Tumour pathology
Definition, Classification and Nomenclature

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Definition

- **NEOPLASIA - “New growth”**
  (may be benign or malignant)
- Compared with **Hyperplasia**
  - 1. Arises due to a stimulus - physiological / adaptive change
    Exception - Epidermal hyperplasia - Wart viruses
  - 2. Directly related to the degree of stimulation.
  - 3.Regresses /ceases after the stimulation is removed.

Definition

- A tumour is a mass of cells, tissue or organs, **??? resembling** those normally present but arranged atypically.
  It grows at the expense of the organism without at the same time subserving any useful function. -
  Powell White

Definition

- **Resemblance** is not always the same **-** Undifferentiated or anaplastic tumours.

- **Atypical**
  - Abnormal behaviour (Autonomy) **-** Escaping from normal control of cell growth.
  - Arrangement of cells.

Definition

- A tumour is an abnormal mass of tissue, the growth of which exceeds and is uncoordinated with that of normal tissue and persists in the same excessive manner after cessation of the stimuli which evoked the change.

  - Willis.

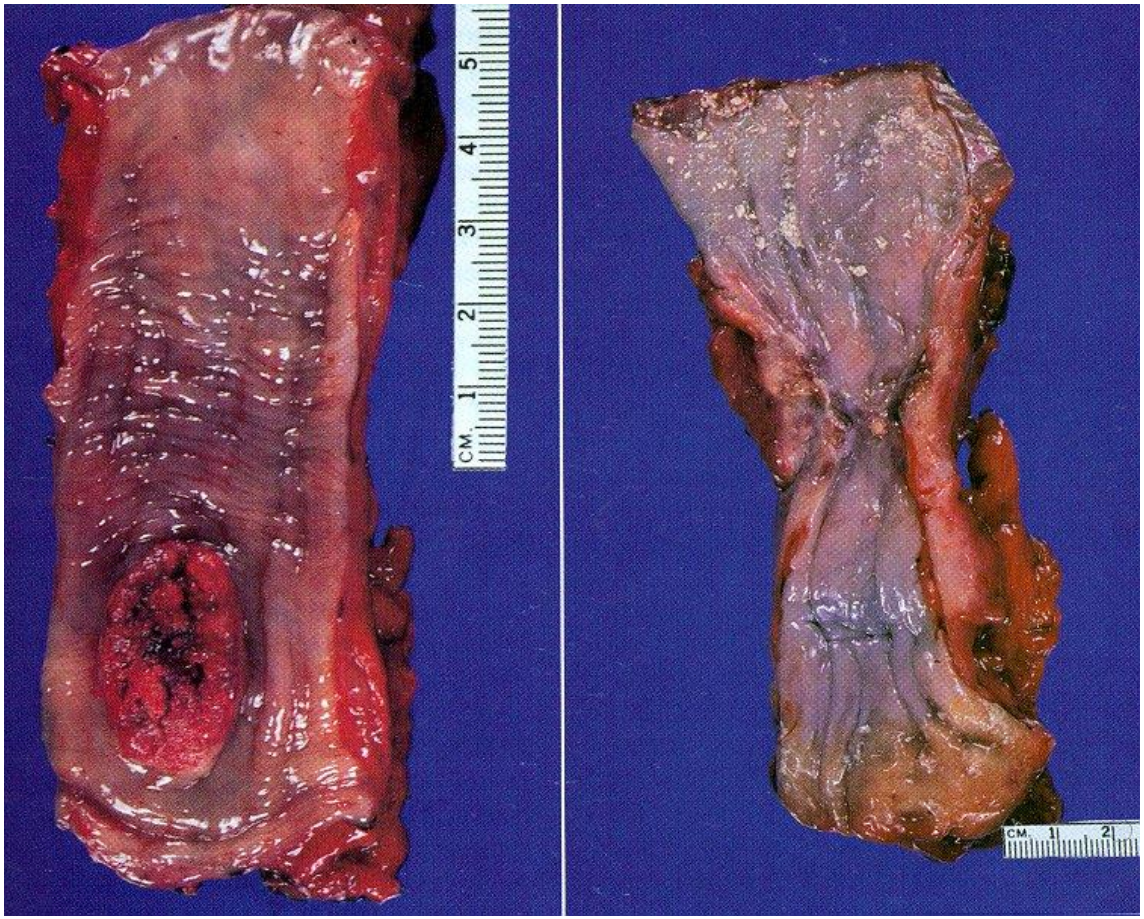
Classification

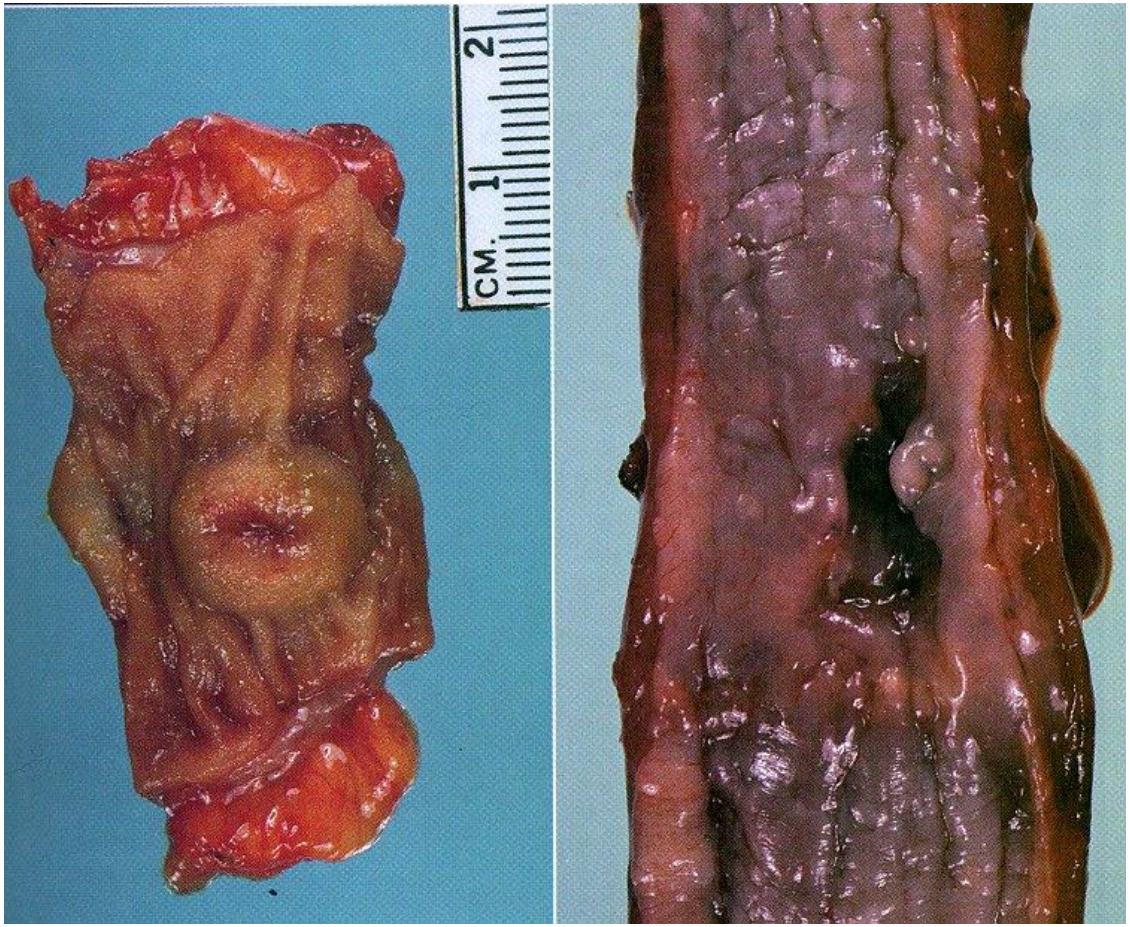
- Macroscopic / Regional
- Histogenic / Embryological
- Histological
- Behavioural
- Aetiological
- Functional
- Genetic - Eg: Lymphomas

Macroscopic (naked eye appearance

- Annular - constrictive
- Fungating - Cauliflower - like
- Ulcerative
- Scirrhous tumours - hard, marked fibrosis
- Medullary (Encephaloid) - soft, brain like, sparse fibrosis.
- Mucoid

Macroscopic Appearances

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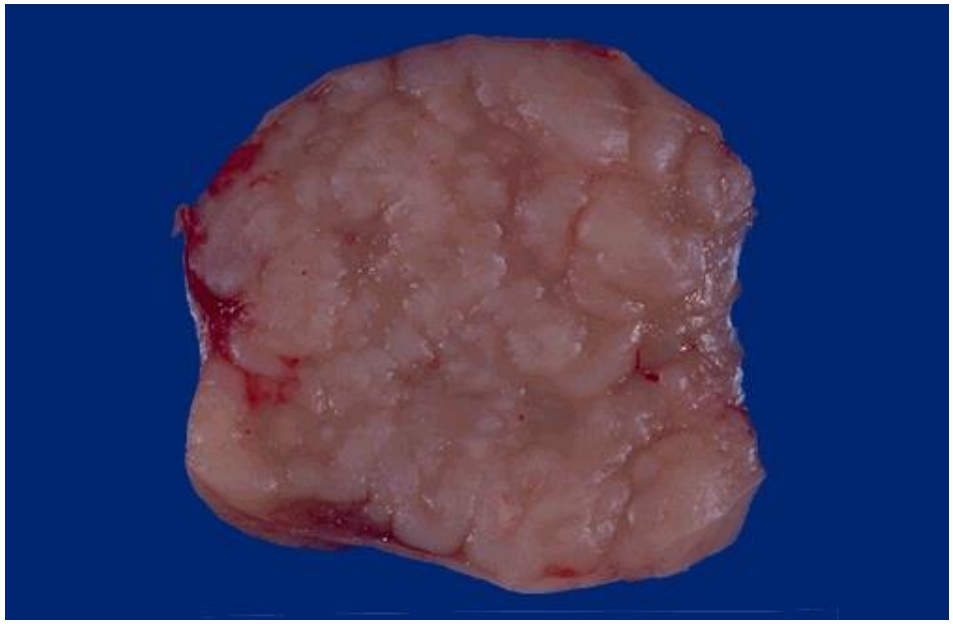
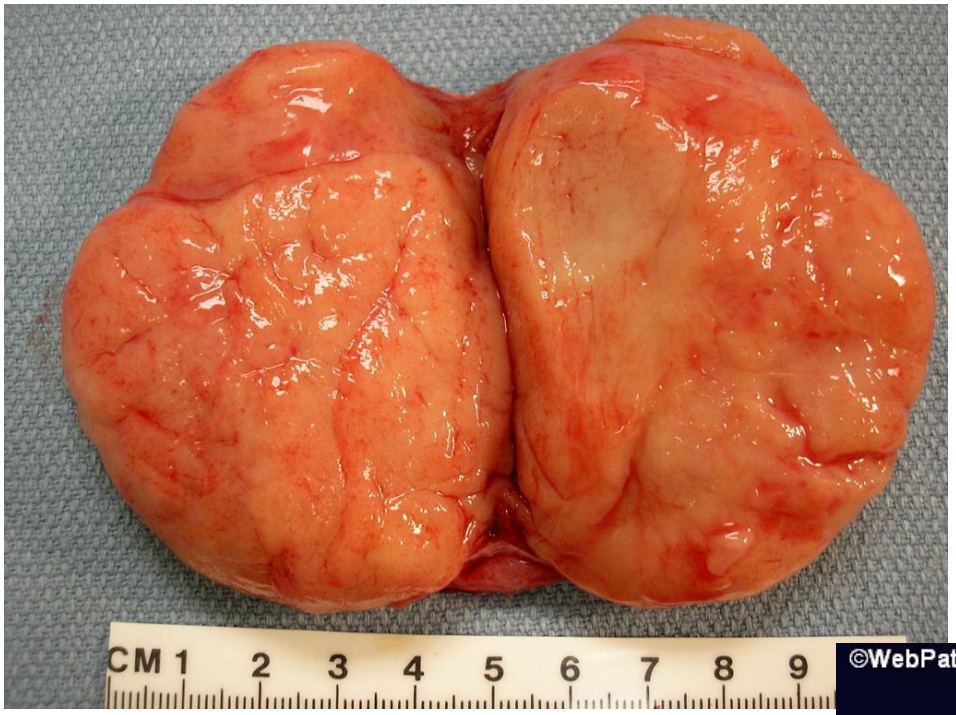


