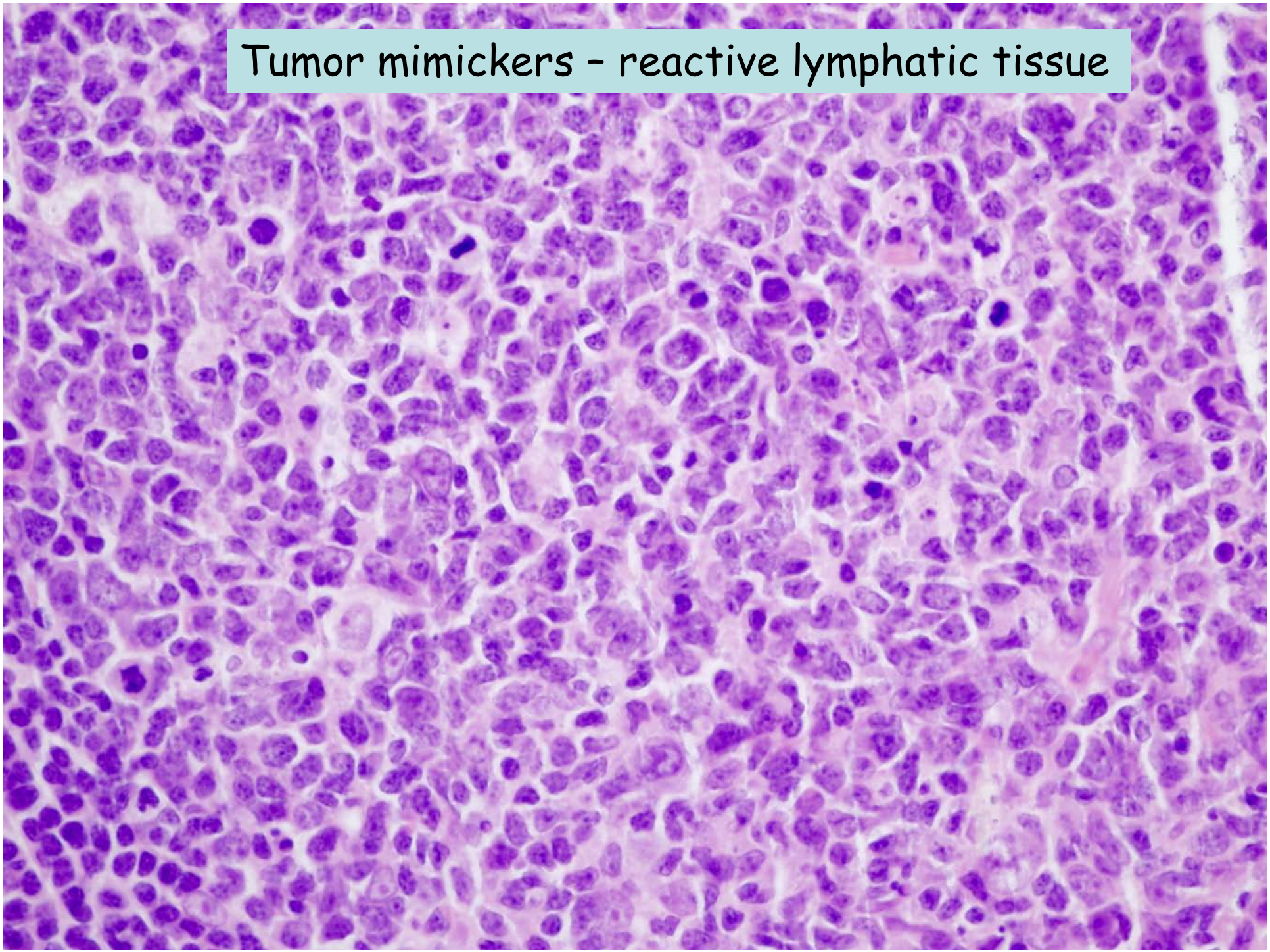


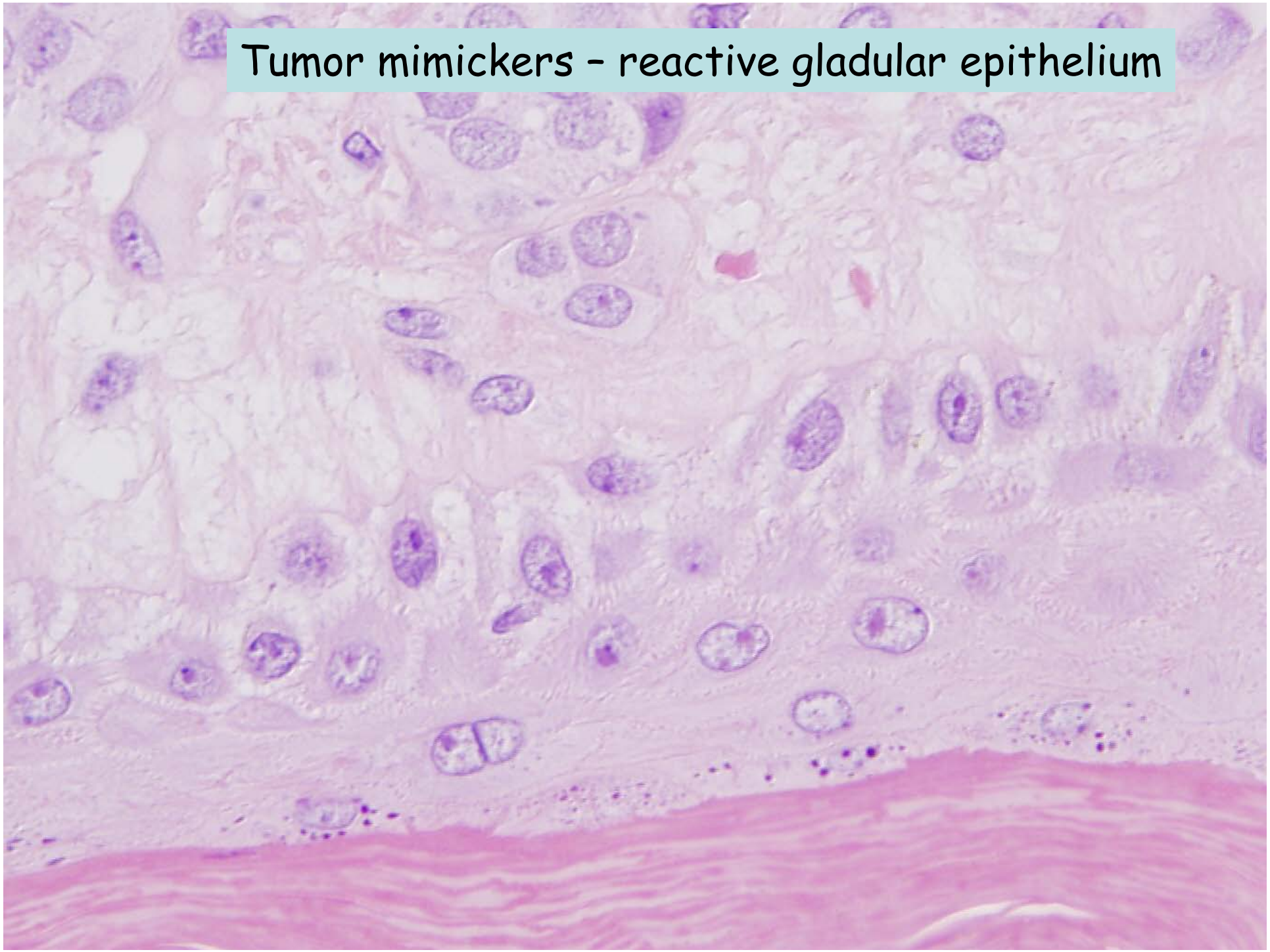


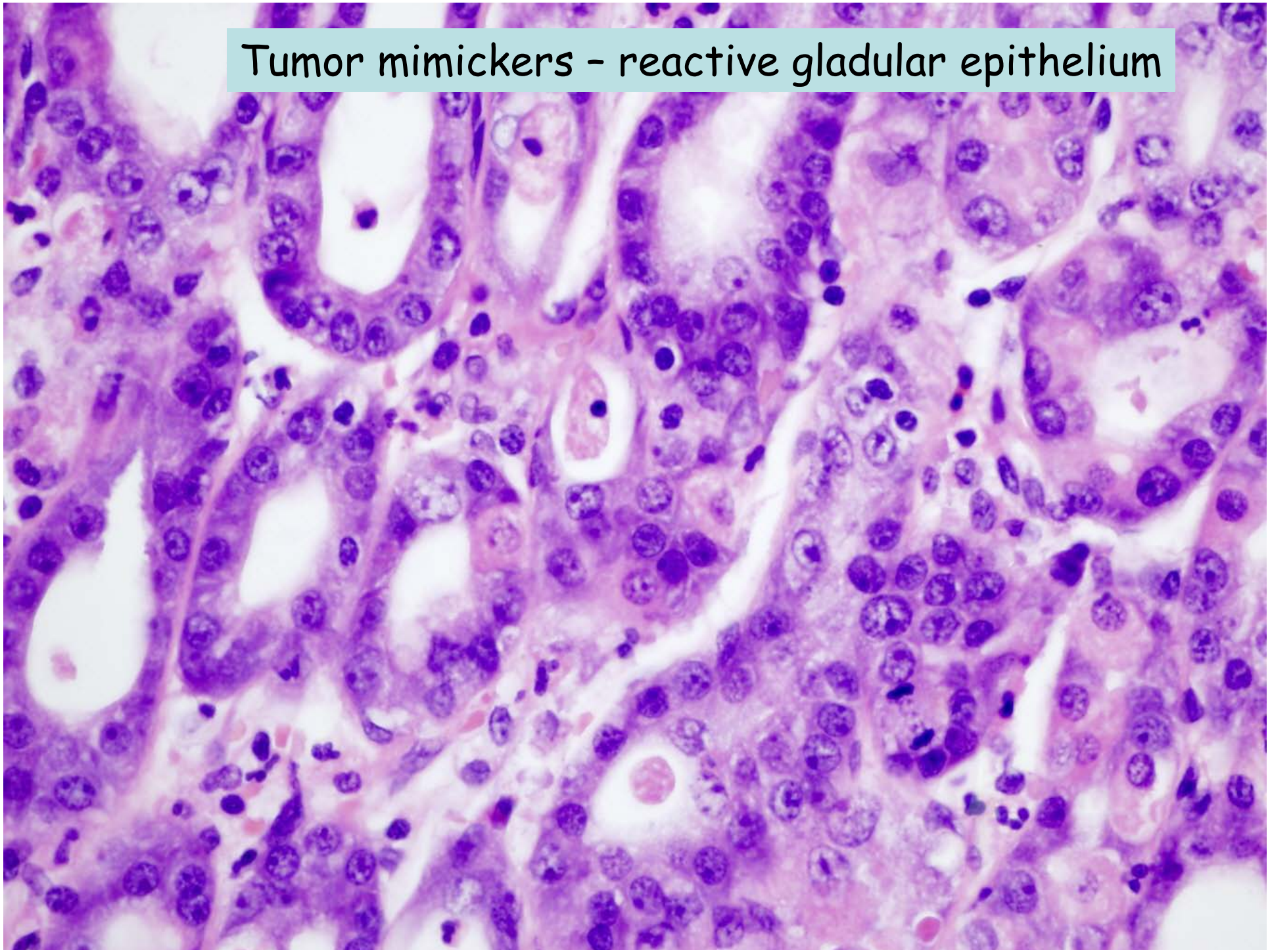
Perineural



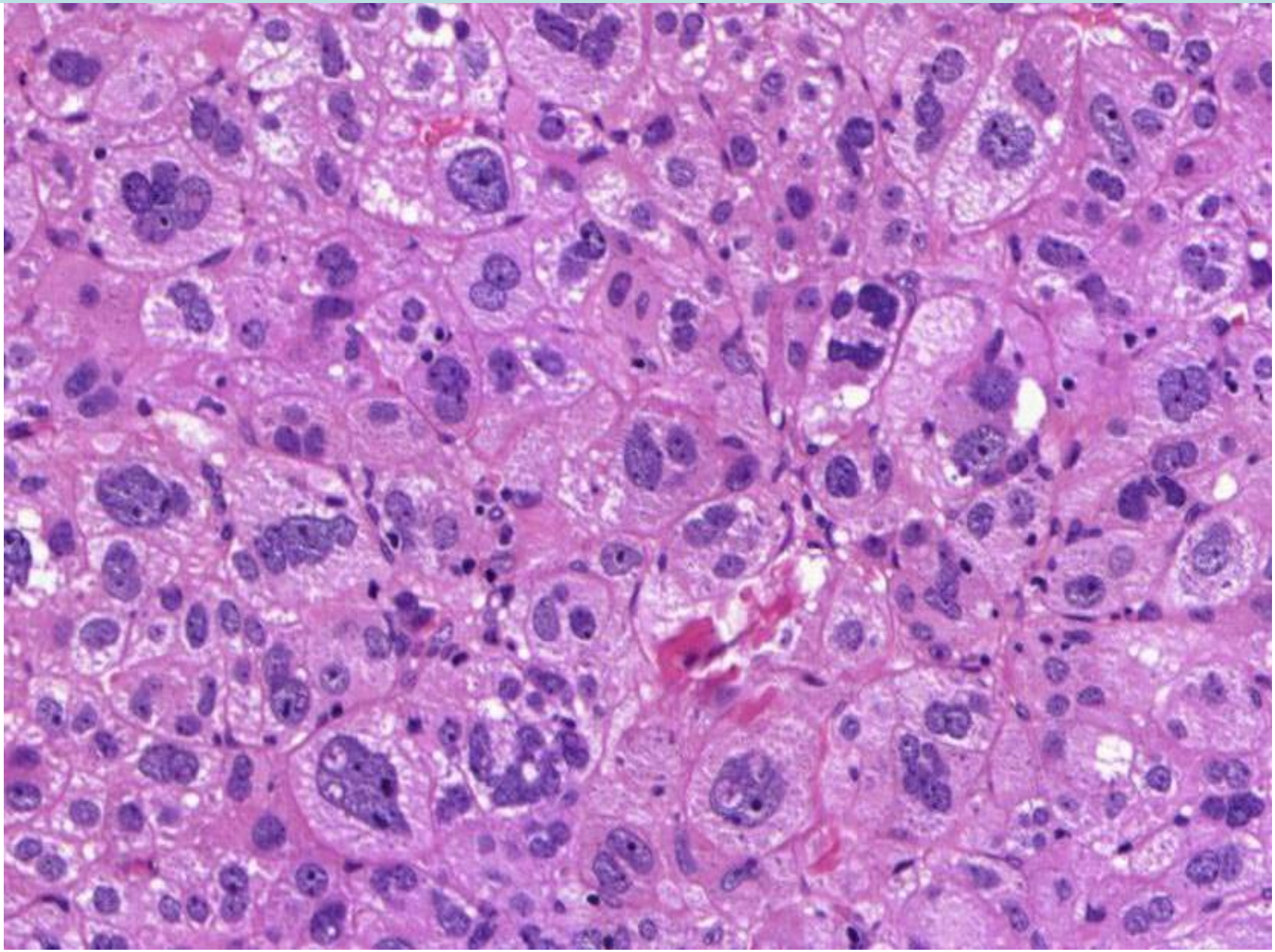
Lymphovascular


Tumor mimickers – reactive lymphatic tissue


Tumor mimickers – reactive gladular epithelium


Tumor mimickers – reactive gladular epithelium

Tumor mimickers – polymorhism in benign processes
Degeneration, post irradiation, endocrine hyperactivity, etc…



General gross features of benign and malignant tumors

Benign:

Slow growing

