



Pathology

Subject : Neoplasia

Lec no : 22

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وَقُلْ رَبِّ زِدْنِي عِلْمًا

NEOPLASIA



Dr. Ola Abu Al Karsaneh

Nomenclature

ورق

❖ **Neoplasm** = New growth of transformed cells producing a mass.

What are **TRANSFORMED** cells?

- Cells that have undergone **several mutations** leading to features of :

1. Uncontrolled growth →

بنمو بدون أي سيطرة
لاكي
inhibitor

2. Uselessness

3. Persistence

- The growth of the neoplasm **EXCEEDS** that of the normal tissues and **PERSISTS** in the same way even **AFTER REMOVAL** of the stimulus.

له يظلوا ينفون حتى لو حلتنا المؤثر الذي سبب ال (metastasis) ويعدلات نمو أضع من المستوى الطبيعي

❑ In medical usage, a **neoplasm = tumor**. → نفس المعنى

❑ **Oncology**: The study of tumors.

According to a tumor's clinical behavior, there are two main types of neoplasms:

ورم حميد

- **Benign neoplasm** = Limited new growth **without** local invasion or spread.

1. Innocent.

2. Remain localized.

3. Amenable to local surgical removal.

4. Patients generally survive.

تبقى في نفسه
للجان دون ما تنتشر

لا
للـ surrounding
tissue التي حولها

بنقدر نزيلها
بعمليات
الجراحية

- **Malignant neoplasm** = Invasive growth locally, which also spreads to distant sites.

- May be fatal.

تعايم الـ tissue
التي عليه

له يهكن ينتشر لافاكن بعيدة

❖ **Cancer**: Is a general term for all **malignant** growths.

❖ Components of neoplasms:

All tumors (benign or malignant) have 2 basic components:

- (1) **The parenchyma:** the transformed or **neoplastic** cells (from which the tumor derives its name).

له الخلايا التي صار فيها التغيرات وبالعادة ال tumor بوض استهامة

- (2) **The stroma:** supporting, host-derived, **non-neoplastic** (connective tissue, blood vessels, and inflammatory cells).

↓
الأشياء التي يحيط ب tumor وتدعمه عشان يص ال growth فيه أكثر

* أهمية ال Stroma

- Amount & type of stromal cells may contribute to the consistency and appearance of tumors.

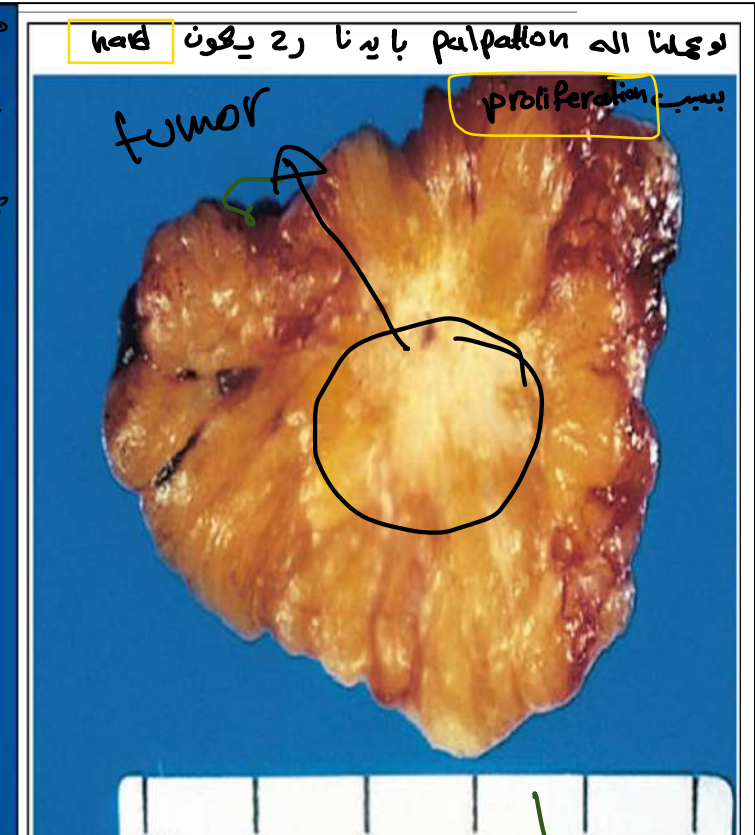
①
② Support the tumor for growth.

تحددوا طبيعة ال tumor هل هو cysti / soft / hard

- If there is stromal proliferation → hardness of the tumor → Scirrhus tumor → Desmoplasia.

كل ما كان في proliferation أكثر على ما كان hardness أكثر وينسب ال desmoplasia

- If there is lack of stromal cells, the tumor may be soft or cystic.

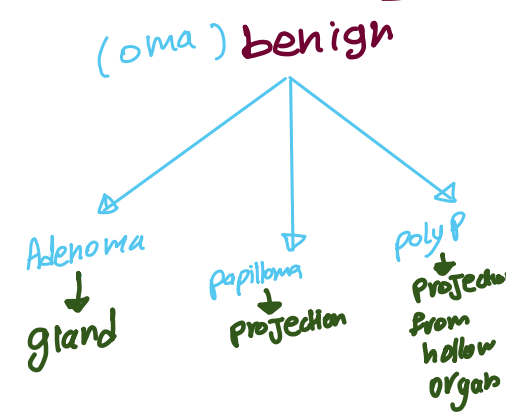
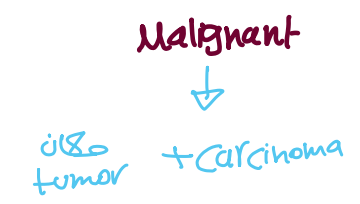


breast mass

(Eumor) ወይን ስም

Connective tissue

epithelial tissue



benign

Malignant

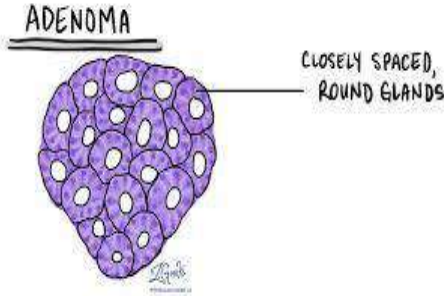


تسمية ال tumor ال Ep. cell

Tumors of Epithelial Cell Origin

❖ Benign Epithelial tumors:

تumor ينتهي ب (oma) يكون (benign) "تسمية عامة"



1. Adenoma:

benign tumor of ep. cell

gland tumor يكون

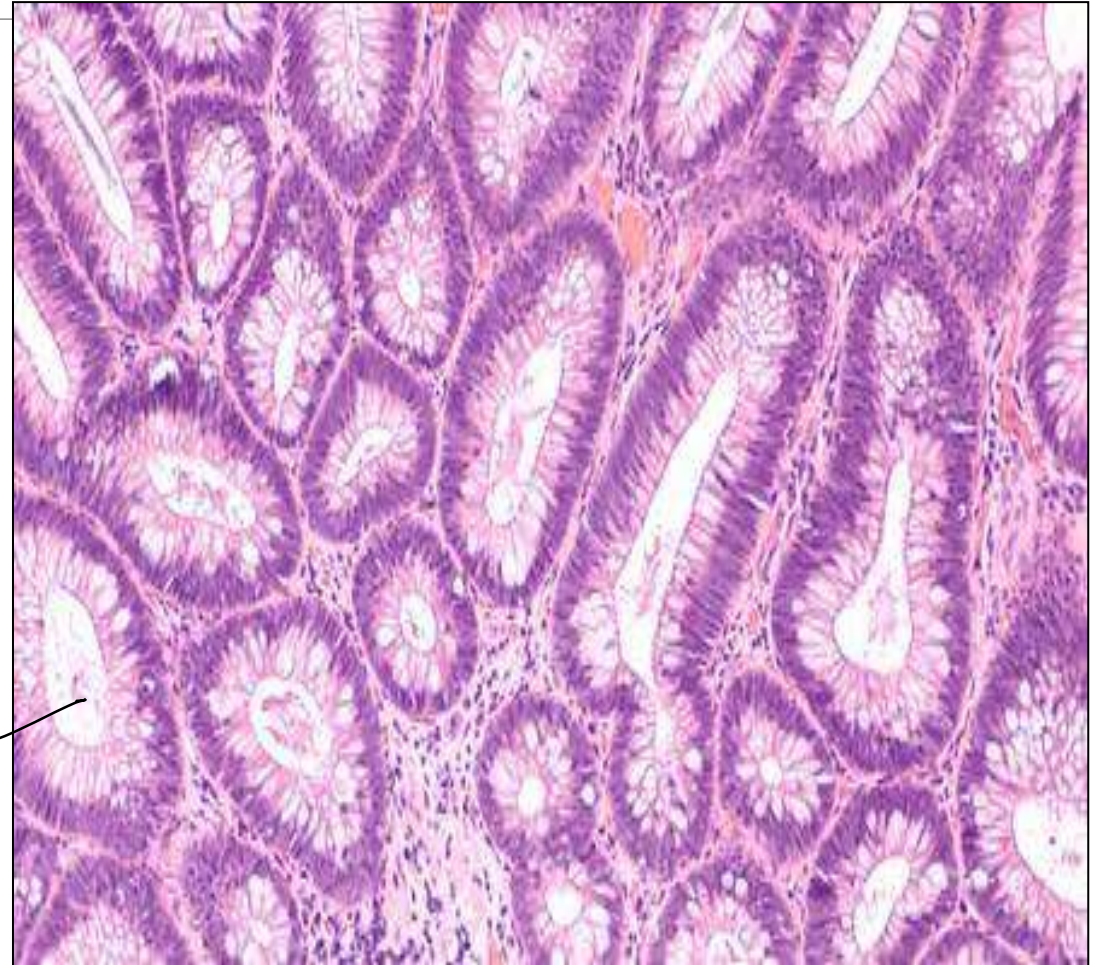
- Produces glandlike structures, or benign epithelial neoplasms that are derived from glands but lack a glandular growth pattern.

* اذا كان ال tumor ال شكل gland

* اذا ال cell ال tumor ال gland ال يكون كاتبة solid sheet

Cystadenoma: Hollow cystic masses that typically arise in the ovary.

