



# NEOPLASIA



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# Nomenclature

ورم أو كتلة

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

What are **TRANSFORMED** cells?

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

u x 2

1. Uncontrolled growth

دون استجابة لأي مشغول في جسم

2. Uselessness

ما في منه فائدة هاللعق

3. Persistence

مستمر

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

Same concept .

❑ In medical usage, a **neoplasm = tumor**.

العلم الذي يدرس الأورام

❑ **Oncology**: The study of tumors.

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

الورم الحميد

- **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.

ما يتهاجم خلايا المحيطة فيها .

الورم الخبيث

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

يهاجم خلايا مجاورة ويمكن يكون قاتل

- May be fatal.

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

## ❖ Components of neoplasms:

Parenchymal (neoplastic)

Stroma (non-neoplastic)

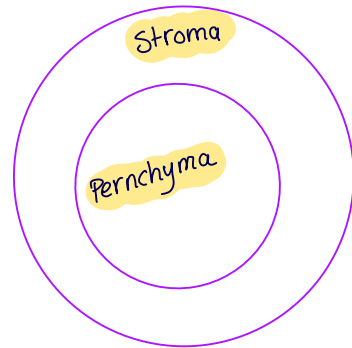
All tumors (benign or malignant) have 2 basic components:

عادةً الورم يوضع اسمه منها .

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

الأنسجة المحيطة بالورم ويتبعه بالفو

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



جای علی شکل (کیس / cyst)

لوعملانه (Palpation) بكون Hard  
لأنه عندي (Proliferation) لانفذا لحيطة  
شکل کبير (Desmoplasia)

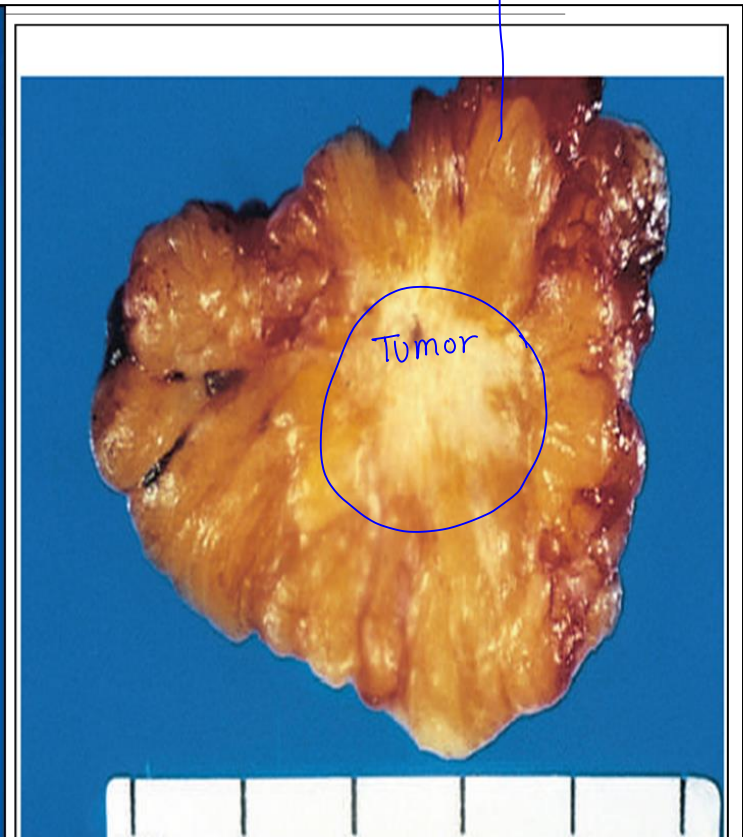
أهمية Stroma

كيف شكل الورم وتكوينه

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

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

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



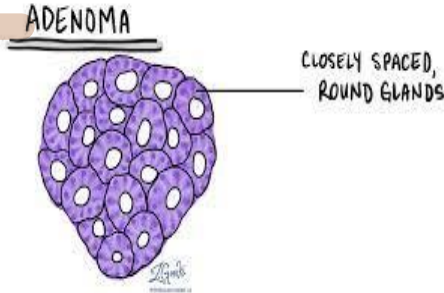
\* لقاعدة العامة أي ورم ينتهي بـ ( oma ) / هو ورم حميد .