Well demarcated,
Symmetric

Malignant:

Fast growing

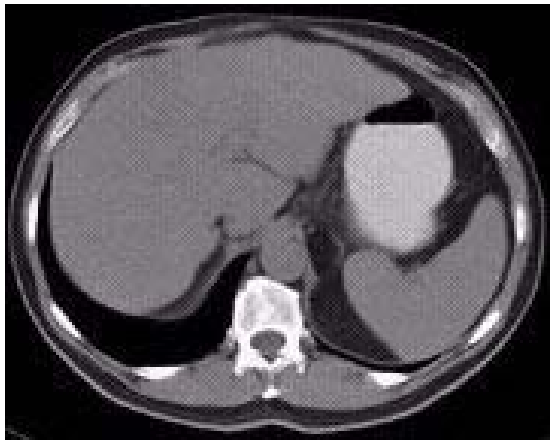
Ill defined borders
Assymetric

General gross features of benign and malignant tumors

Benign:

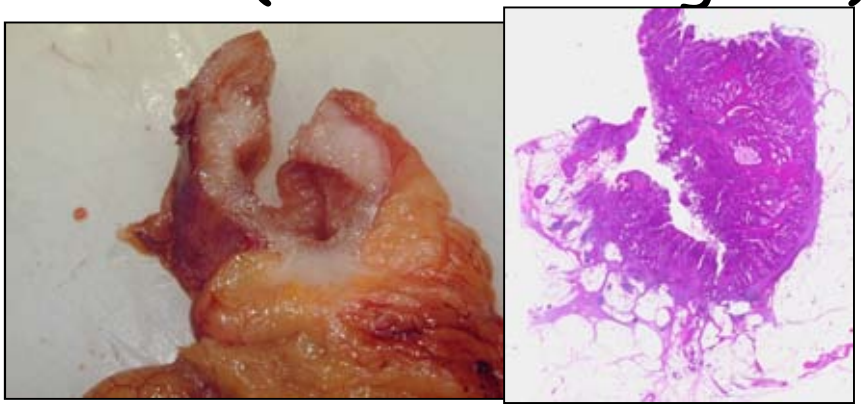
Non invasive (expansive grow)

No metastasis

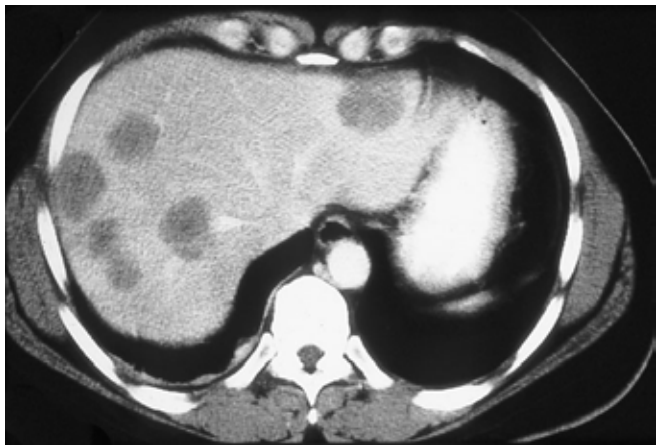


Malignant:

Invasive (infiltrative grow)



Metastasis



General cellular features of benign and malignant tumors

Benign

= normal-like cells

No mitosis, no necrosis, no infiltration

Malignant

Polymorphism, N/C ratio↑, hyperchromasia, irregular nuclear shape, prominent nucleolus,

abnormal mitosis

Necrosis, infiltration, metastasis

Morphology vs biological behavior

HISTO-morphology	SPREAD		CATEGORY
	Invasion	Metastasis	
MALIGNANT	**+**	**+**	**MALIGNANT**
BENIGN	**-**	**-**	**BENIGN**
MALIGNANT Eg. Basal cell carcinoma	**+**	**-**	SEMIMALIGNANT
MALIGNANT Eg. Cystic ovarian tumors	**-**	**-**	BORDERLINE **High rate of recurrence and/or malignant transformation**
UNCERTAIN	**-**	Very low risk	Tumor with uncertain malignant potential