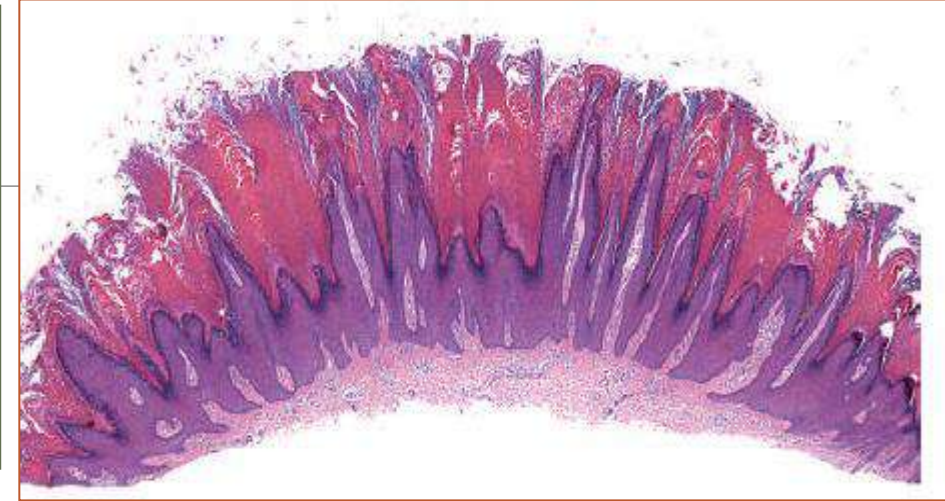
gland ← خلايا tumor ترتيب صوليت space



2. Papilloma:

Epithelial tumor forming **finger-like fronds/projections** from any epithelial surface, with a connective tissue center.

Squamous cell Papilloma

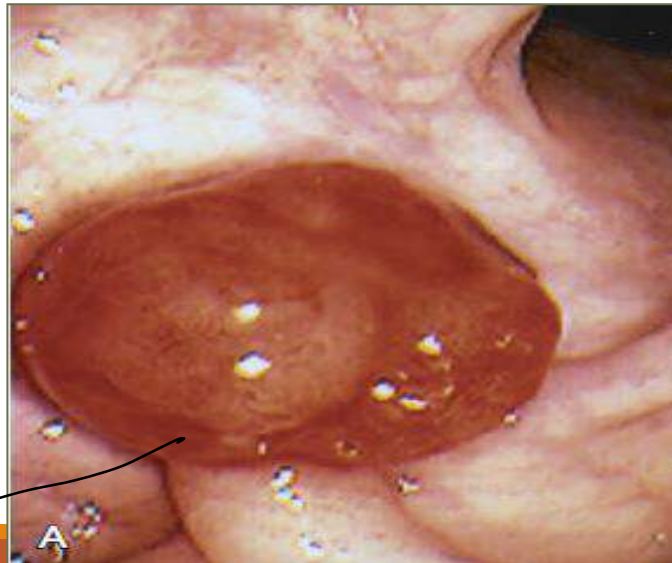


Handwritten notes: surface is hollow (مساحة) Mass (كتلة) Neo plastic (تكوين جديد) reaction (رد فعل) benign (غير سرطاني) cancer (سرطان)

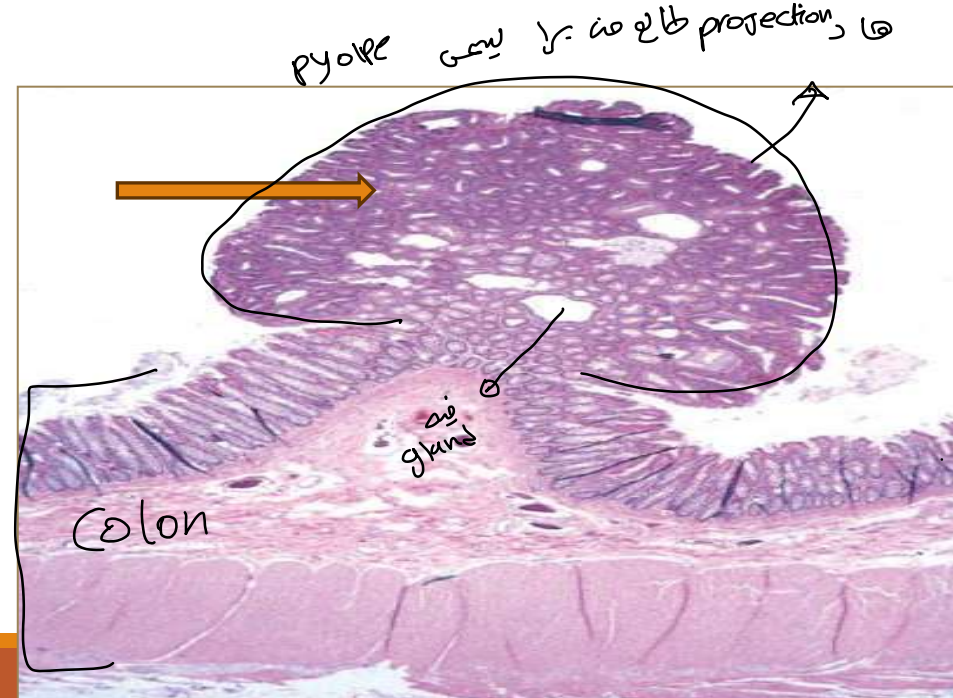
3. Polyp:

General term: !neoplastic/non-neoplastic! A mass projecting from the mucosal surface of a hollow organ.

in colon gland benign projection Colonic adenomatous polyp



Handwritten label: polyp



(Cancer tumor) + Carcinomas

(ep. cell) malignant tumor
↑

❖ Malignant epithelial tumors (Carcinomas):

1. Squamous cell carcinoma: from squamous cells or produce squamous cells e.g. skin, mouth, cervix...etc

2. Adenocarcinoma: from glandular origin or grow in glandular pattern, e.g. G.I.T., endometrium, breast, thyroid...etc

mesenchymal tissue

CT
↓ tumor ↓
benign
→ malignant

Tumors of Connective tissue cell origin

1. Benign: Named by **tissue of origin** with the attached suffix – **oma**

e.g. fibroma, lipoma, chondroma...etc **tissue + oma**

↓
fibrous tissue

↓
lipid

↓
cartilage

bone = osteoma

2. Malignant connective tissue tumors: SARCOMA: Prefix (**origin**) + suffix (**sarcoma**)

e.g. Osteosarcoma, liposarcoma, angiosarcoma, leiomyosarcoma, ... **tissue + sarcoma**

↓
bone

↓
lipid

smooth muscle

Fibrous tissue → fibrosarcoma

Cartilage → chondrosarcoma



○ ma = benign
↓
↓
↓ malignant

هائم جونا

Exceptions (these are malignant, but end with oma)

- Leukemia, Lymphoma
- Glioma → Neuron ^{malignant} tissue
- Melanoma → Melano cell
- Mesothelioma → Mesothelium cell
- Retinoblastoma → Retinia (eye)
- Seminoma... → testis

(type of cell) (tumors) مكون من أكثر من

Mixed Tumors:

3 germ cell layer → endoderm
ectoderm
mesoderm

1. Single germ cell tumors: Derived from **one** germ cell layer that differentiates into more than one cell type.
but different cell type

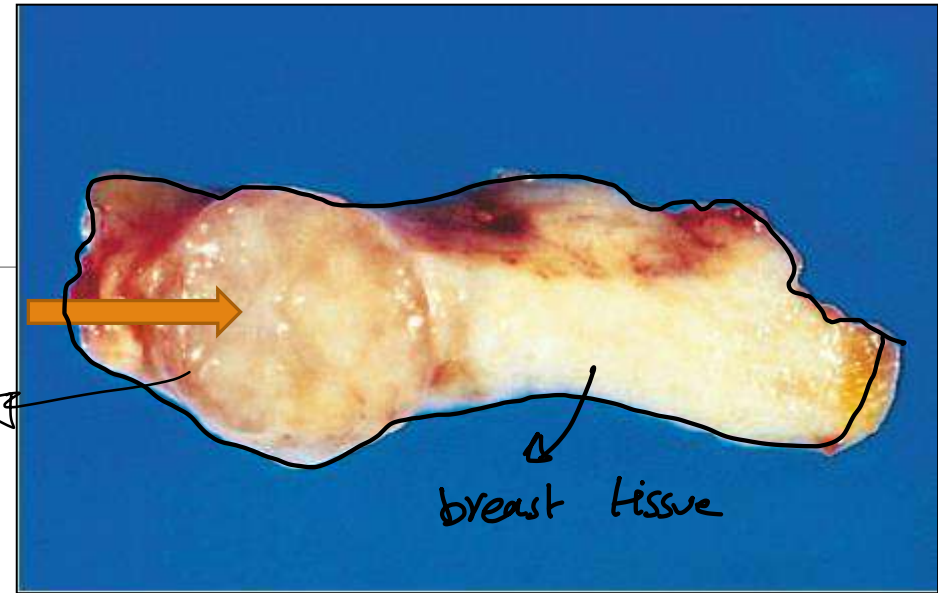
e.g., *Mixed tumor of the Salivary Gland (pleomorphic adenoma)

*Fibroadenoma of the breast.