# Tumors of Epithelial Cell Origin

برايه تكون adeno

تلق ما شفتنا Tumor مكون من gland  
لتصيف هو الليخ فواع (سره gland)

## ❖ Benign Epithelial tumors:



كيسب لاله .

gland like

حميد

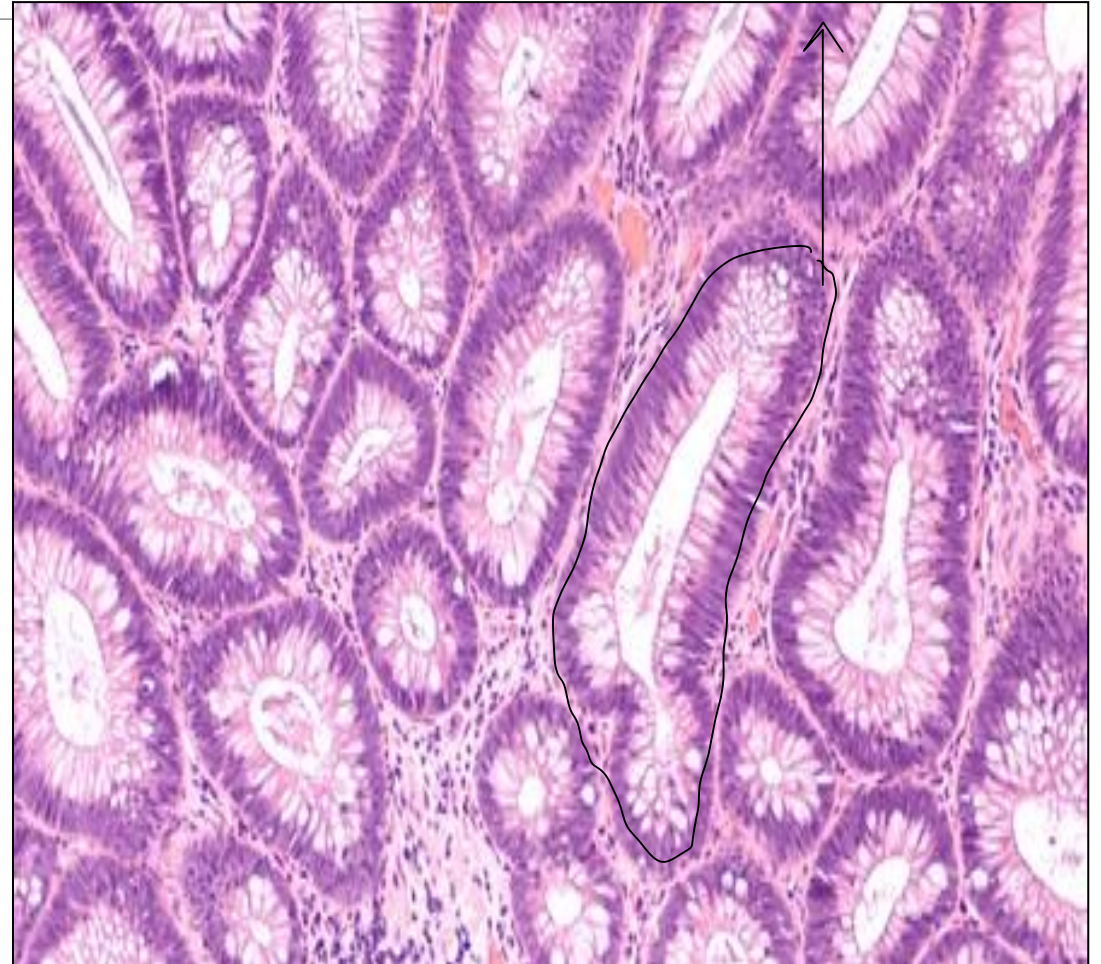
## 1. Adenoma:

arrangement of the tumor cell around space.

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

\* اصيأنا تكون solid لكن سببهم (adenoma) لانهم طالعين  
من gland / (arreganated from gland)

