NEOPLASIA
(Malignant tumors)

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Outlines

By the end of this lecture; the students should learn the following:

- Main features of malignant tumors
- Main differences between carcinoma and sarcoma
- Classification of malignant tumors with examples.
- Definition, sites and morphology of squamous cells carcinoma
- Definition, sites and features of transitional cell carcinoma
- Definition, sites, types and morphology of adenocarcinoma
- Definition, sites and main features of liposarcoma and leiomyosarcoma

Features and classification of MALIGNANT TUMOURS

Features and classification

Definition:

Variably differentiated neoplasms that tend to grow rapidly, often metastasize, and frequently causes death of the host

Main features:

- Rapid rate of growth
- Grow by invasion of surrounding structure
- Infiltrate and destroy nearby structures
- Frequently metastasise to distant organs
- Commonly recur after removal.

Features and classification

Types of malignant tumors:

A. **Carcinoma**: ***malignant tumor of epithelial tissue***

B. **Sarcoma**: ***malignant tumor of mesenchymal tissue***

Features and classification

	Carcinoma	Sarcoma
Definition	Malignant tumor of epithelial tissue	Malignant tumor of mesenchymal tissue
Incidence -Frequency -Age	 -More frequent -Mostly affect old age	 -Less common -Common in younger age
Growth rate	Slower than sarcoma	Rapidly growing
Grossly -size -shape -consistency -colour	 -smaller than sarcoma -irregular solid mass, ulcer, cauliflower or annular mass. -mostly hard -greyish white	 -usually large mass -bulky mass, less commonly ulcer or cauliflower mass -mostly soft and fleshy -pink (highly vascular)

Features and classification

	Carcinoma	Sarcoma
Microscopically		
• Pattern of growth	•Cells arrange in sheets, nests, acini, cords	•Cells arrange singly
• Cell cohesion	• Preserved	•Lack of cohesion
• Cellular anaplasia	• Less marked than in sarcoma	•Usually prominent
• Stroma	• Desmoplastic stroma between cell groups.	•Scanty stroma between single cells
• Tumor vascularity	• Less marked than in sarcoma	•Prominent; with thin walled vessels
• Hemorrhage and necrosis	• Less common than in sarcoma	•Frequently observed

Features and classification

	Carcinoma	Sarcoma
Spread	• Slower than sarcoma • Mainly by lymphatics	• Faster than carcinoma • Mainly by blood
Types	1. Surface epithelium: as ▪ Squamous cell carcinoma ▪ Transitional cell carcinoma 1. Glandular epithelium as ▪ adenocarcinoma	1. Differentiated sarcoma: based on cell of origin as: fibrosarcoma, chondrosarcoma, osteosarcoma, liposarcoma, leiomyosarcoma and rhabdomyosarcoma 2. Undifferntiated sarcoma: is described according to cell shape as spindle cell sarcoma and round cell sarcoma
Prognosis	Better than sarcoma	Usually worse than carcinoma

Features and classification

Common examples for malignant tumors

Malignant tumors

Carcinoma

Surface epithelium:

- Squamous cell carcinoma
- Transitional cell carcinoma

Glandular epithelium:

- Adeno-carcinoma

Sarcoma

- Bone: Ostesarcoma
- Cartilage: Chondrosarcoma
- Fat: Liposarcoma
- Muscles: Leiomyosarcoma
- Blood vessels: Angiosarcoma
- Fibrous tissue: Fibrosarcoma

Examples for carcinoma

- Squamous cell carcinoma
- Transitional cell carcinoma
- Adenocarcinoma

Examples for carcinoma

Squamous cell carcinoma (Sq. CC)

- **Def.:** malignant tumor of squamous epithelium.
- **Sites:**
  - Site normally covered by squamous epithelium as skin, oral cavity, esophagus, larynx, cervix, vagina, anal canal
  - Other types of epithelia as lining of urinary bladder, bronchi and gall bladder after squamous metaplasia.
- **Predisposing factors:**
  - Exposure to sunlight
  - Exposure to irradiation
  - Chronic irritation as in urinary bilharziasis, renal stones, gall stones and chronic smoking

Malignant tumours

- **Grossly:**
  - Cauliflower or fungating mass (exophytic type)
  - Malignant ulcer ***(with raised everted edge, indurated base, necrotic floor)***
  - Infiltrating tumor (endophytic type).