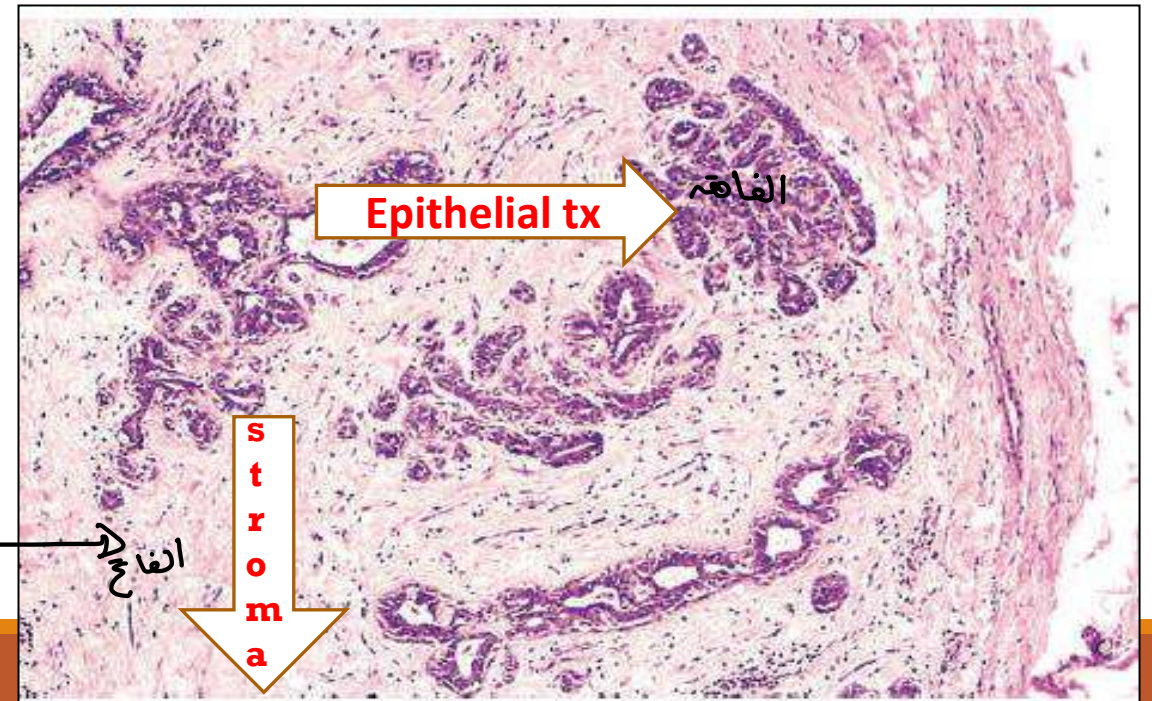


1. Fibroadenoma of breast

- Gross: Encapsulated small tumor is sharply demarcated from the breast tissue.



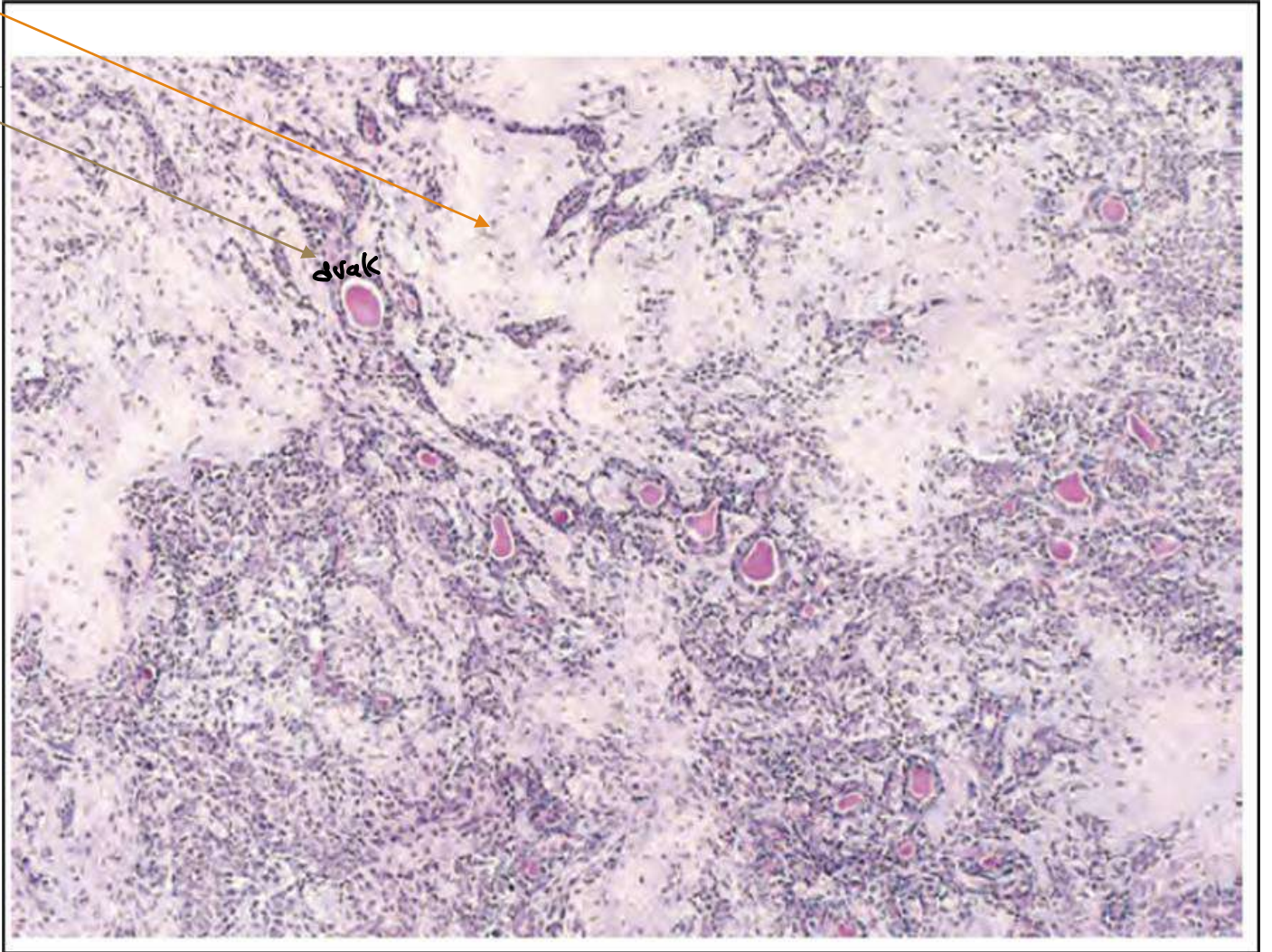
- The fibrous capsule (right) sharply delimits the tumor from the surrounding tissue



Mixture of CT. and epithelial tissue → from the same cell germ layer

2. Pleomorphic adenoma:

- Composed of epithelial cells and myxoid stroma resembling cartilage

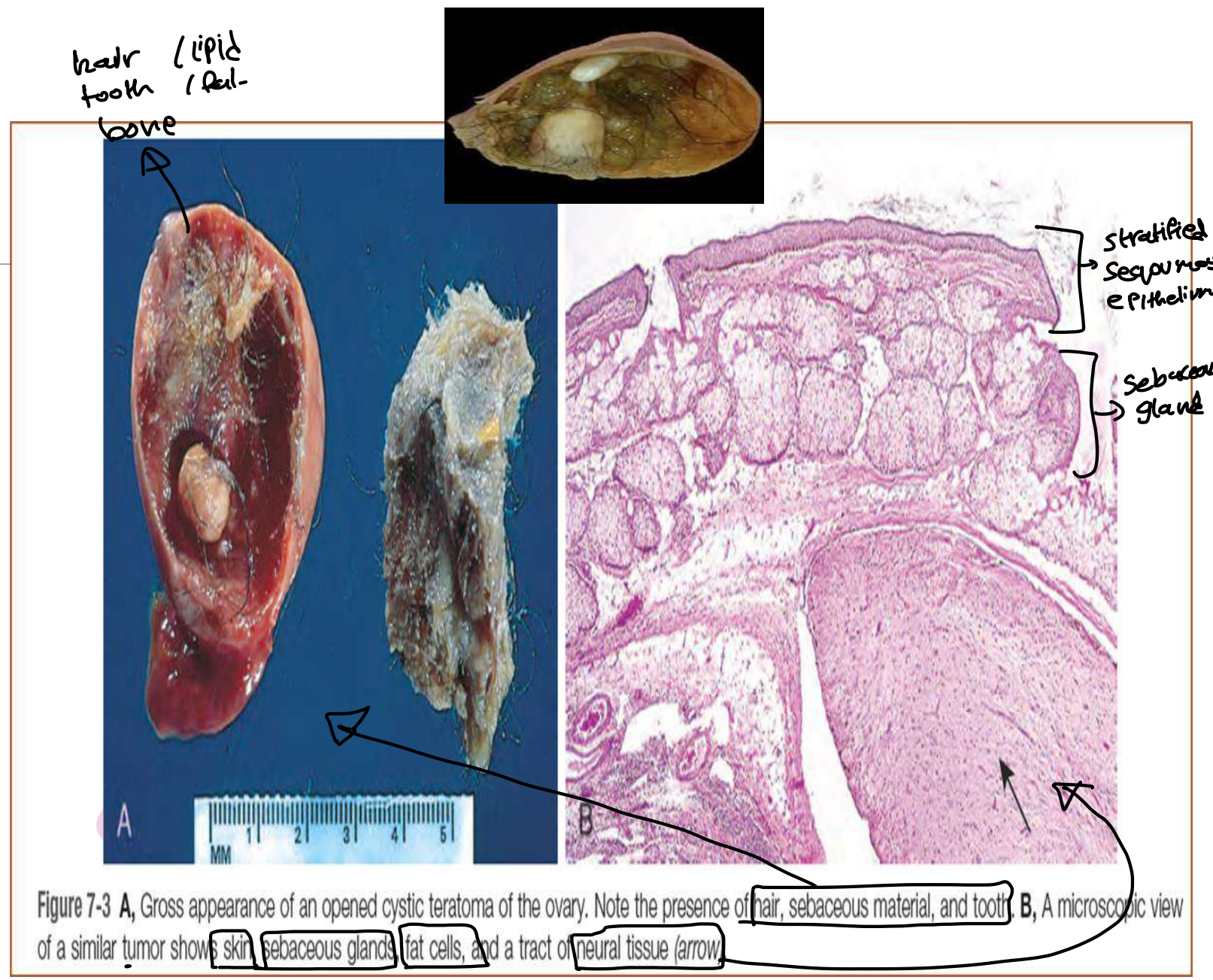


قوله تنوع في الالوان
 benign
 malignant

2. Teratomas:

- Composed of a variety of parenchymal cell types that are derived from **more than one germ cell layer** (ectoderm, endoderm & mesoderm)
- May contain skin, sebaceous & mucus glands, hair, cartilage, bone, teeth, respiratory epithelium, glial tissue...etc.
- May be benign or malignant
- Usual location is the **ovary** or **testis**

تنوع الالوان
 Female
 Male



(التسمية)

Tumors of primitive fetal origin:

له ال tumor حابكون نافع يعني جسد الجنين تا عته زي شكل ضرايا ال fetus

فetus زي

Blastoma: from **im**mature tissue.