Differentiation (GRADE)

How tumor cells resemble to the normal

Benign = Normal, NO GRADE

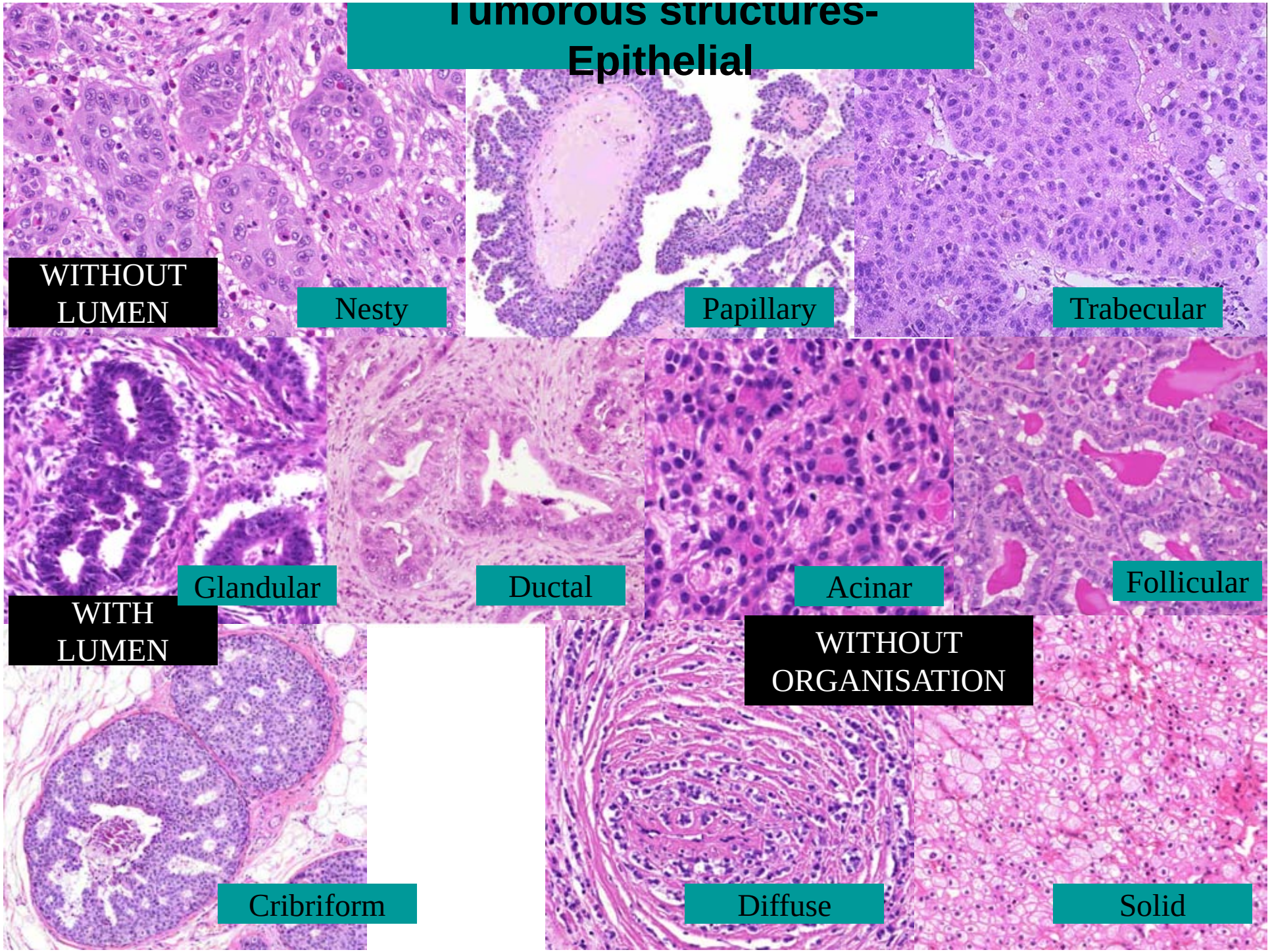
Malignant - Well differentiated (Grade I)
- Intermediately differentiated (Grade II)
- Poorly differentiated (Grade III)
- Undifferentiated=Anaplastic (Grade IV)

Extension of the disease (STAGE)