Fungating mass

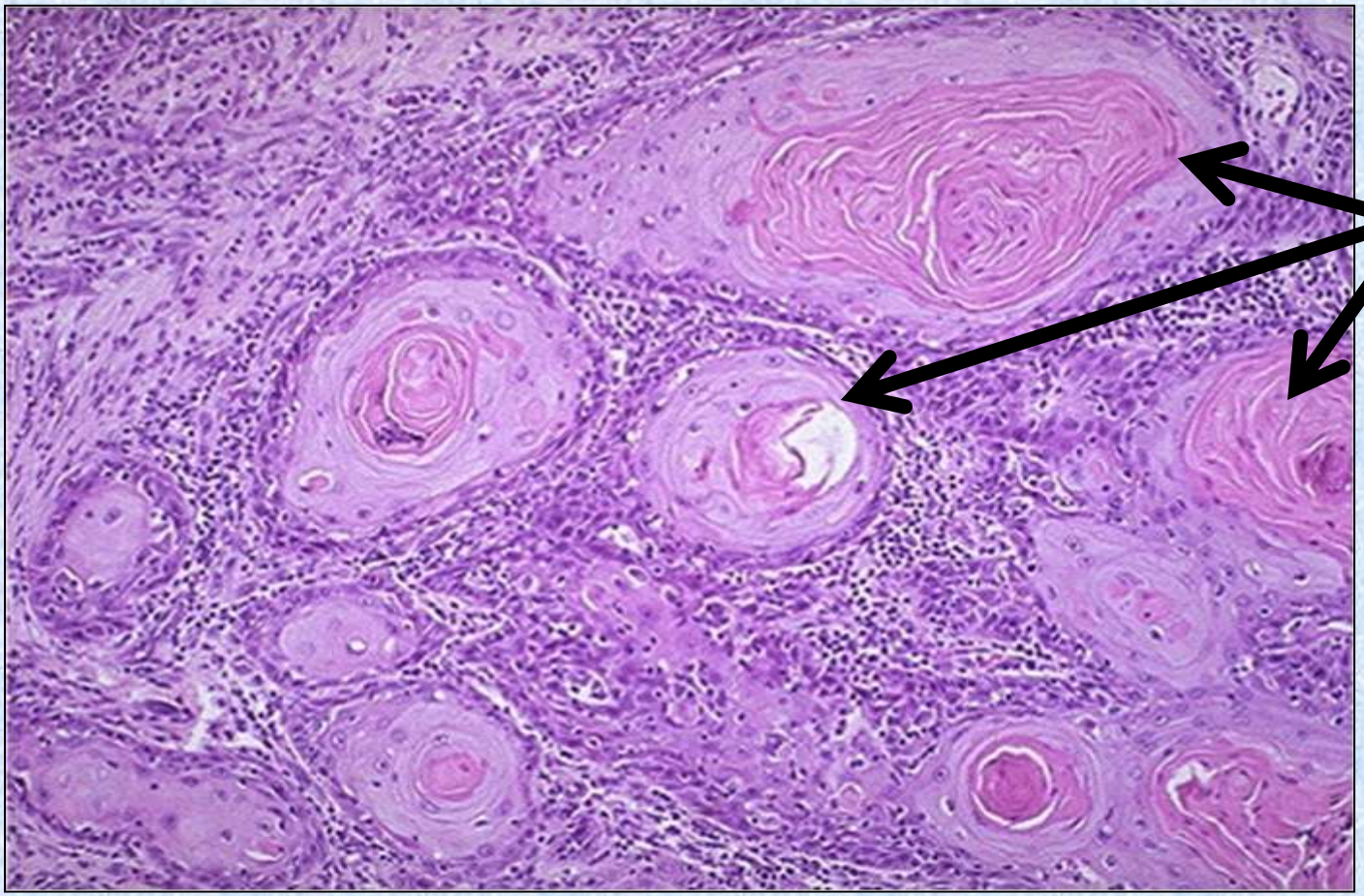
Malignant ulcer

Malignant tumours

- **MP**:
  - Infiltration by atypical squamous cells that show features of malignancy (**mention**)
  - The cells arrange in variable-sized sheets that form cell nests which is the diagnostic feature of Sq. CC.
  - Cell nests show same layers as normal epidermis with basal layer at periphery, followed by prickle cell layer and keratin at the center.
  - Cell nests are numerous in well-differentiated tumors; few in less differentiated tumors and absent in undifferentiated tumors.
