Neoplasia

Neoplasia

- Neoplasia = new growth
- Neoplasm = tumor
- Tumor = swelling
- The study of tumors = Oncology
  - Oncos = tumor + ology = study of

Neoplasia

Definition:

It is a mass of tissue formed as a result of abnormal, excessive, uncoordinated, autonomous and purposeless proliferation of cells.

Differences between hyperplasia and neoplasia

Criteria	Hyperplasia	Neoplasia
1- Effect	Usually has no function	Harmful
2- Stimulus	Excited by a stimulus	Independent of a stimulus
3- character	Limited, reversible on removal of the stimulus	Not limited. Irreversible
4- characters of cells	Cells are normal in shape and pattern	Cells are abnormal in shape and pattern

Classification of the tumours:

According to their behavior :

1- Benign tumour

2- Malignant tumour

3- Locally malignant

According to tissue of origin:

1- Epithelial

2- Mesenchymal

3- Others

Neoplasia

All tumors have two basic components

Parechyma: made up of neoplastic cells

Stroma: made up of non-neoplastic, host-derived connective tissue and blood vessels

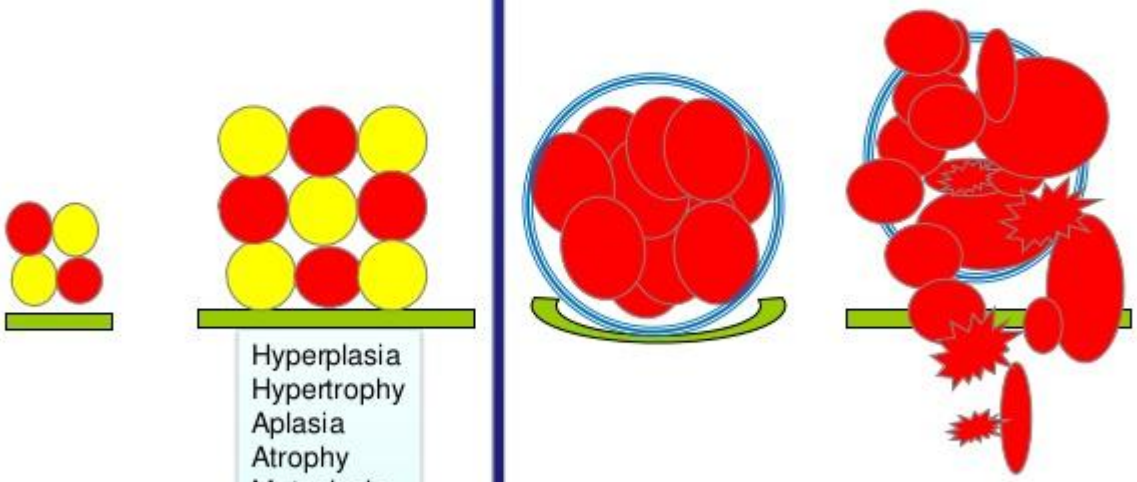
The parenchyma:
Determines the biological behavior of the tumor
From which the tumor derives its name

The stroma:
Carries the blood supply
Provides support for the growth of the parenchyma

Growth Disorders:

Non neoplastic
(Polyclonal)

Neoplastic
(Monoclonal)



Hyperplasia
Hypertrophy
Aplasia
Atrophy
Metaplasia
Dysplasia

Normal | Adaptation | Benign | Malignant

Criteria	**Benign tumours**	**Malignant Tumours**
1-Rate of growth	slow.	rapid.
2- Mode of growth.	Expansile i.e compressing the surrounding tissues without invasion.	Invasive, i.e infilterating and destroying the surrounding normal tissues..

C-in a solid organ it appears rounded with capsule	C- in solid organ appears as an irregular mass.
d. When the tumour arises from surface epithelia it forms a polyp (papilloma).	d. Tumours arising from surface epithelia appears : * - fungating cauliflower-masses * -Ulcerative pattern The ulcer is irregular, with raised everted edges, rough necrotic floor & indurated base fixed to the surrounding tissue due to infiltration. - infilterative growth below the surface. In tubular organs as intestine.

3- Microscopic picture	the cells are perfectly differentiated i.e closely mimic the normal cells. Rare mitoses.	a. Cellular Anaplasia characterized by : 1-Cellular and NuclearPleomorphism: 3-Nuclear enlargement and hyperchromatism: 4- Nucleoli may be prominent. 5-Abnormal mitoses (e.g tripolar spindles).