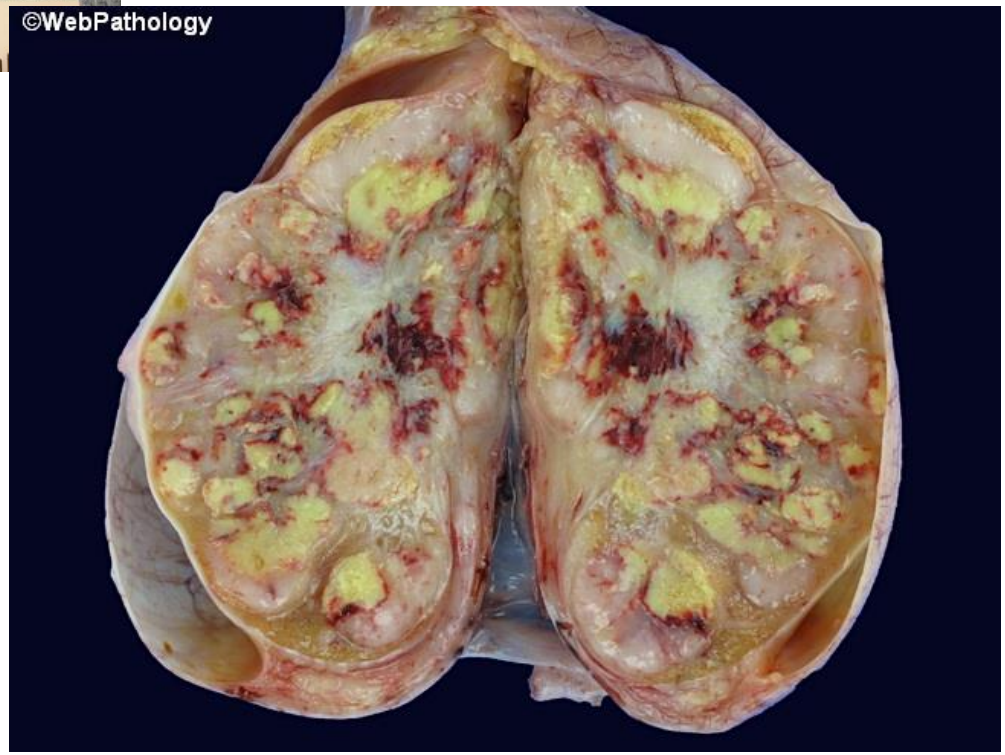
Mucoid tumour

Scirrhous tumour



Fleshy homogenous cut surface of a seminoma

Variegated appearance with whitish haemorrhagic and yellowish areas



How would you describe the cut surface of this tumour ?