  - The cell nests are separated by vascular CT stroma with variable lymphocytic infiltrate.

Malignant tumours

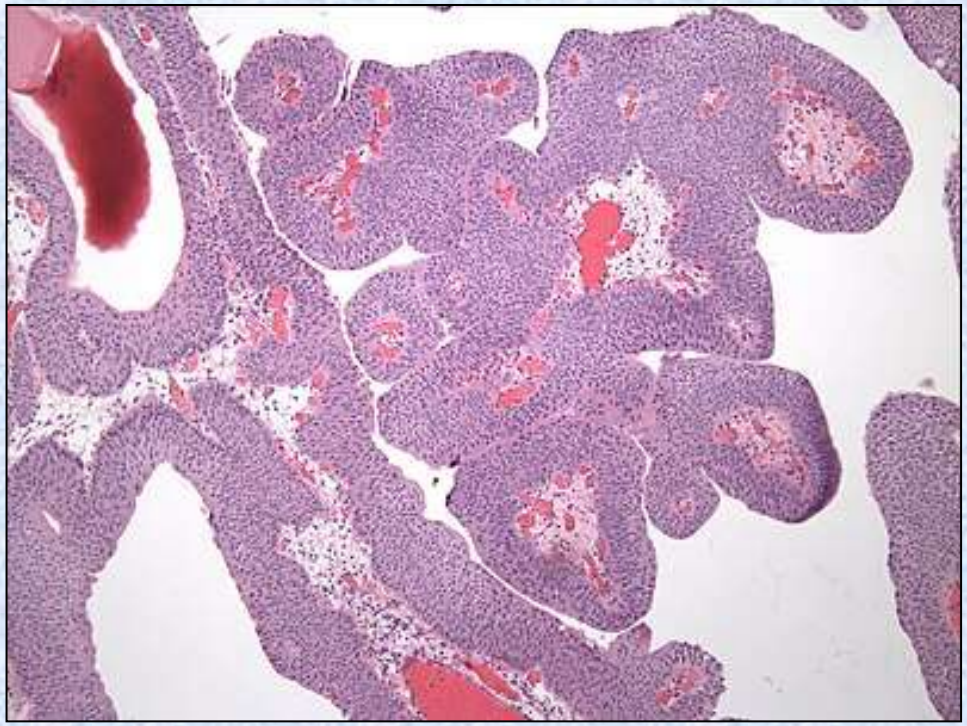
- **MP**:



Examples for carcinoma

Transitional cell carcinoma (TCC)

- **Def.:** malignant tumor of transitional epithelium.
- **Sites:** All sites of transitional epithelium including urinary bladder, ureter and renal pelvis
- **Gross:** papillary mass, cauliflower mass and malignant ulcer.
- **MP:** complex branching papillary structures with vascular cores covered by several layers of malignant transitional cells that show criteria of malignancy (***describe***).