-May arise in the kidney, liver, retina...etc.

- e.g. * Nephroblastoma ^{Kidney ←} (البركان الي طالع فيه) + Blastoma
- * Retinoblastoma _{retina ←}
- * Hepatoblastoma _{liver ←}

-They are **malignant & occur in infants** & children.

له يمكن يولد الطفل منهم

Some 'tumors' are NOT true neoplasms

صوه خلفي لكن حتى neoplasm عادة يندعي ب (oma)
↓
Normal يعني

□ **Hamartoma**: Tumor-like developmental malformation in which there is an abnormal mixing of normal components of the organ, either in the form of a change in quantity or arrangement of tissue elements. Lung → pulmonary hamartoma

له بتكون حكون من مكونات ال (Lung) لكن الترتيب و الترتيب يكون خلط
وبكون حتى مع

□ **Choristoma**:

- Congenital anomaly where different types of tissue grow ectopic to the region. e.g. - Meckle's Diverticulum in the small intestine containing gastric tissue.

pancreatic tissue → in Small intestine
له يعني tissue يكون مع لكن مكانه الفلأ

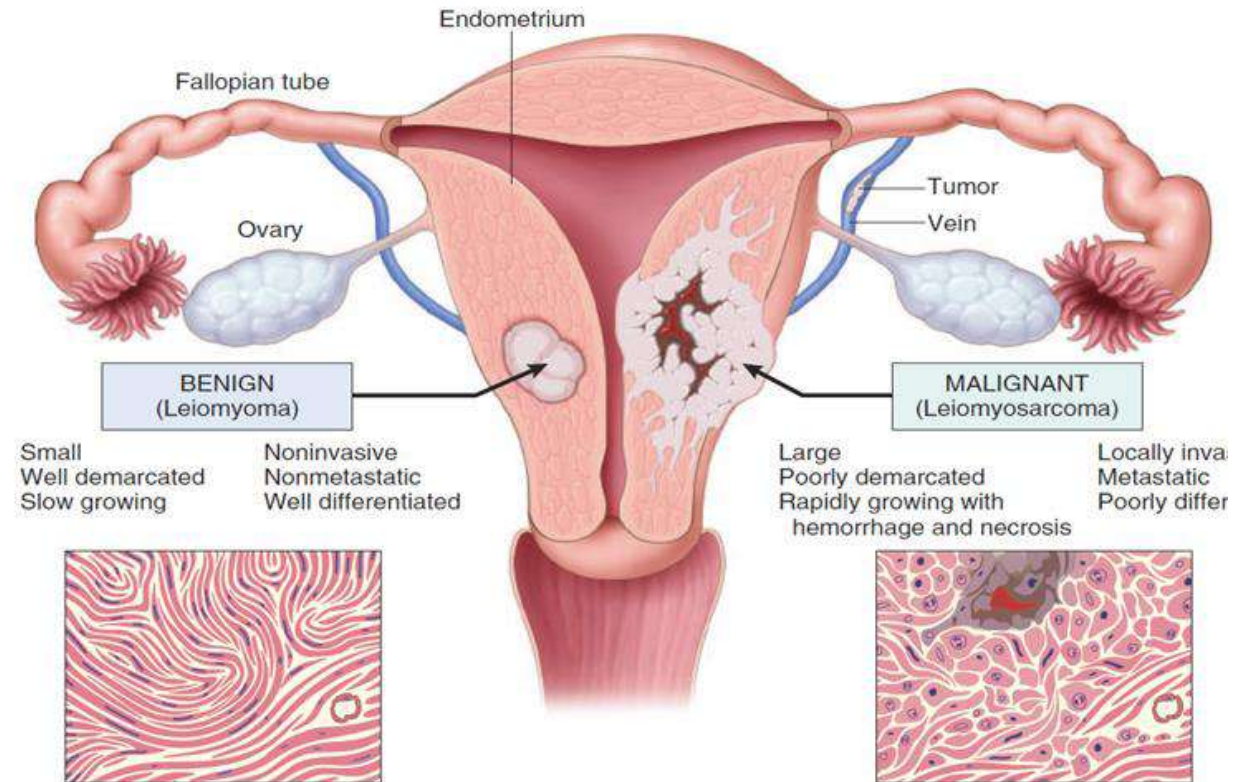
↓
tissue
في مكانه الفلأ

Characteristics of benign and malignant neoplasms

تفریق کے لیے مختلف واحد سے کیے ہیں benign اور malignant

Tumors can be distinguished on the basis of:

- Differentiation & anaplasia
- Rate of growth
- Presence of capsule
- Local invasion
- Distant metastasis



1- Differentiation:

قد يشي الخلايا تاعون (Lunar) تشبه ضايا ال origin للموجودة فيه من ناحية شكلا ووظيفة

- This indicates the **degree of resemblance** of the tumor cell to its parenchymal cell of origin, both functionally & morphologically.

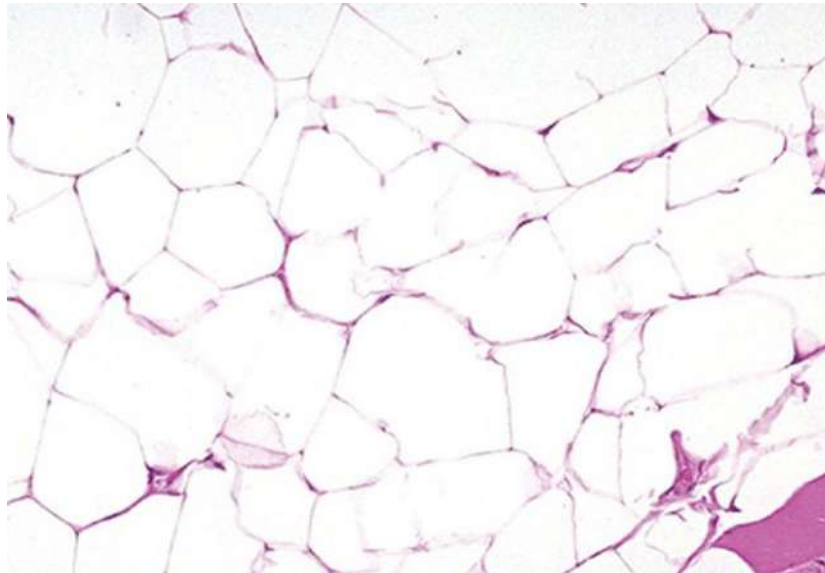
- **Benign** tumors are composed of **well-differentiated** cells that closely resemble their normal original tissue.

له بصور ال origin

- While **malignant** neoplasms exhibit a **wide range** of parenchymal cell differentiation (**well-moderately-poorly differentiated**).

Example:

- Cells of a **lipoma** may look exactly like normal fat cells. *well differentiated*



↑
ضد ال tumor لما تفقد ال differentiation (حزب نكب صفات صبيحة dysplasia) ← موانع لا benign / malignant



When a tumor cell loses differentiation, it gradually gains features of **DYSPLASIA**

■ **Dysplasia** is a disorderly proliferation of cells with a loss of architectural orientation

■ **It may precede malignancy.** مجانة dysplasia يسبقه malignant

ANAPLASIA= Severe Dysplasia: Total loss of differentiation

□ Cytological Features of Dysplasia

- **Increased Nuclear Size, ↑ N/C (nuclear to cytoplasmic) Ratio**
- **Pleomorphism** : Variation In Nuclear & Cell Size & Shape
- Loss Of Differentiating Features
- **Hyperchromasia**: Increased Nuclear DNA Content. → very dark
- **Nucleoli: Prominent**, May Be **Multiple**
- **Mitotic Figures: Increased** → proliferation
- **Abnormal Mitoses**: May Be Present
- **Loss Of Polarity**: Failure Of Orientation And Polar Arrangement Of An Epithelial Surface