Regional (organ of origin)

- Sometimes difficult to decide which the primary site is as there are
  - overlaps in histological appearances.
  - Metastases

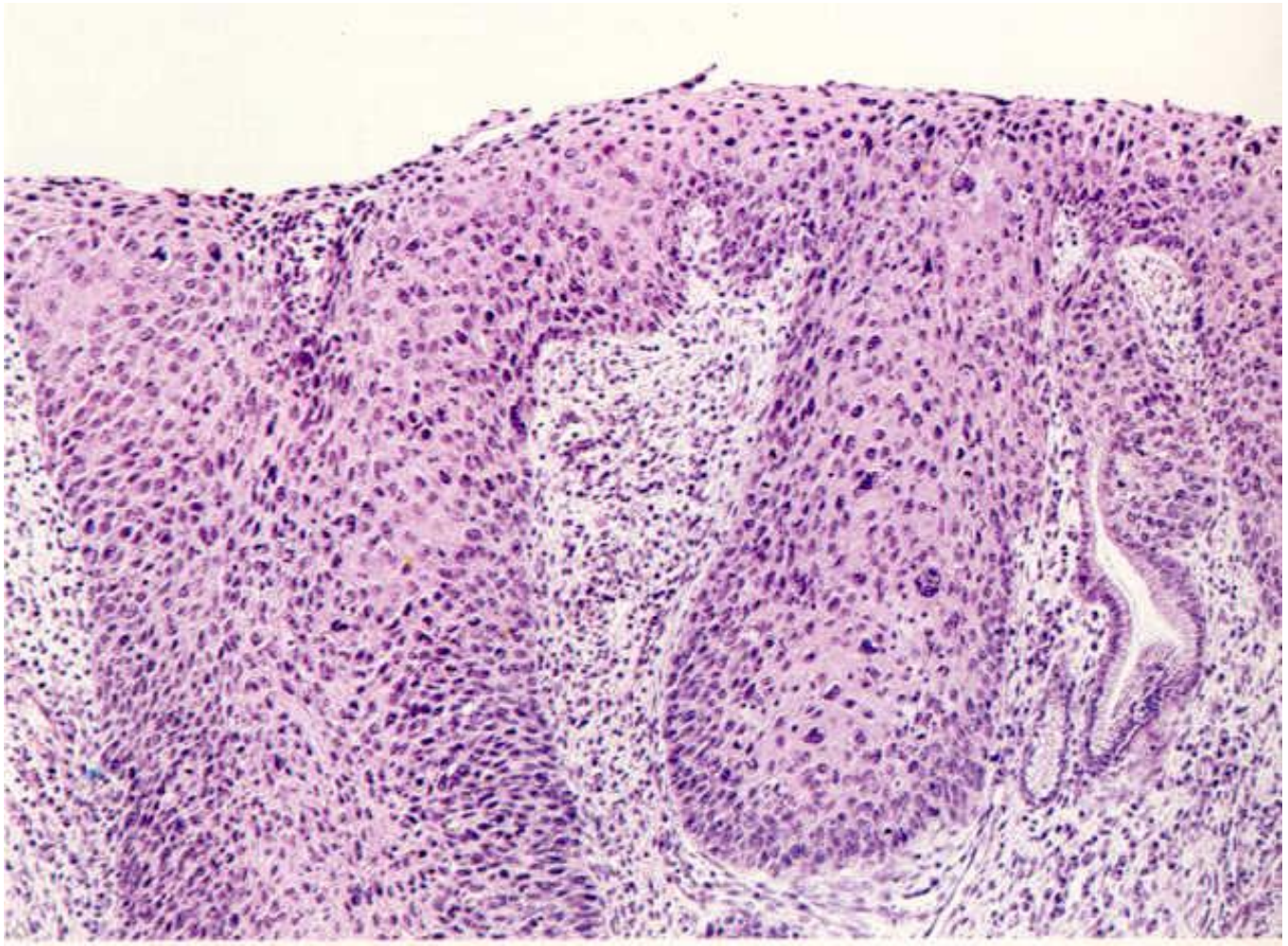
Behaviour

- Benign tumours
- Malignant tumours
- Indeterminate tumors - tumors with erratic behaviour
  - Locally malignant - Basal cell carcinoma
    Ameloblastoma
- Latent carcinoma
  - Histological characteristics of a carcinoma but remain clinically silent. Eg: Ca prostate

Behaviour

- Carcinoma in- situ
  - **Severe dysplasia**
  - No invasion of underlying stroma / breach of the basement membrane
  - Eg: CIN III
    Bowen's disease

Severe dysplasia or Carcinoma in situ of the cervix



Histogenetic Classification

- Based on the cell of origin

- Epithelial origin **- CARCINOMAS**
- Connective tissue origin **- SARCOMA**

Difficulties of a histogenetic Classification

- 1. Nature of endothelium, mesothelium and synovium debatable.
  - (considered Connective tissue but gives rise to Tumours resmbling adenocarcinoma)
- 2.Poorly differentiated tumors
- 3.Tumor metaplasia -
  - Lung (both adeno and squamous components)