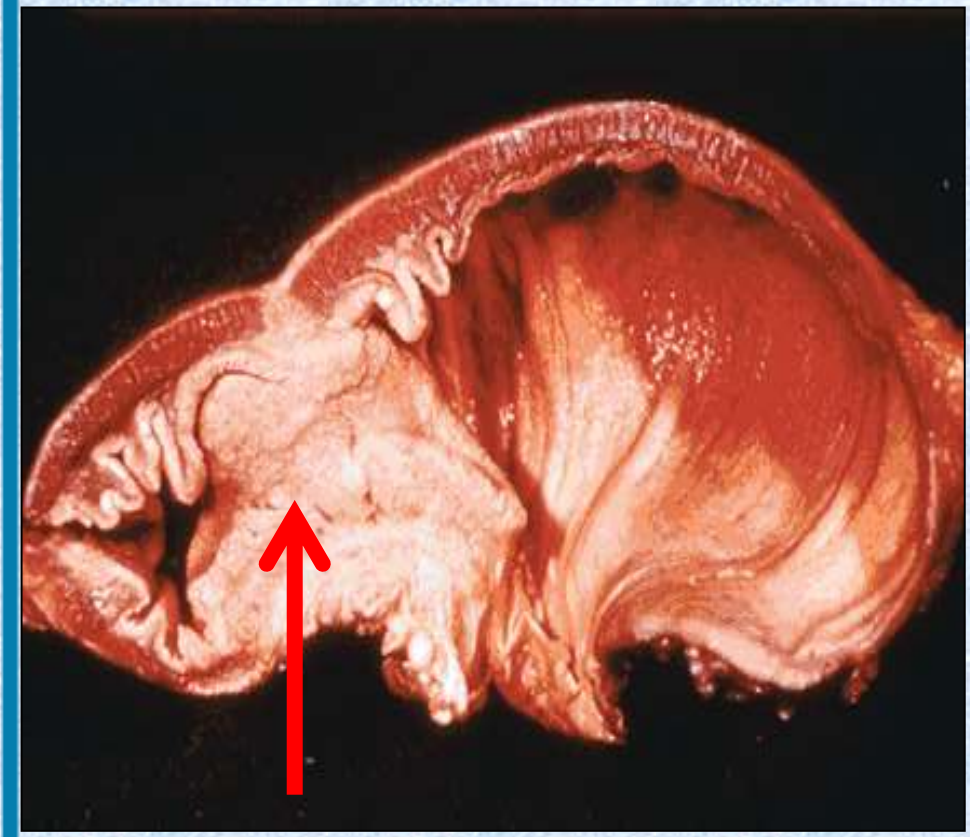
Malignant tumours

Carcinoma of glandular epithelium

- **Sites:**
  - Lining glands of GIT, gall bladder, endometrium, cervix
  - Endocrine glands as thyroid, pancreas, ovary and adrenals
  - Exocrine glands as breast, sebaceous glands and salivary glands
- **Grossly:**
  - Tumors of solid organs appear as a malignant mass (describe).
  - Tumors of surface epithelium appear as
    - Fungating cauliflower mass (**describe**)
    - Malignant ulcer (**describe**)
    - Annular mass: thickening of the wall and narrowing of the lumen

Malignant tumours

- **Grossly:**



Annular tumor mass obstructing colon lumen

Fungating mass of stomach

Malignant tumours

- **Microscopic types:**

1. **Adenocarcinoma:**
   - Malignant tumor in which the cells form glands of variable size and shape, lined by one or multiple layers of malignant cells
   - The glands infiltrate submucosa, musculosa or extend to serosa
   - The cells lining of the glands show features of malignancy (**describe**)
   - Areas of hemorrhage and necrosis may be detected

2. **Mucinous carcinoma**
   - Tumor cells induce excess mucin production.
   - Intact or fragmented glands float in lakes of mucin.
   - The cells show features of malignancy (**describe**)
   - Stroma of the tumor is formed mainly by pale blue mucinous material