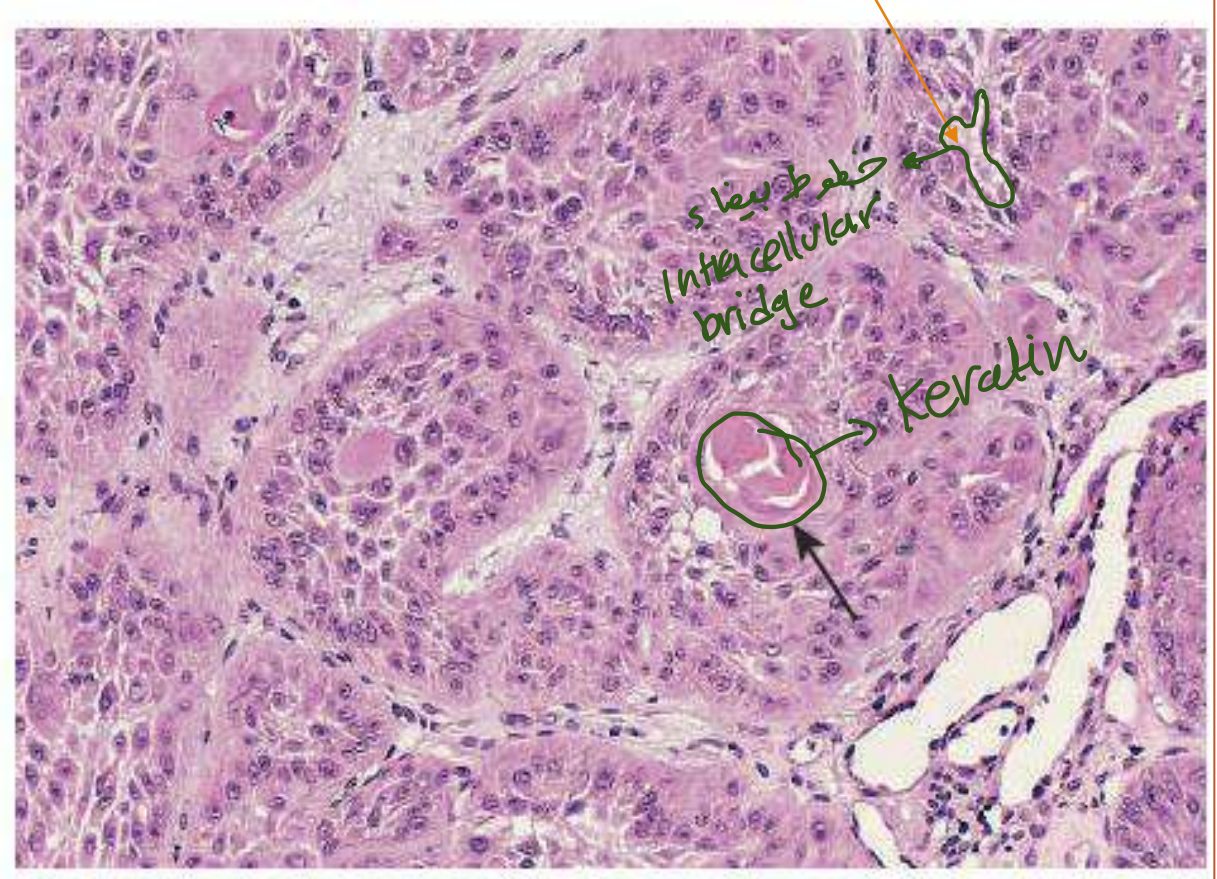
قدرة تمايزها squamous

- ① keratin
- ② In cellular bridge

ما يقدر أجزءها الصورة

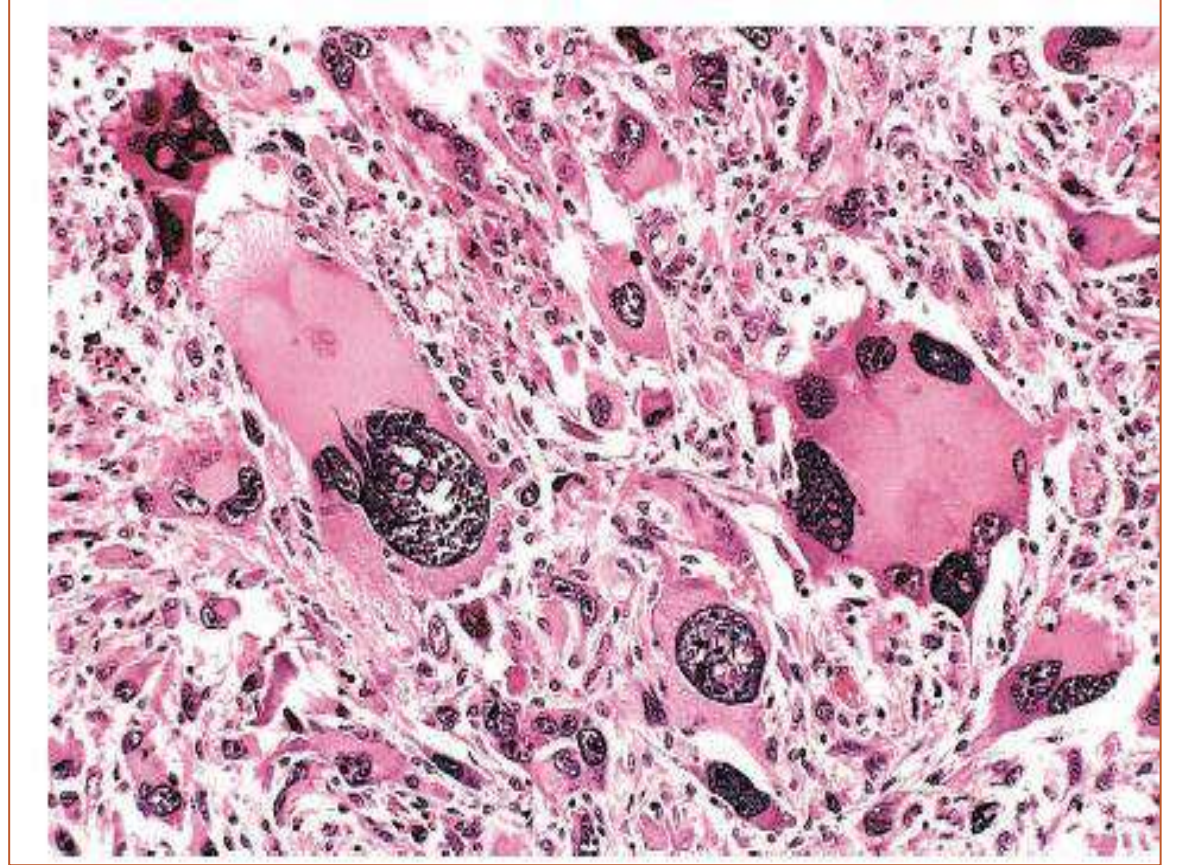
Well-differentiated squamous cell carcinoma of the skin. The tumor cells are **similar to normal** squamous epithelial cells, with **intercellular bridges** and nests of **keratin** (arrow)

Carcinoma



قدرة افرق بين tissue of origin

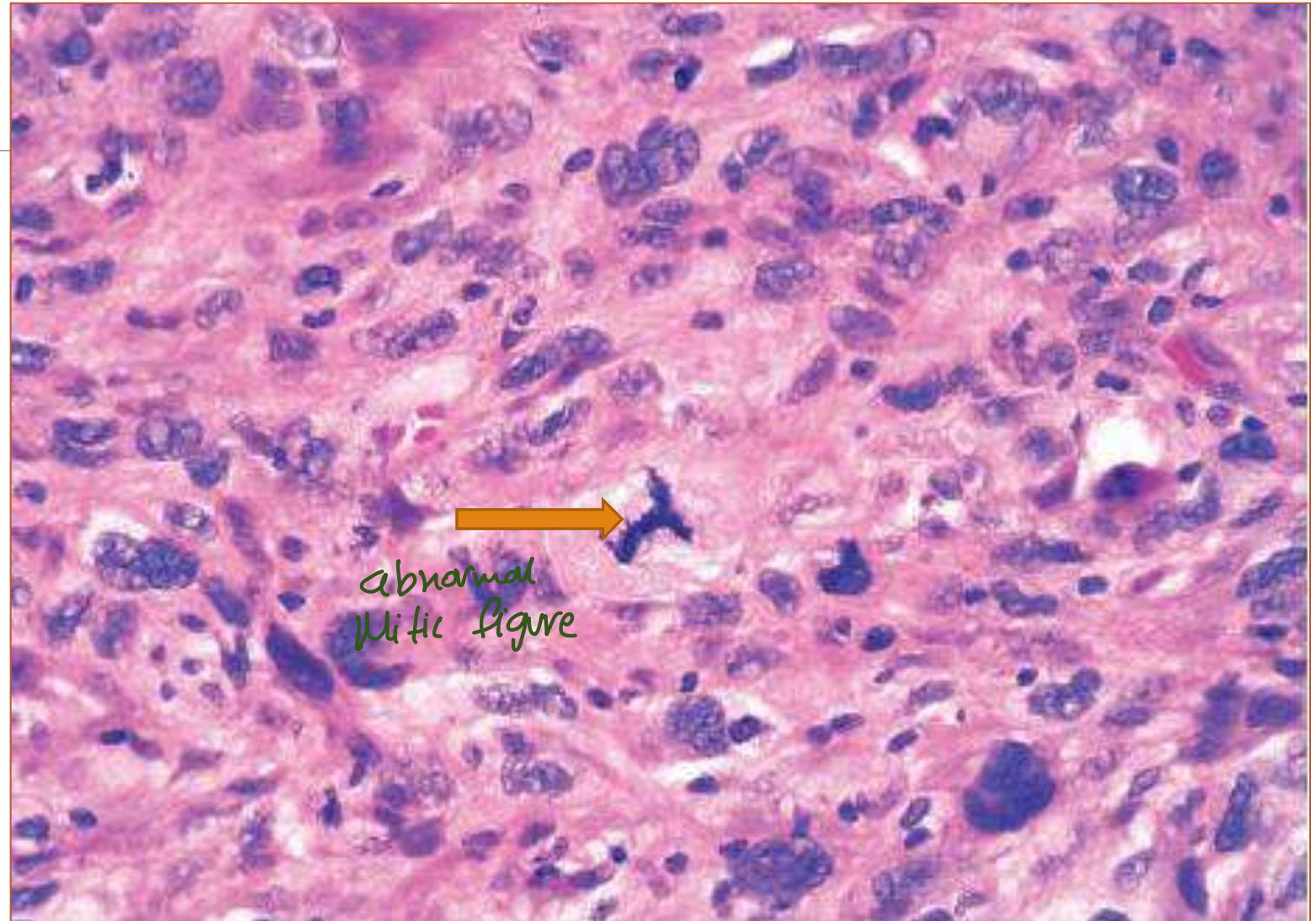
Poorly differentiated: **Pleomorphic malignant** tumor with marked variation in cell and nuclear sizes, the hyperchromatic nuclei, and the presence of tumor giant cells