Difficulties of a histogenetic Classification

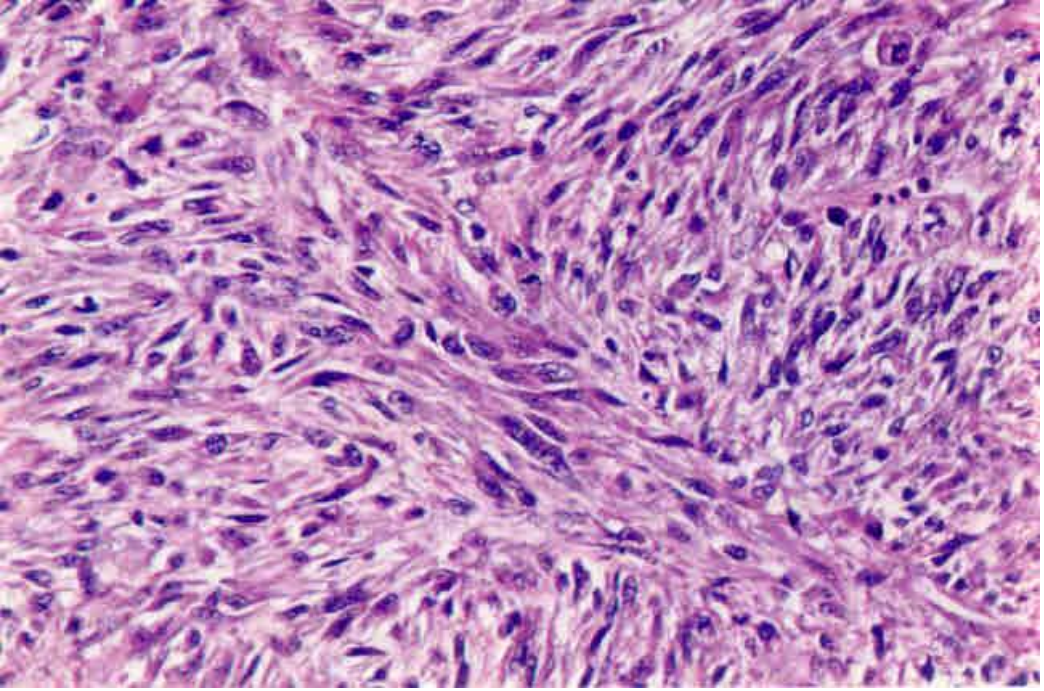
- Debatable origin of tissue
  - Melanocytes (skin) - Epithelial origin (melanocarcinoma) / Neural origin (Melanosarcoma)
- Origin from highly specialized tissue -
  Eg: Lymphoma is not regarded as a Sarcoma

Difficulties of a histogenetic Classification

- **Origin from embryonic tissue -**
  - Pluripotential cells- Primitive cells pertaining to the organ (blastomas) and additional tissue (Eg: skeletal muscle in Wilm's tumour)
  - Germ cells (totipotential cells) - Teratoma
  - Placental tissue - H mole, Choriocarcinoma

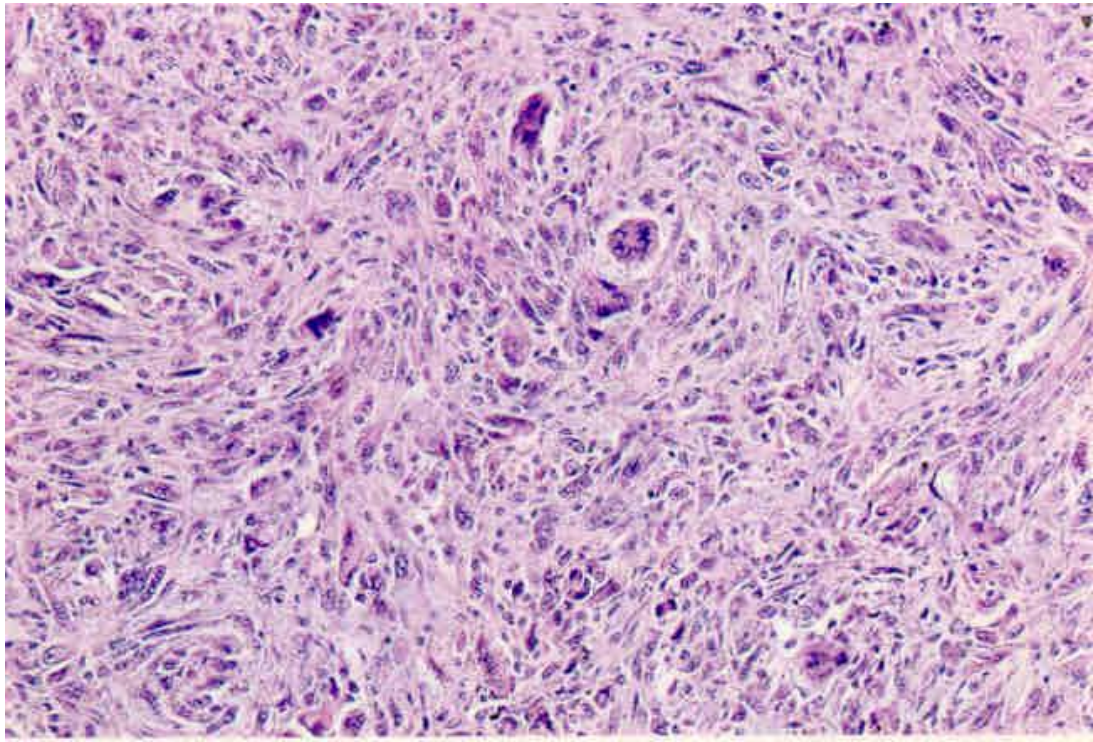
Histological classification

- Difficulties when the tumor is so undifferentiated and defies recognition of the site of origin.
  - Small cell carcinoma
  - Large cell carcinoma
  - Giant cell carcinoma
  - Spindle cell sarcoma / carcinoma (Tumour)



Spindle cell carcinoma

Giant cell cell carcinoma



Functional classification

- Based on the production of hormones leading to pathological and clinical changes.
  - Insulinoma
  - Glucagonoma

- But most tumours are non - functional

Aetiological classification

- Impractical / useless at the moment.
- Because -
  - Aetiology of most tumours are not known.
  - Single agent / factor can give rise to several different tumors.