Malignant tumours

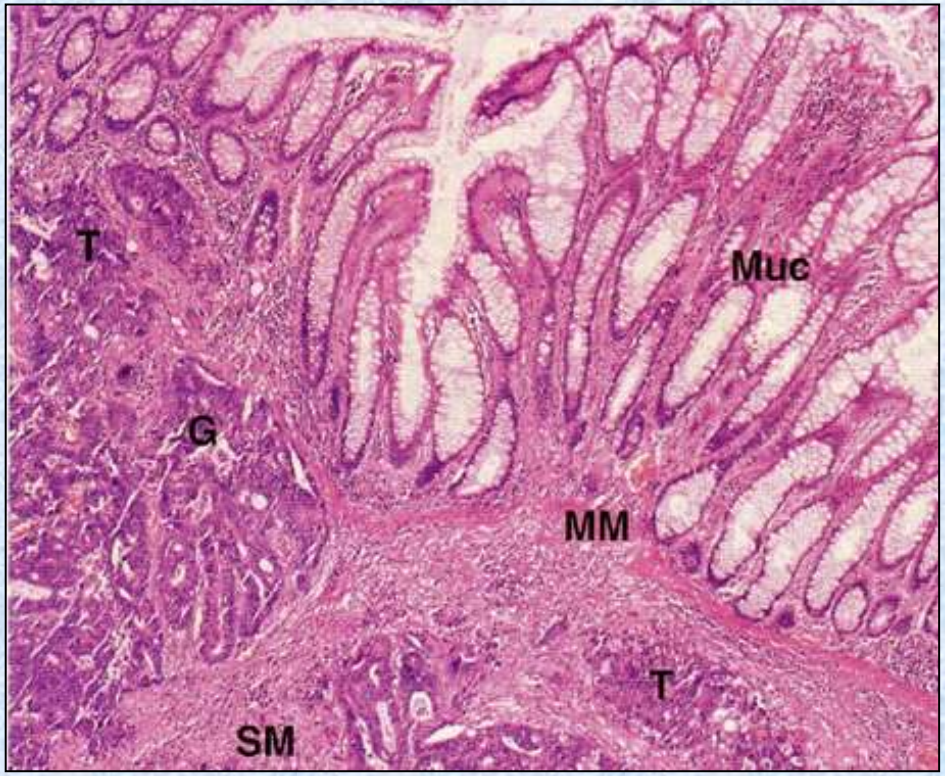
- **Microscopic types:**

3. **Signet ring cell carcinoma**
   - Tumor tissue is formed of signet ring cells with focal mucinous stroma

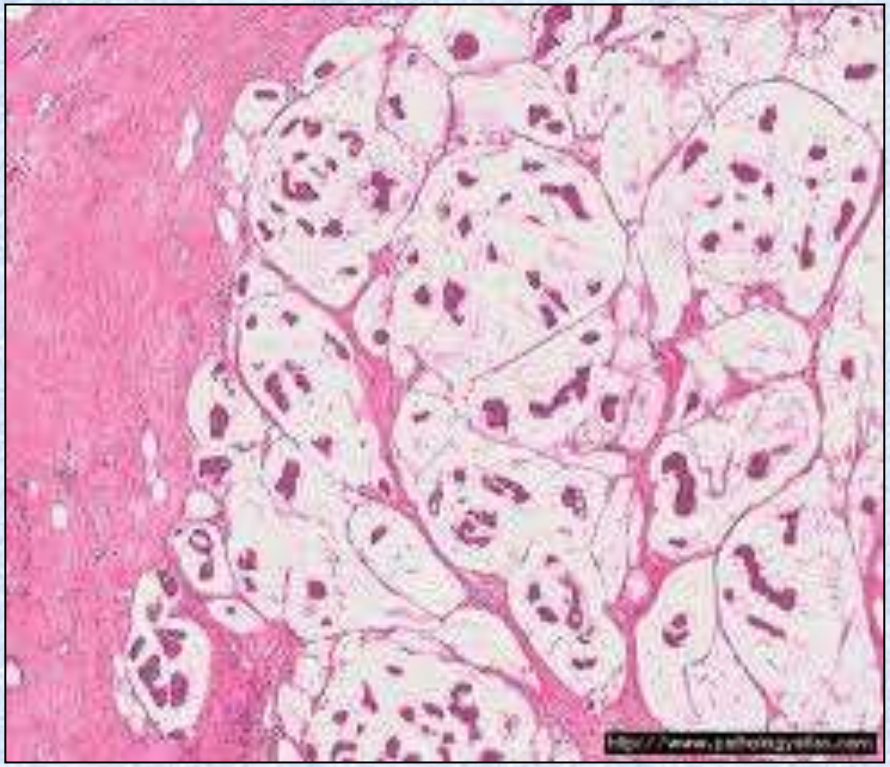
4. **Undifferentiated carcinoma (carcinoma simplex):**
   - The tumor cells fail to form glands or produce mucin.
   - Tumor cells arrange in solid groups separated by connective tissue stroma.
   - Common sites are breast, prostate and kidney