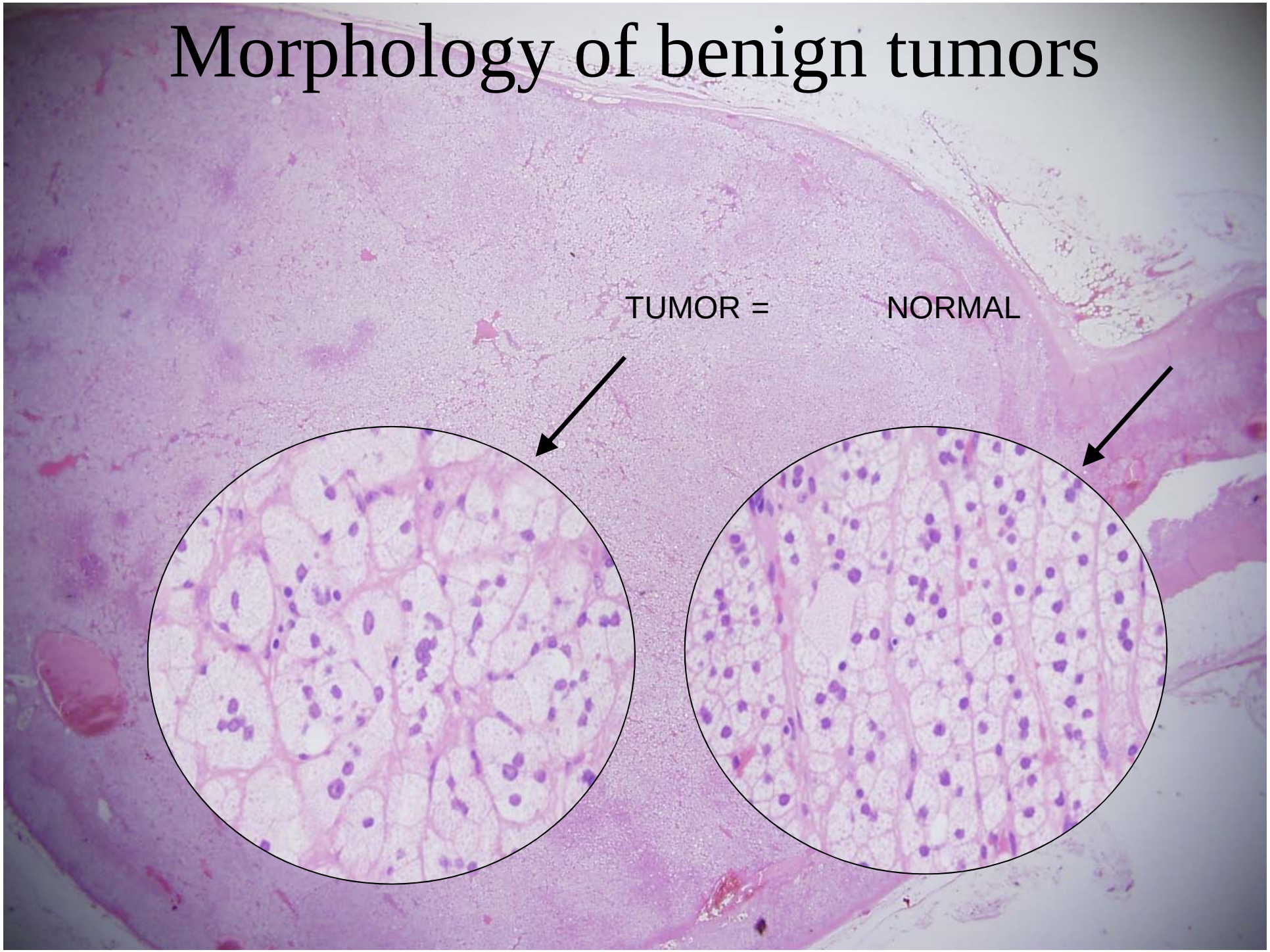
Benign = NO STAGE

Malignant - T= local extension/size of the primary
- N= regional lymph nodes
- M= distant metastases