    Eg: Radiotherapy - Skin Ca
    Osteosarcoma
    Leukaemia.

Genetic classification

- Used in lymphomas and some soft tissue tumours.
- The future ???

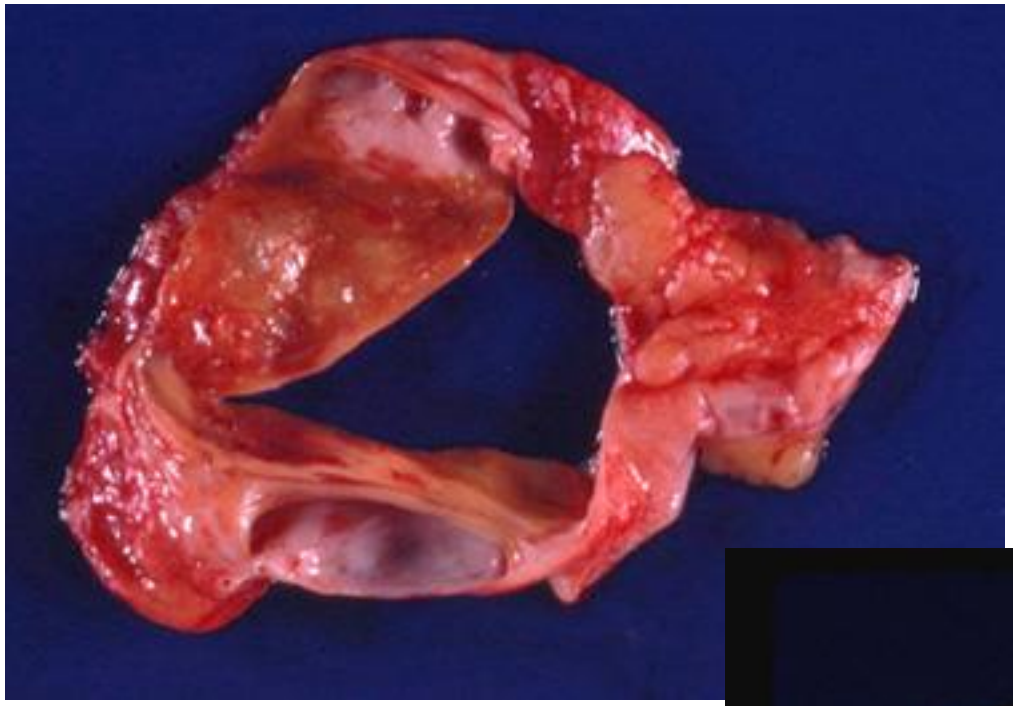
Nomenclature - Benign

- Benign tumors - suffix ‘OMA’
- **ADENOMA -** Benign epithelial tumour of glandular origin
- **PAPILLOMA -** Benign epithelial tumor producing macroscopic / microscopic appearance of warty - finger like projections.

Nomenclature - Benign

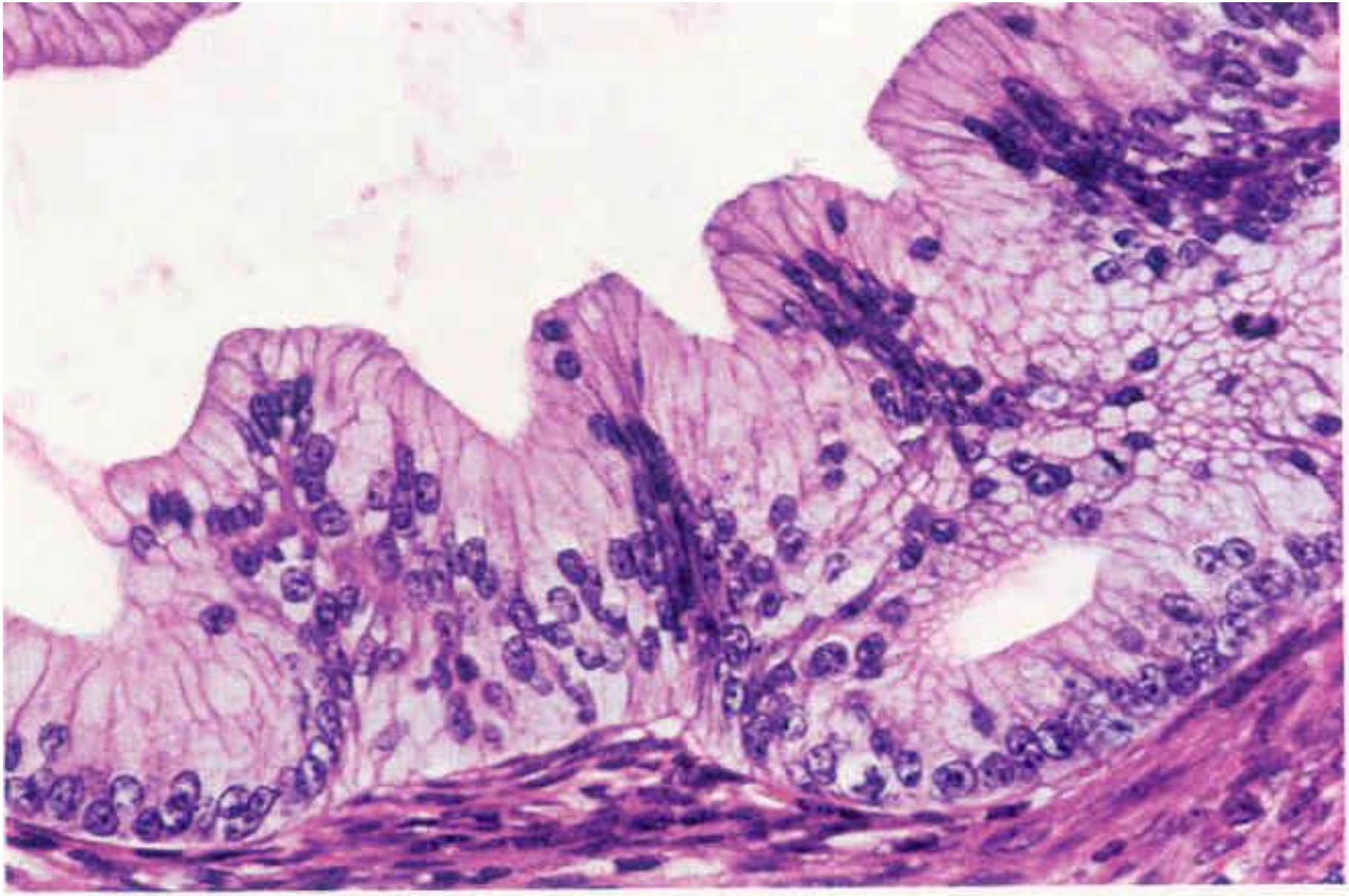
- **Cystadenoma -** adenoma forming cystic masses
- **Papillary cystadenoma -** papillary projections into cystic spaces.
  - (Papillae - finger - like projections with a connective tissue core covered by epithelia)
- **Polyp -** Macroscopically visible projections above mucosal / epithelial surfaces. Restricted to benign lesions but polyps may be malignant.