Malignant tumours

- **Microscopic types:**



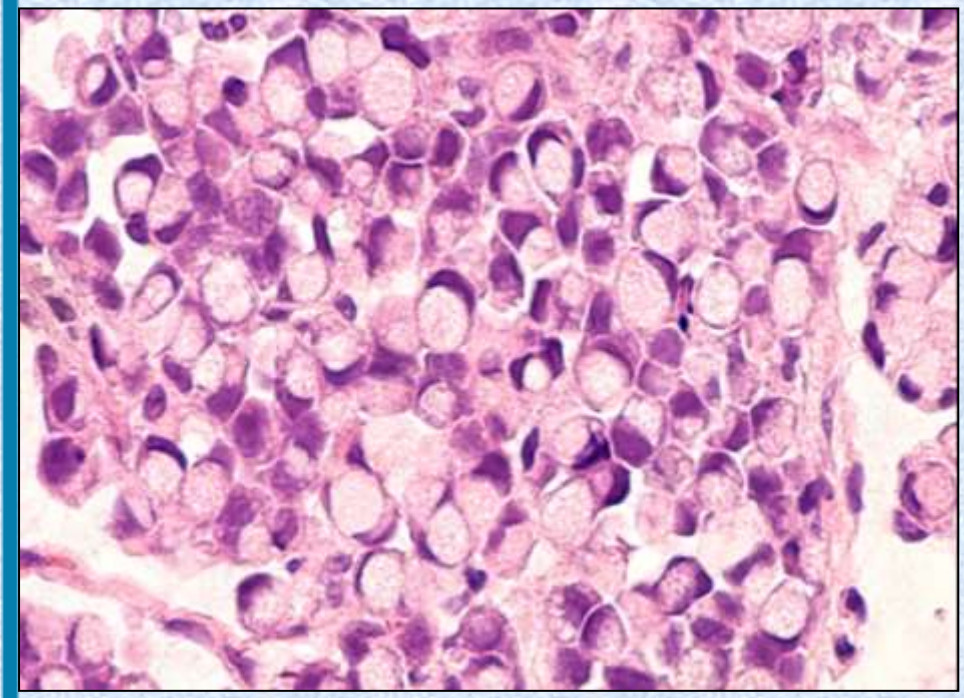
Adenocarcinoma



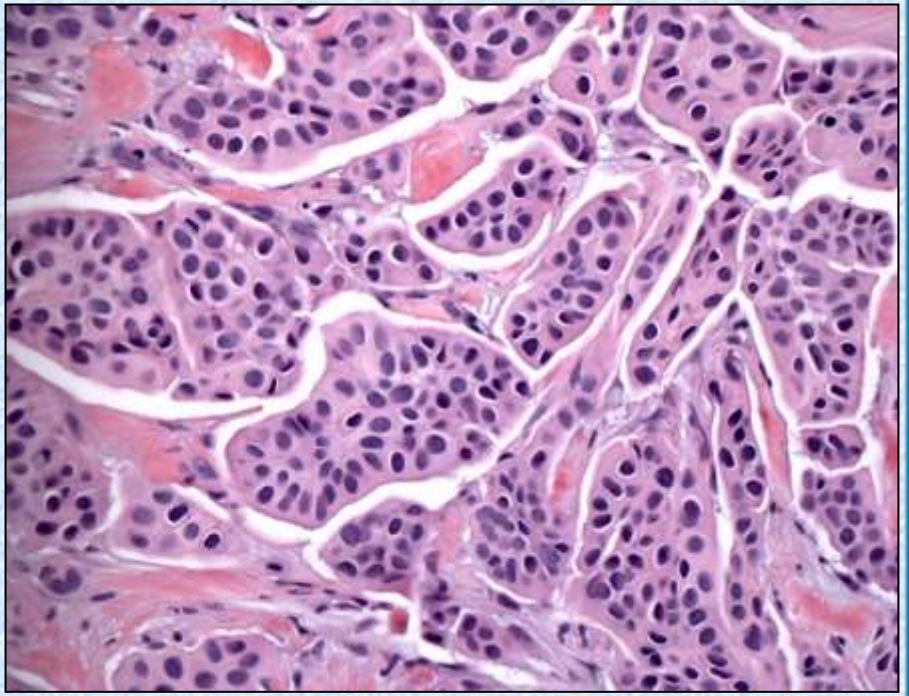
Mucinous carcinoma

Malignant tumours

- **Microscopic types:**



Signet ring cell carcinoma



Undifferentiated carcinoma

Examples for sarcoma

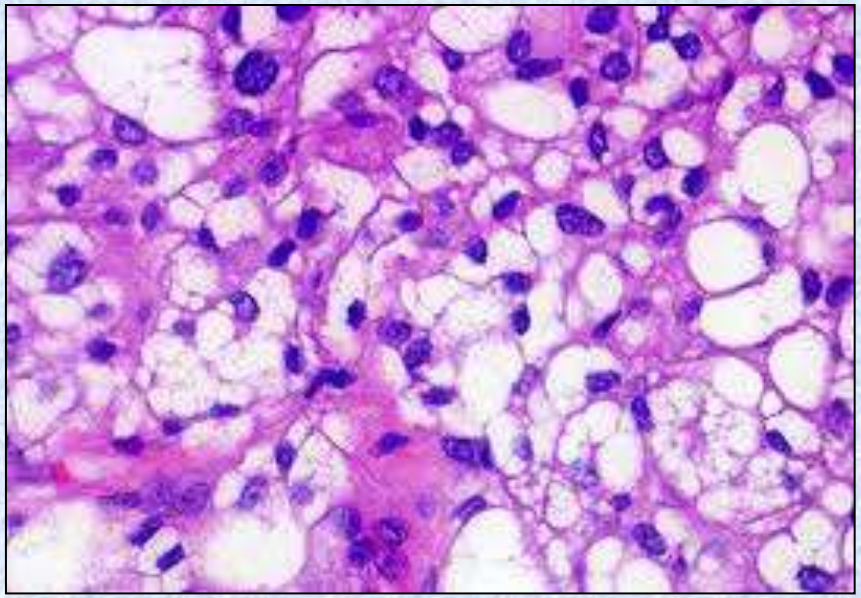
- Liposarcoma
- Leiomyosarcoma

Malignant tumours

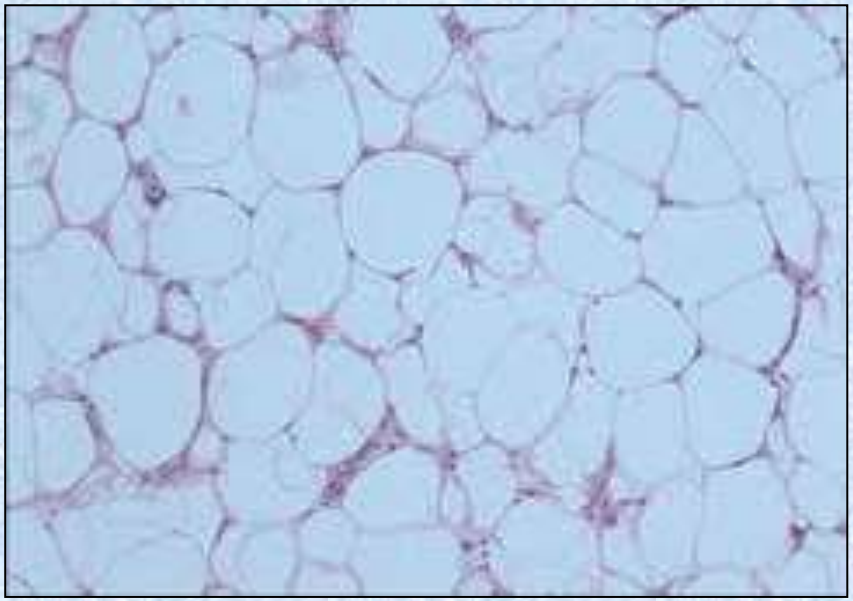
Liposarcoma

- **Def**.: common malignant mesenchymal tumor of fatty tissue
- **Sites**: deep subcutaneous fatty tissue, retroperitoneal and inter-muscular fat
- **Grossly**: large, non-capsulated, yellowish, fleshy mass of soft consistency and infiltrating margins tumor.
- **MP**:
  - Groups of spindle or oval-shaped cells which show features of malignancy **(describe)**
  - Characteristically, there are signet ring cells with vacuolated cytoplasm that contain fat globules.
  - Vascular stroma with myxoid change