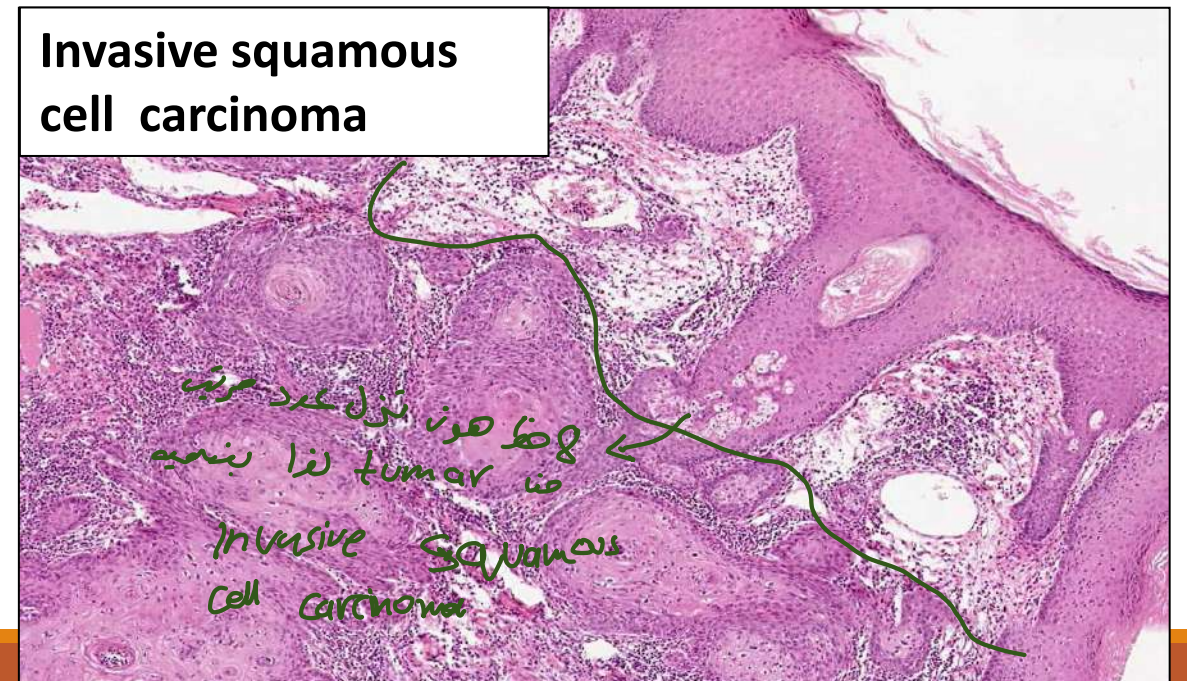
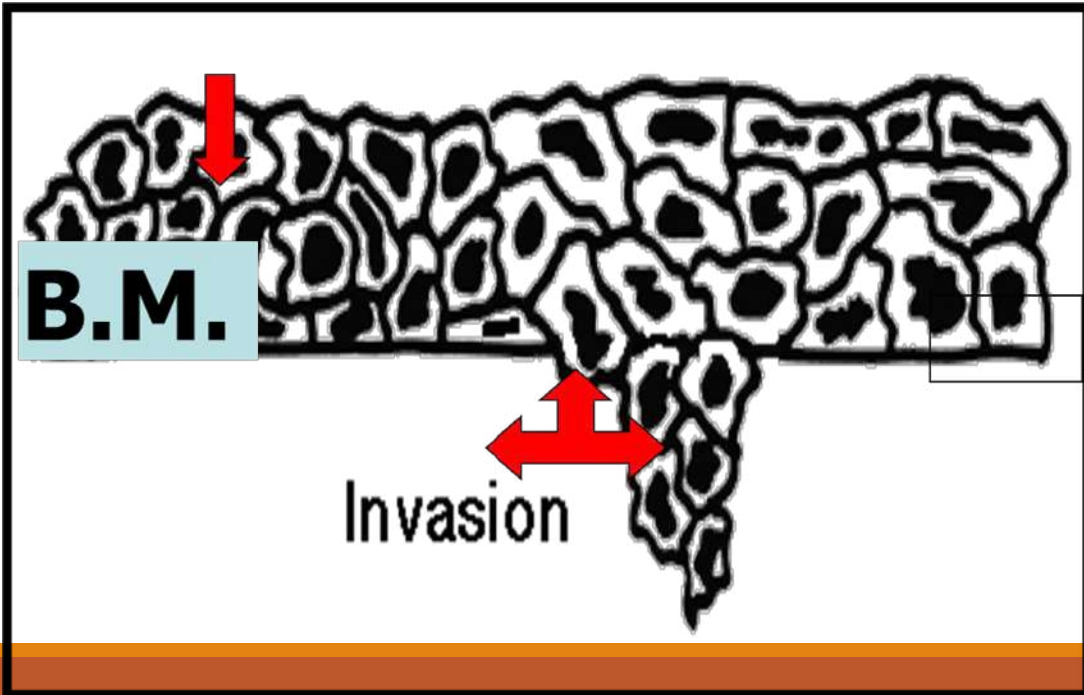
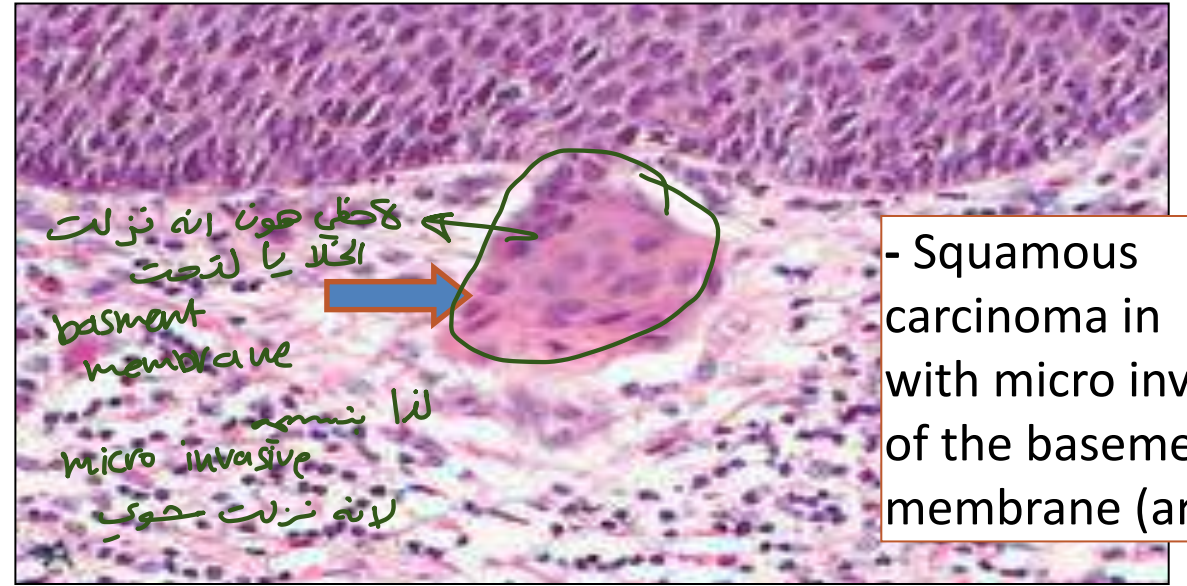
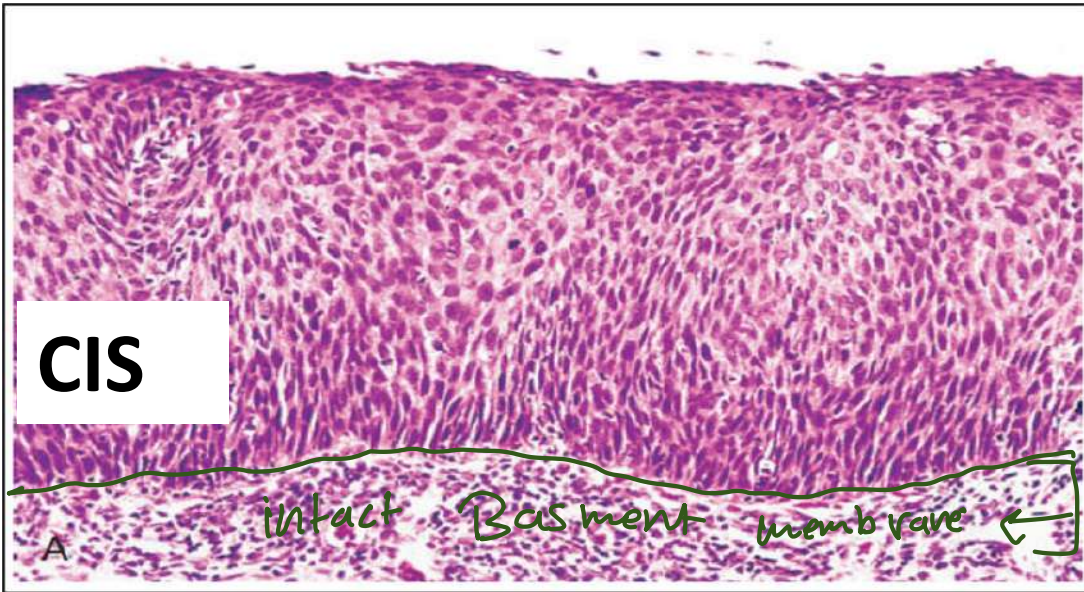
Squamous / cell / gland

↓ differentiation

- **Anaplastic** tumor cells show cellular and nuclear variation in size and shape.
- The arrow points to an **abnormal tripolar mitotic figure**



abnormal
Mitotic figure



2- Rate of growth

- Usually **slow in benign** and **rapid in malignant** tumors.
- Rate of growth usually correlates with level of differentiation.
- **Exceptions:**
 - Hormonal influences: e.g. Leiomyoma of uterus in pregnancy (grows very fast) *benign*
 - Some malignant tumors may outgrow their blood supply --> C. ischemic necrosis, so grow slowly

3- Local invasion & Encapsulation

- **Benign tumors:** frequently have a fibrous capsule or are well-demarcated and do not have the capacity to invade the normal tissue. *تھون سے گانہ واپس capsule کا بچا تھ tissue*
- Remain localized to their sites.
- **Malignant tumors:** lack well-defined capsules and progressively invade and destroy surrounding tissue.