POLYPS IN THE COLON

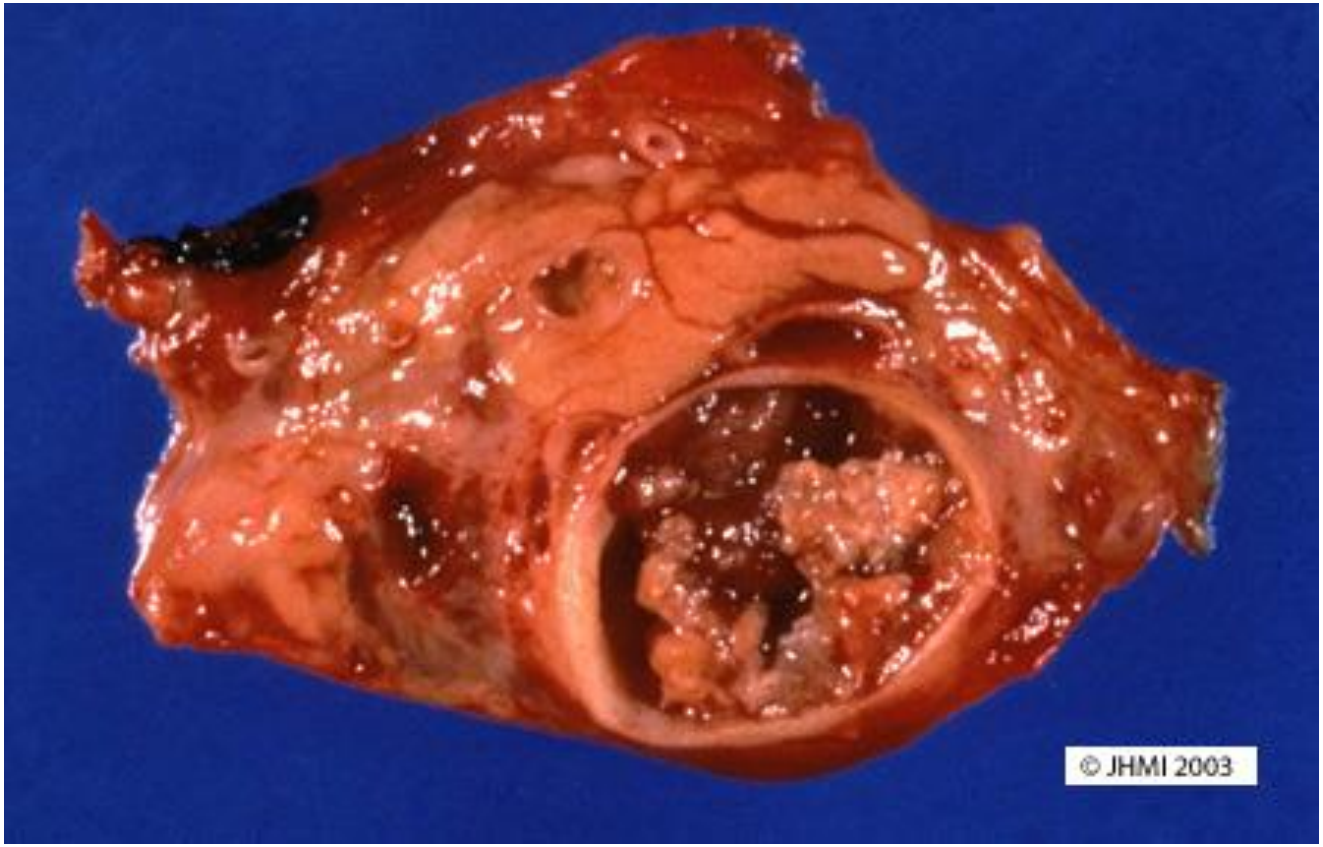


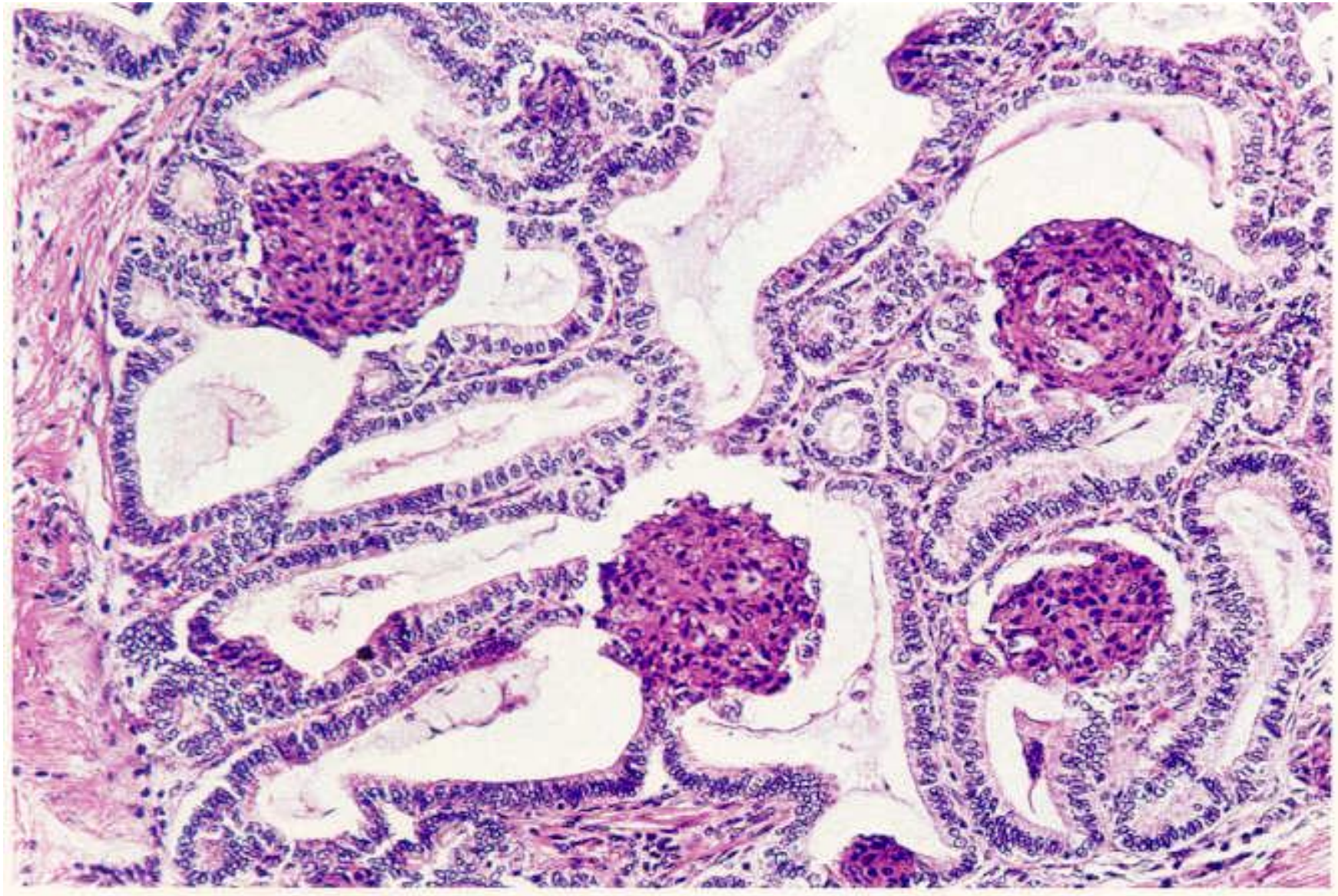
Mucinous cystadenoma

Mucinous cystic neoplasm



Papillary cystic neoplasm – papillary projections





Nomenclature - Malignant

- Epithelial origin **- CARCINOMAS**

- Connective tissue origin **- SARCOMA**

Mixed tumour

- Containing both epithelial and connective tissue elements (biphasic)
  - Pleomorphic adenoma (salivary gland)
  - Teratoma
  - Synovial sarcoma
  - Mixed mullerian tumors of the female genital tract
  - Mesothelioma

Inappropriate use of the suffix “OMA”

- Melanoma
- Hepatoma *
- Glioma
- Teratomas
- Lymphoma
- Haematoma
- Choristoma / Harmatoma

Tumour - like conditions

- **Choristoma**
  - Microscopically normal cells or tissues that are present in abnormal locations.
    Eg: rests of pancreatic tissue found in stomach, small intestines
    a small mass of adrenal cells found in the kidneys lungs, ovary or elsewhere.

Tumour - like conditions

- **Harmatoma**
  - An excessive focal overgrowth of mature normal and tissue in an organ composed of identical cellular elements.
  - The architectural pattern / organization of these tissue elements is aberrant.

    Eg: Haemangioma
    Lymphangioma
    Osteochondroma
    Rhabdomyomas of the heart
    Bile duct adenoma
  -