Tumorous structures- Epithelial

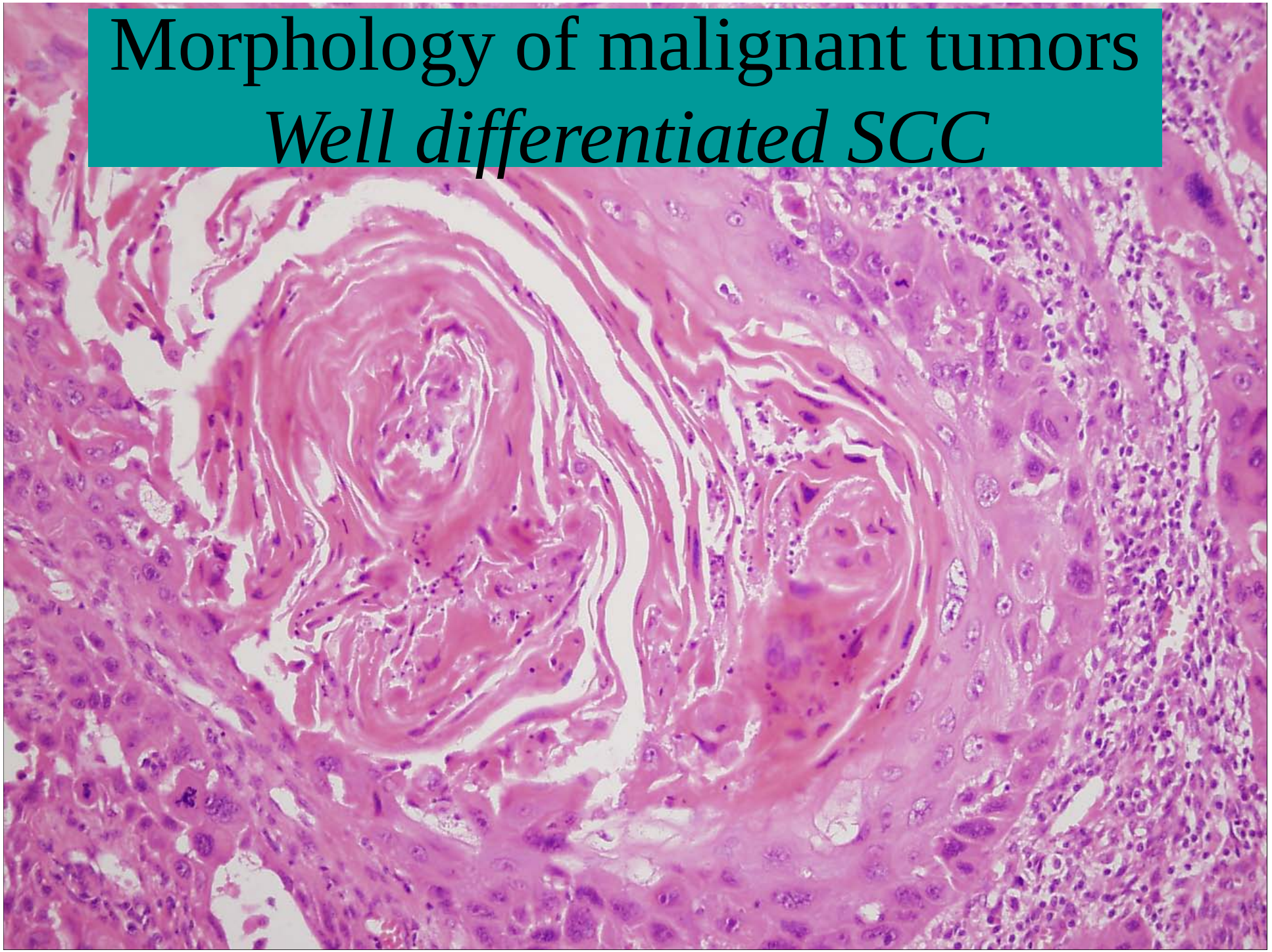


Morphology of benign tumors

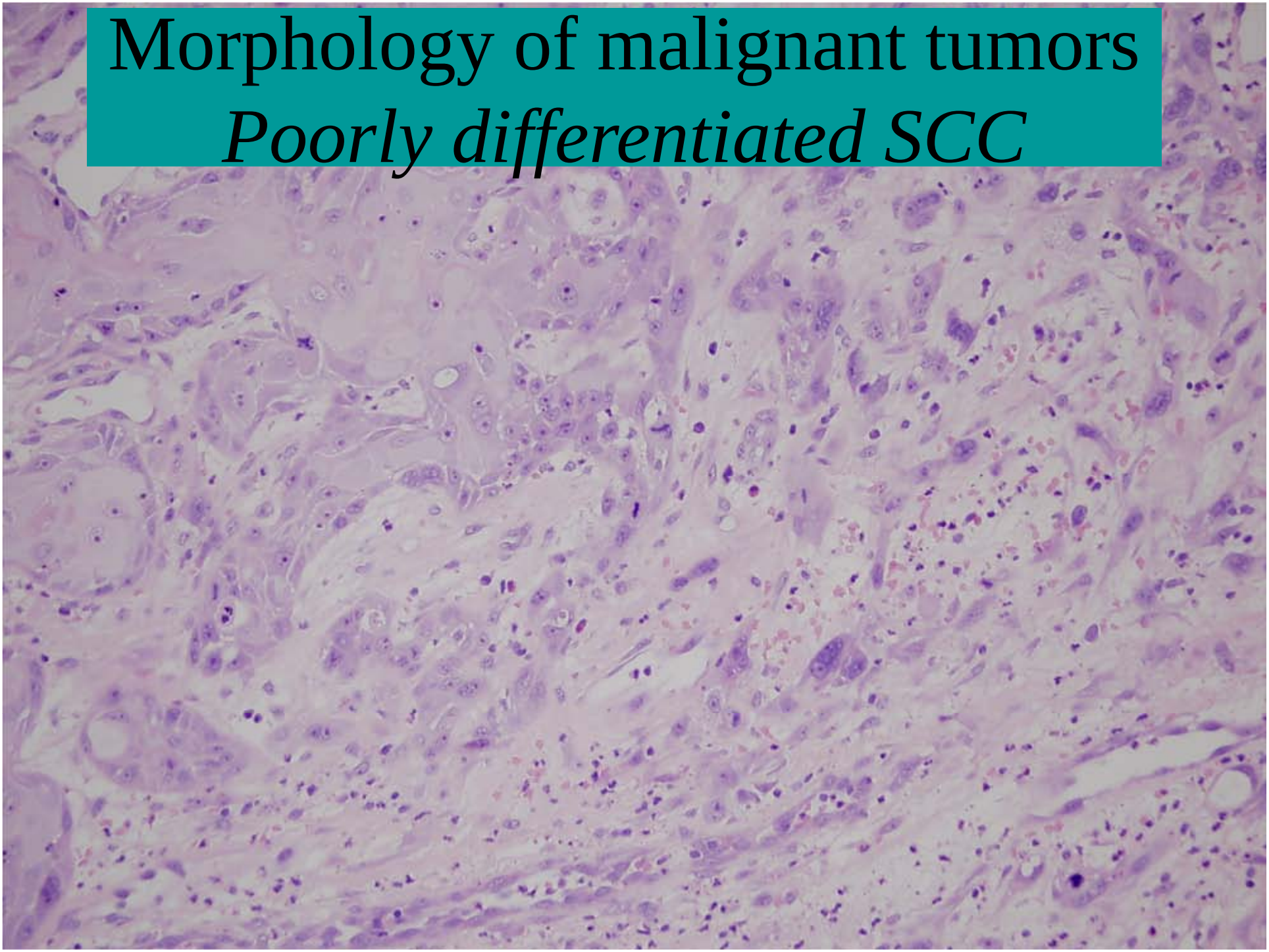


Morphology of malignant tumors

Well differentiated SCC

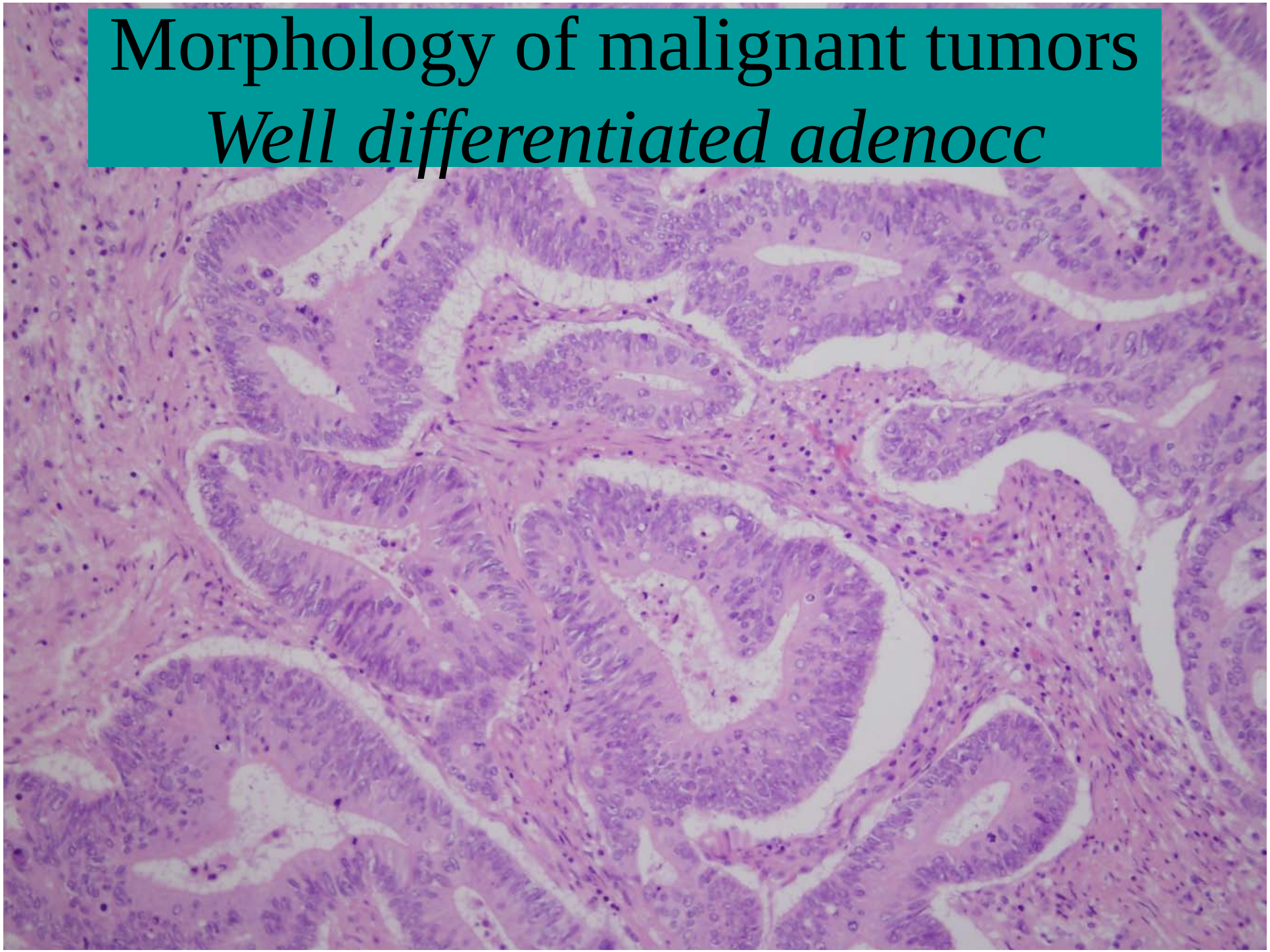


Morphology of malignant tumors
Poorly differentiated SCC



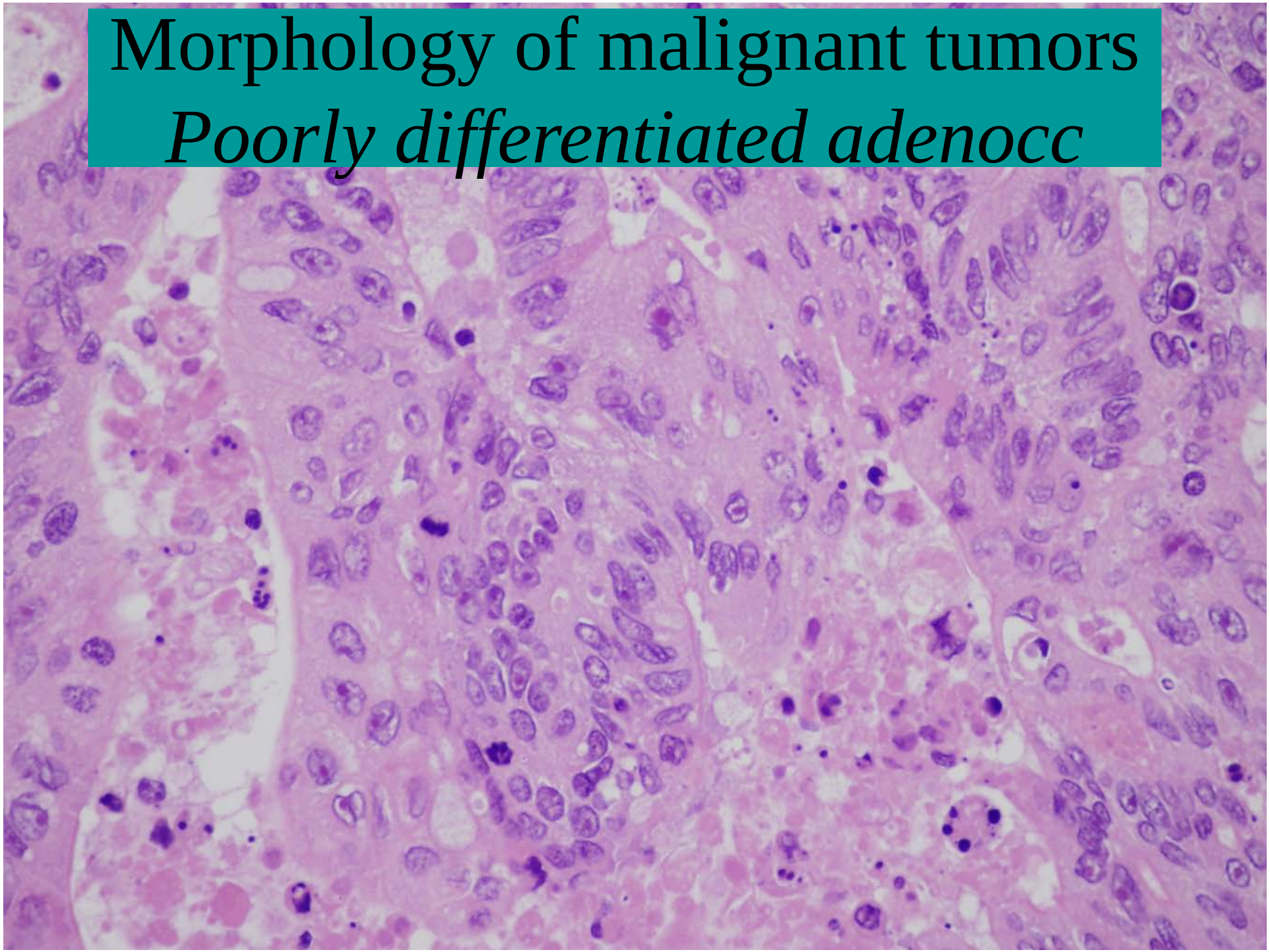
Morphology of malignant tumors

Well differentiated adenocc



Morphology of malignant tumors