Malignant tumours



Liposarcoma

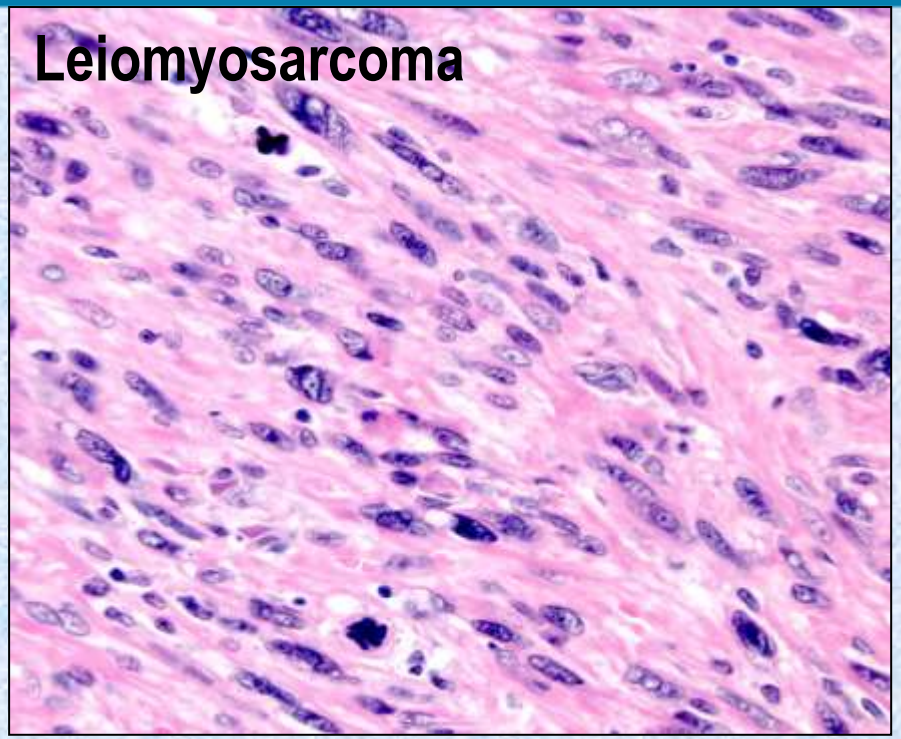


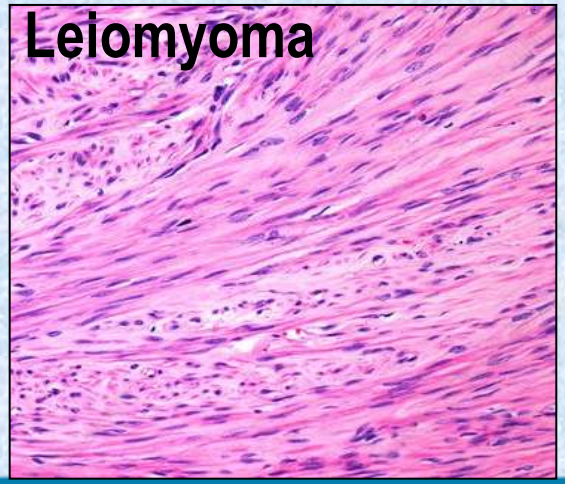
Lipoma

Malignant tumours

Leiomyosarcoma

- ***Definition:*** It is a malignant tumor of smooth muscles.
- ***Sites:*** Smooth muscles especially the uterus and on top of leiomyoma.
- ***Grossly:*** large soft fleshy mass with areas of hemorrhage and necrosis.
- ***MP:*** malignant spindle cells arranged in bundles. The cells show features of malignancy (**describe**)





Good luck