4-Metastases	No metastases	Sends metastases.
5-Prognosis	a.don't recur if well excised. c. are not dangerous unless: -They arise in vital organs as the brain. -They arise in hollow organs (as intestine causing obstruction). -They produce hormones as in tumours of endocrine glands. -They may change malignant	b. Recurrence is very common. c. Malignant tumours are serious & cause death due to: 1. Local organ destruction due to direct spread. 2. Destruction of distant organs by metastases (distant spread). 3.Malnutrition due to : *Loss of appetite. 4. Chronic toxemia due to secondary bacterial infection. 5. Anaemia is common due to several causes including: *Recurrent hemorrages from the tumour. *Bone marrow destruction by metastases. 6. Cachexia This is marked wasting & weakness (due to anemia, toxemia, malnutrition, organ failure) .

Neoplasia

- **Nomenclature**
  - Benign tumors:
    - prefix + suffix
    - Type of cell + (-oma)

Neoplasms Nomenclature:

Oma - Tumour
Carcin-oma – Hard Tumour
Sarc-oma - Soft Tumour

Cell of Origin	Benign	Malignant
• Gland. Epithelium	• Adenoma -	Adencarcinoma
• Lining. Epithelium	• Papilloma -	Squamous cell ca.
• Fibroblast	• Fibroma -	Fibrosarcoma
• Osteoblast	• Osteoma -	Osteosarcoma
• Chondrocyte	• Chondroma	Chondrosarcoma
• Lipocyte	• Lipoma	Liposarcoma
• Smooth muscle	• Leiomyoma	Leiomyosarcoma
• Skeletal muscle	• Rhabdomyoma	Rhabdomyosarcoma

Neoplasia

Exceptions

- Melanoma (skin)
- Mesothelioma (mesothelium)
- Seminoma (testis)
- Lymphoma (lymphoid tissue)

- **Routes oF Spread:**

Spread of tumours calssified into:

I- local spread II- Distant spread

II. Distant spread (Metastasis):

Distant spread can occurs through many routes

1. Lymphatic spread
2. Haematogenous spread
3. Other routes (transcoelomic spread, spread along epithelium-lined surfaces, spread via cerebrospinal fluid, implantation).

1-Local spread

Malignant cells can spread along lines of least resistance.

- Some structures as cartilage , periosteium delay direct spread.

1. **Lymphatic spread:**

- - In general, carcinomas metastasize by lymphatic route while sarcomas favour haematogenous route. also spread by lymphatic pathway.
- cells may detach to form tumour emboli as to be carried along the lymph to the next draining lymph node (Lymph node is enlarged and fixed.

2. blood spread:

- - Metastasis through blood vessels is the common route for sarcomas.
- - The common sites for blood-borne metastasis are the liver, lungs, , brain, bones.

Other routes

1-Transcoelomic spread:

Certain cancers invade through the serosal wall of the coelomic cavity Transcoelomic spread includes:

Transpleural transpericardial spread and - Transperitoneal spread

2-Spread via cerebrospinal fluid

3-Implantation

Rarely, a tumour may spread by implantation by, needles, sutures, or be implanted by direct contact such as transfer of cancer of the lower lip to the apposing upper lip.

Comparison between carcinoma and sarcoma

Criteria	**Carcinoma**	**Sarcoma**
1- Definition	Malignant tumour of epithelium	Malignant tumour of the mesenchyme
2- Incidence	Most common	Less common
3- Growth rate	Rapid but slower than sarcoma	Faster than carcinoma
4- Mode of growth:	More infiltrative	Less infiltrative

5- Gross picture	1- Size: less bulky 2- Haemorrhage and necrosis are less severe 3- Consistency: hard 4- Color; greyish 5- If arise in solid organ: form irregular mass 6- If arise from the surface or hollow organ: ulcerative, fungating and infiltrative pattern.	1- Size: bulky 2- Haemorrhage and necrosis are marked 3- Consistency : soft 4- Color; pink 5- If arise in solid organ: irregular mass 6- Not arise from the surface or hollow organ. It can arise from subepithelial mesenchyme and appear as bulky expansile growth.

6- Terminology:	it is derived from the Greek Carcinos meaning a crab to describe their infiltrative mode.	Sarcoma is derived from the Greek Sarc which means flesh to describe their fleshy consistency.

Thank you