Invasiveness is the second feature that most reliably distinguishes cancers from benign tumors after metastases. *تھی ای فیچر*

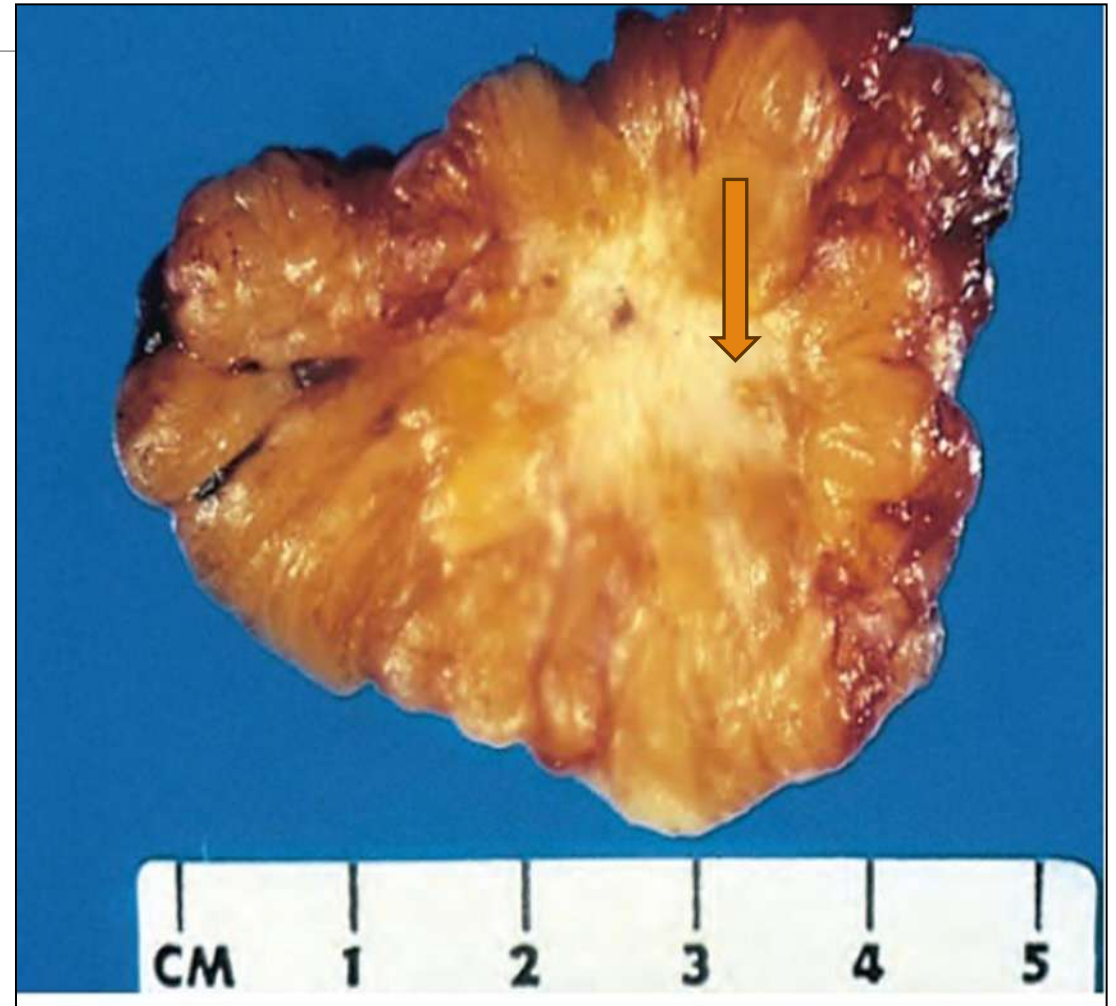
میں مہینہ و benign malignant

Liomyomata: uterus showing multiple shiny, white, well-demarcated but unencapsulated leiomyomas in the wall.



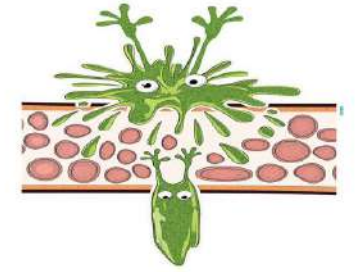
Invasive ductal carcinoma of breast

This tumor is non-encapsulated, infiltrating the surrounding breast substance & is stony-hard on palpation.



4- Metastasis:

أهم حالة في أورام Malignant



انتشار الورم لمكان بعيد

- Spread of malignant tumors to distant sites that are physically discontinuous with the primary tumor and unequivocally marks a tumor as malignant.
- Proportionate to the size and differentiation of the primary tumor
- **Most important factor in the diagnosis of malignancy**
- All tumors can potentially metastasize except **BASAL CELL CARCINOMA** & **most 1ry brain tumors (glioma)**

(A) Skin
 (B) Malignant tumor
 ↗ لا يسال metastasizes

Routes of metastases:

طرق انتشار الورم

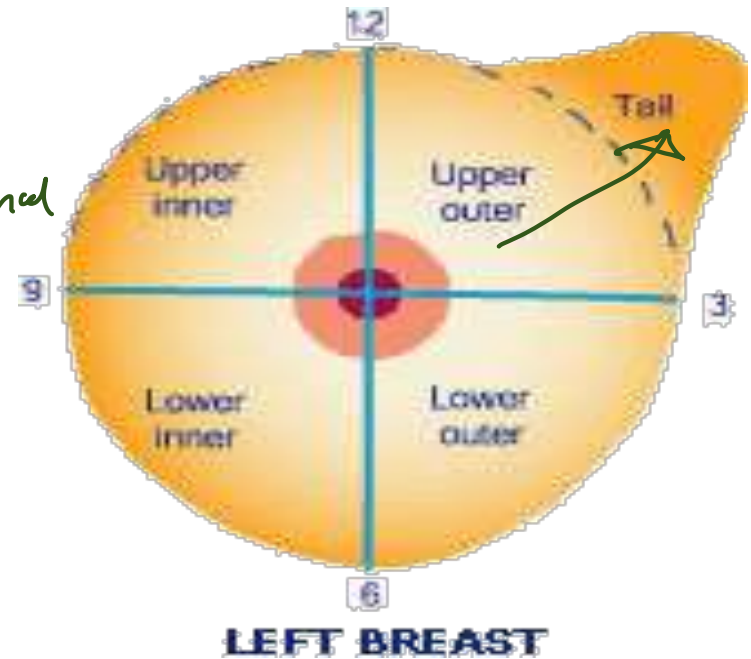
1- Lymphatic Spread:

- All cancers, but more **typical of Carcinoma.**
- Spread follows the anatomical route of drainage e.g.
 - Breast cancer in upper outer quadrant → axillary L.N.

ينتقلون خلال
lymphatic canal

→ axillary L.N.

له ينتشروا للأقرب



IMPORTANT IN SURGICAL RESECTION:

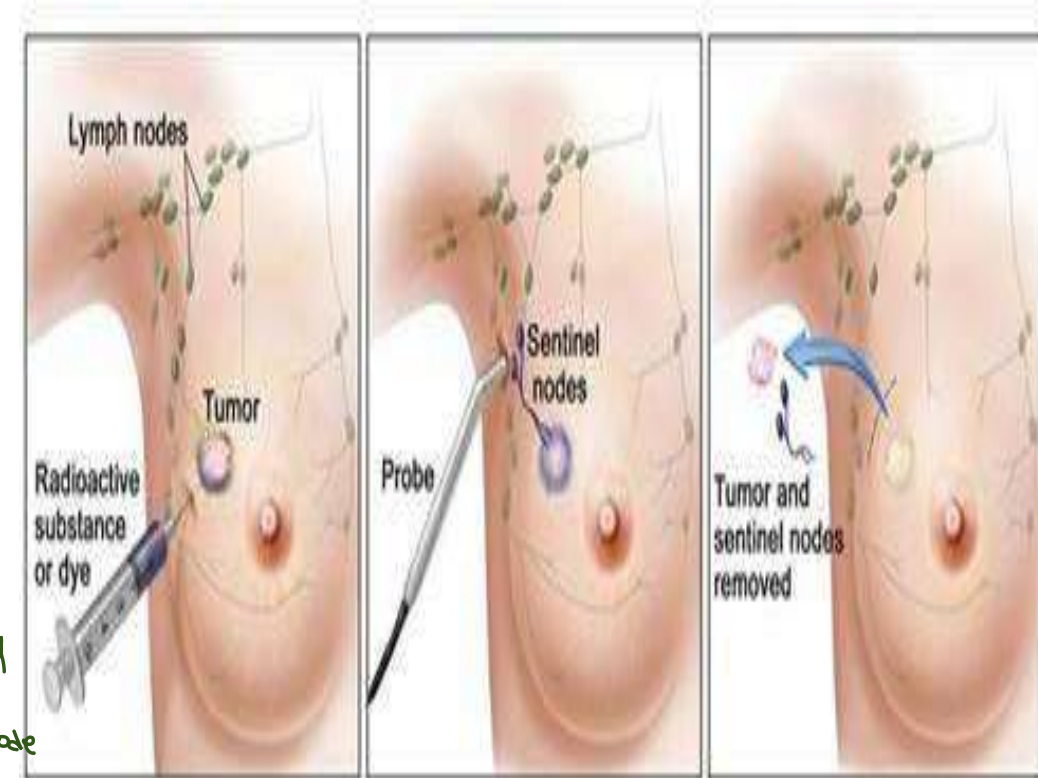
أول lymph node بو كهلها lymph فاعنه منطقة tumor

■ Sentinel Lymph Node:

- The **first** regional lymph node that receives lymph flow from a primary tumor (outlined with a blue dye).
- Biopsy from sentinel lymph node allows determination of the extent of spread of the tumor.
- Not all enlarged L.N.s indicate Mets