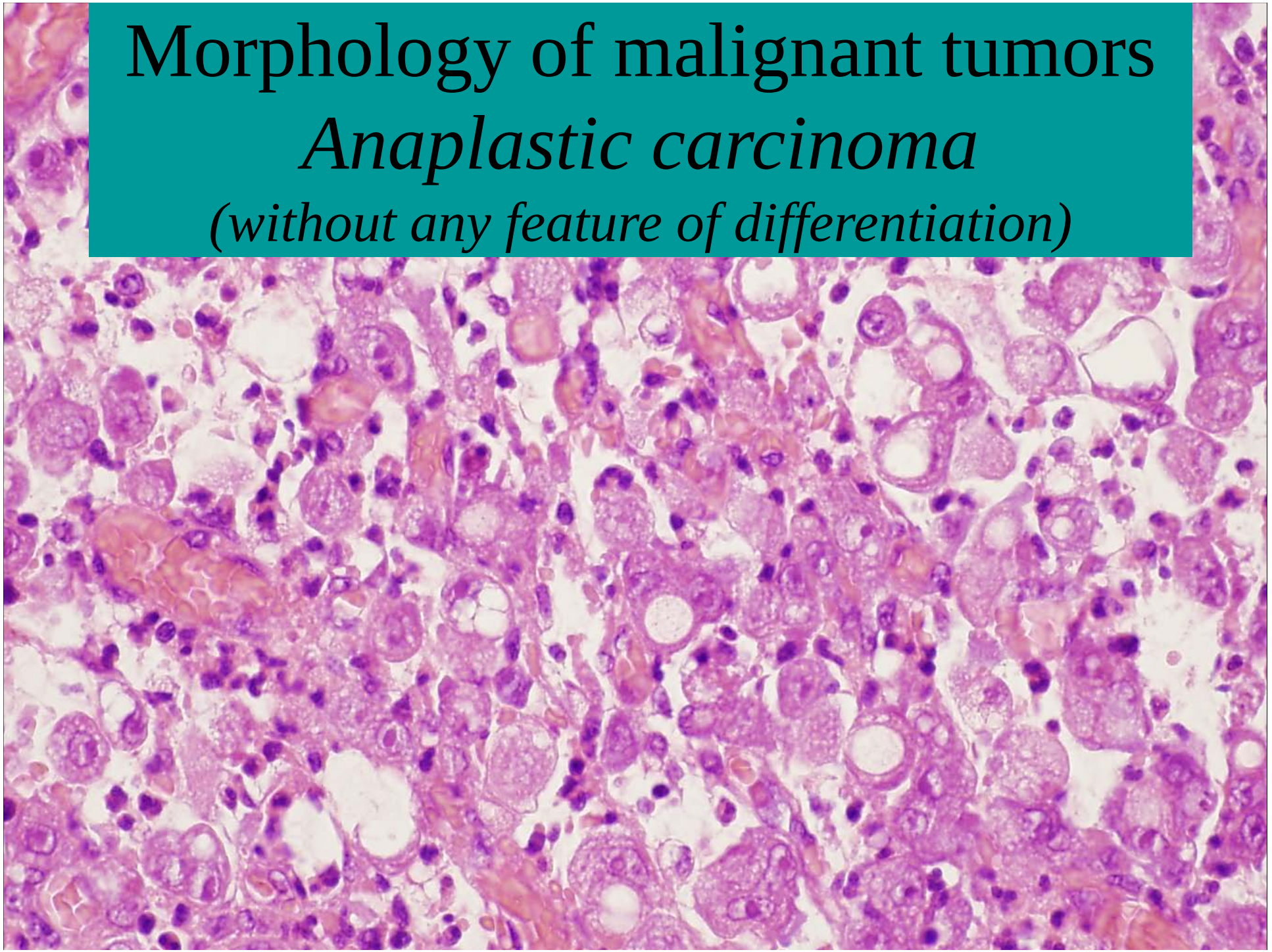
Poorly differentiated adenocc



Morphology of malignant tumors

Anaplastic carcinoma

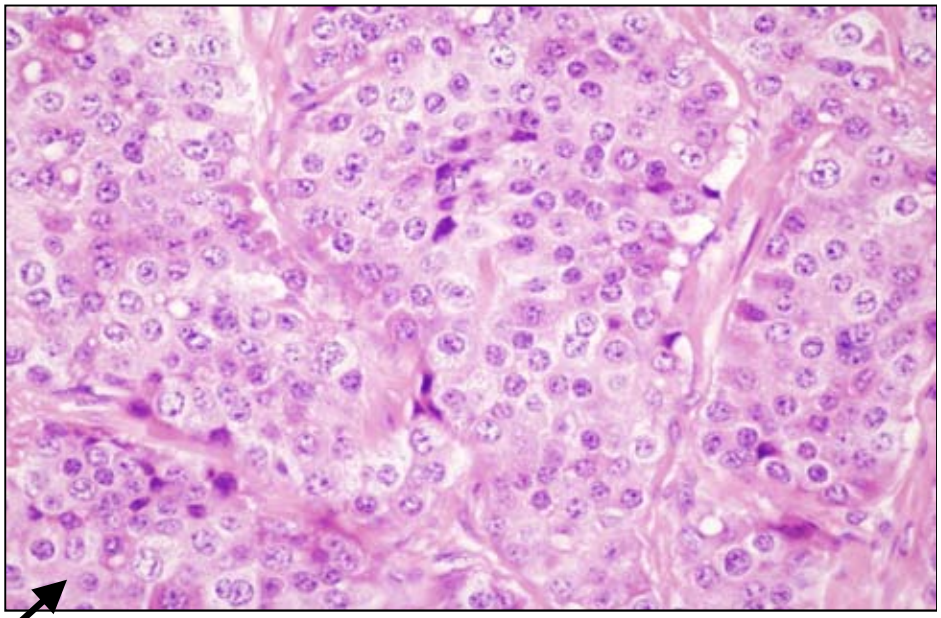
(without any feature of differentiation)



Structure of tumors:

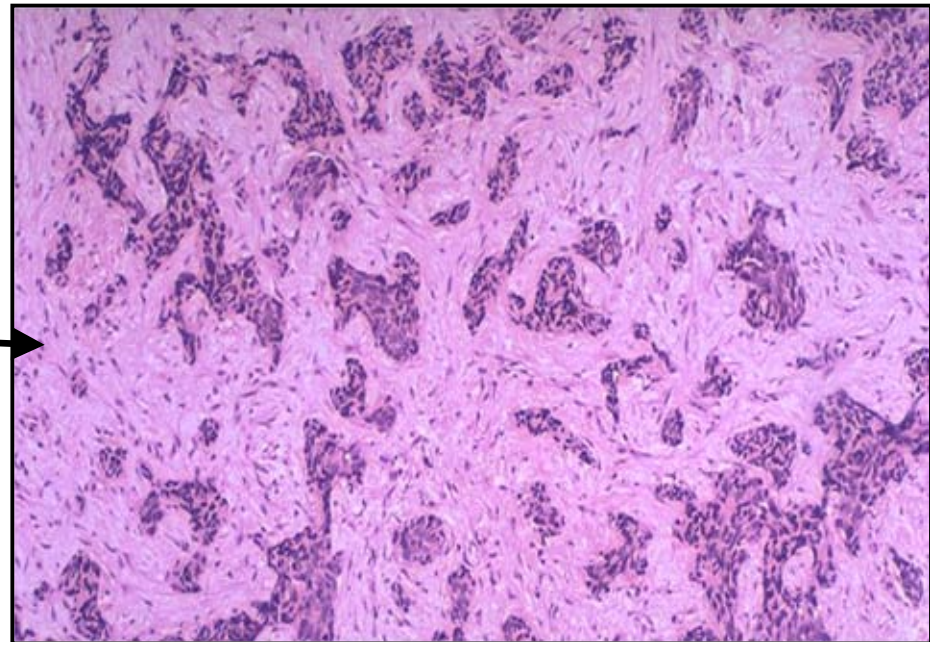
Parenchyma=Tumor cells

Stroma=Connective tissue produced by normal mesenchymal cells due to growth factors released by tumor cells



Cellular tumor=soft

Stroma rich=hard (desmoplastic)



Nomenclature

BENIGN

- **Epithelial**
  - Surface epithel: papilloma
  - Glandular epithel: adenoma
- **Mesenchymal**: cell type+oma
- **Hemato-lympho**: Ø
- **NS**: cell type+oma
- **Melanocytic**: nevus

MALIGNANT

- **Epithelial**
  - Surface epithel: squamous cell/transitional cell carcinoma
  - Glandular epithel: adenocarcinoma
- **Mesenchymal:** cell type+sarcoma
- **Hemato-lympho**
  - Leukemia
  - lymphoma
- **NS**: cell type+oma
- **Melanocytic**: melanoma