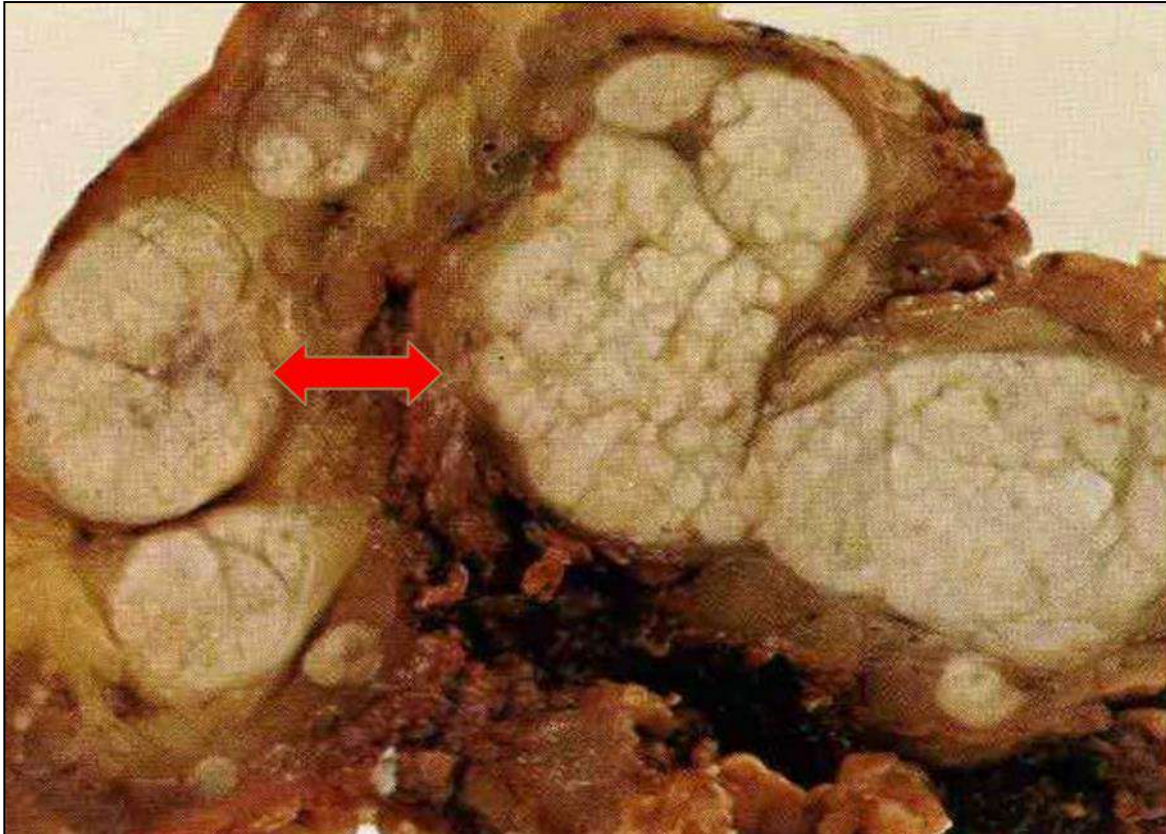
e.g. Reactive hyperplasia

الدكتور بجيب صبغة دبحقت مكان (tumor) او lymph node طوتت بالصبغة هي اول lymph node به ال tumor بوخو هاي (lymph node) وبتاكد اذا فيها tumor
 ① اذا فيها tumor يعني ما صار انتشار لا tumor فارح يتيلو lymph node
 ② اذا فيها tumor يعني صار انتشار لا tumor



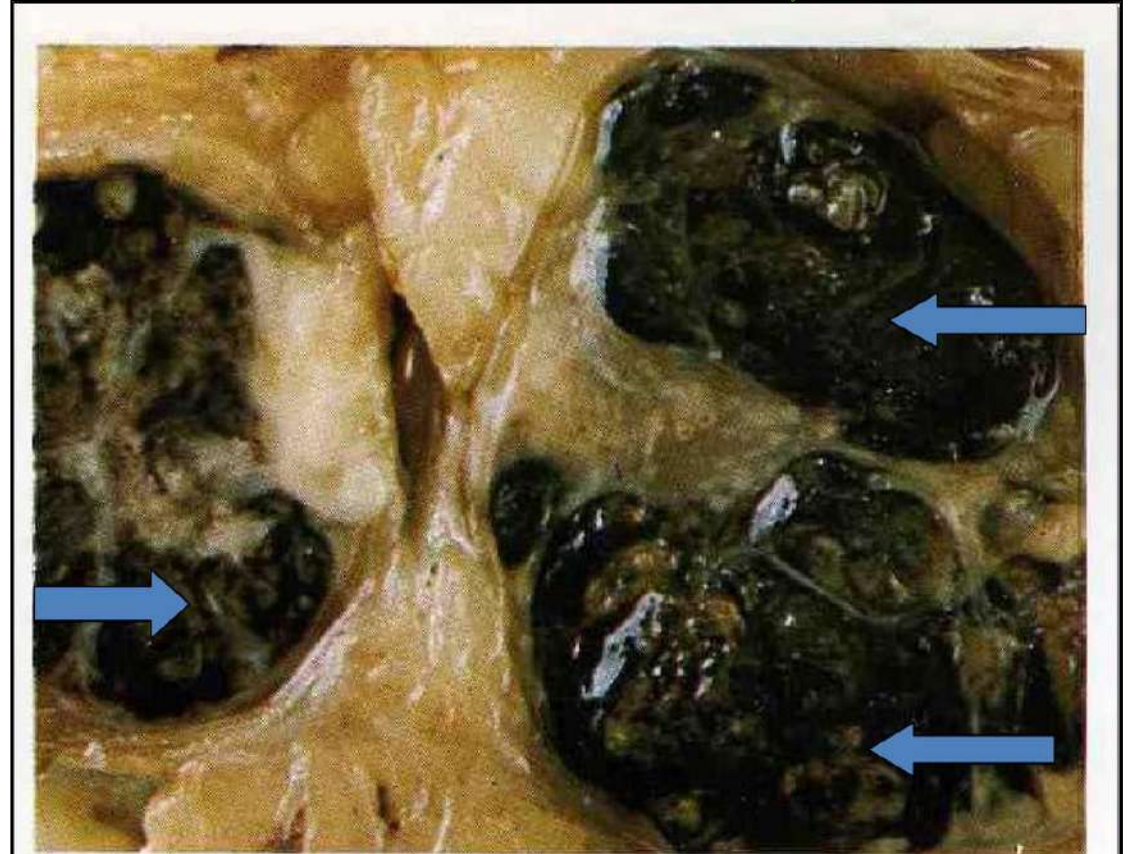
لا mesentric node اذا او tumor غالباً 2 يكون بالاعلى المقرب هو Colon

Secondary carcinoma: mesenteric lymph nodes with white deposits of secondary carcinoma from a primary rectal adenocarcinoma.



Secondary melanoma: lymph nodes are enlarged & largely replaced by melanin-laden secondary deposits of malignant melanoma.

عند الحرف tumor في Melano واصل
Zytes
black pigmentation نرى نودات lymph node Metastatic



انتقال التورم عن طريق الدم

2- Hematogenous spread:

■ Favored by **Sarcoma** but used by carcinoma.

- **Veins**, with thinner walls, are more readily penetrated than arteries.

- The tumor cells follow the venous flow draining the site of the tumor.

لا تفضل الدم يروح لهي ال Organ

❖ The **liver, lungs, and bones** are the commonest three sites involved in

hematogenous metastatic secondaries.

اذا كان multiple mass بنفي ال Organ يكون

metastatic cancer not primary



Liver, studded with multiple whitish metastatic cancer secondaries.

Peritoneal seeding by malignant cells of colonic adenocarcinoma

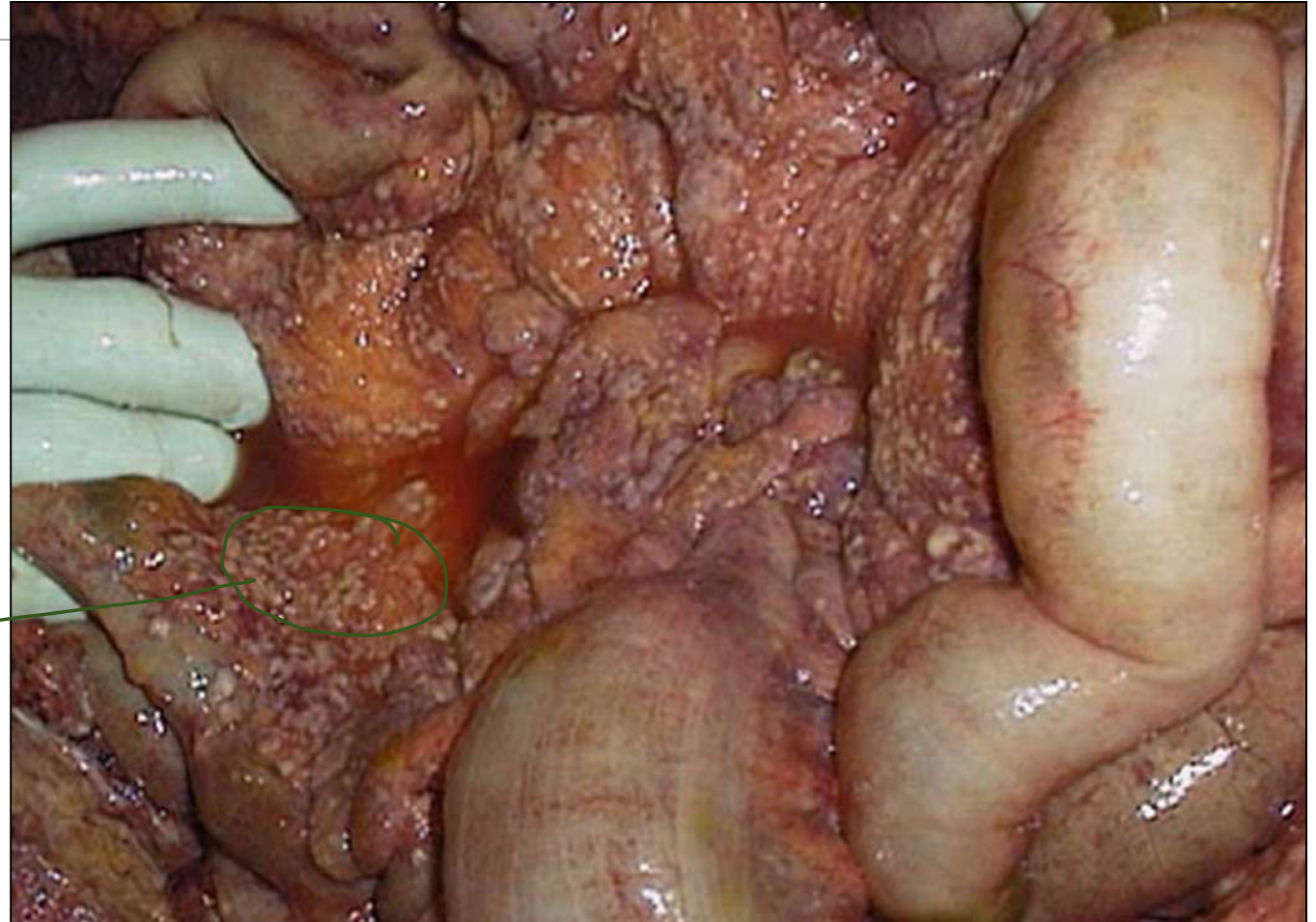
3- Transcoelomic spread:

- Within a natural body cavity like peritoneal or pleural cavity, e.g.:

- CA of the ovary tends to spread widely through the peritoneal surface
- CA of the upper lobe of lung to the lower lobe through the pleural surface
- CNS tumors may penetrate the cerebral ventricles & be carried by the CSF to be reimplanted on the meningeal surfaces, either in the brain or the spinal cord.

حقل التفریف
مكروب

white
lesion





وبس والله
دعواتكم