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

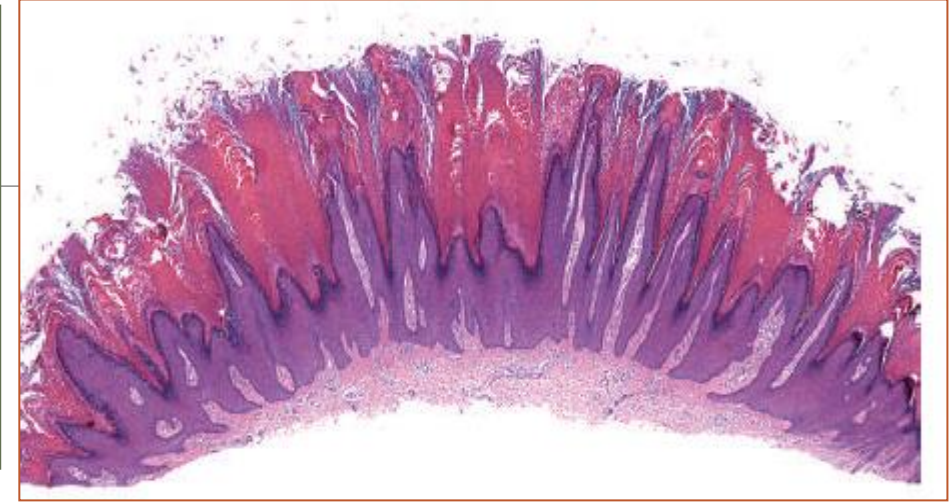
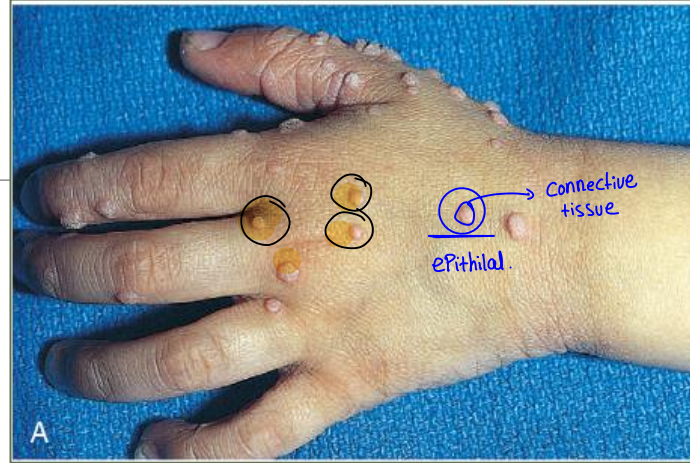




## 2. Papilloma:

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

## Squamous cell Papilloma

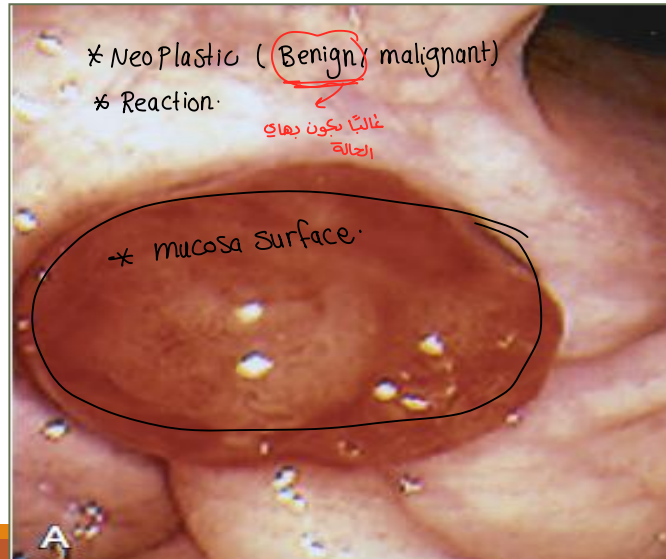


## 3. Polyp:

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

أي كتلة يتطلع من سطح لأي مكان مجوف في الجسم  
بنسبته Polyp

## Colonic adenomatous polyp



ماذا يوجد قبلا حسب العنق الذي اصابت به / لو كان منبثق

## ❖ Malignant epithelial tumors (Carcinomas):

Squamos / adeno

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

2. Adenocarcinoma: from <sup>gland</sup> glandular <sup>malignant</sup> origin or grow in glandular pattern, e.g. G.I.T., endometrium, breast, thyroid...etc



# Tumors of **Connective tissue cell origin**

/ mesenchymal tissue

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

e.g. **fibroma**, **lipoma**, **chondroma**...etc

Fibrous tissue

lipid

Cartilage

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

ماي إنتهاية التعريف .

e.g. **Osteosarcoma**, **liposarcoma**, **angiosarcoma**, **leiomyosarcoma**, ...

Bone

Smooth muscle

مهم جدًا  
على إركيدجاي بالامتحان



## Exceptions (these are malignant, but end with oma)

- Leukemia, Lymphoma
- Glioma (of Neural tissue)
- Melanoma (of melanocyte)
- Mesothelioma (of Mesothelial cell)
- Retinoblastoma (of Retina)
- Seminoma... (of testis)

# Mixed Tumors:

لكن بالاساس طالعين  
من one type

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

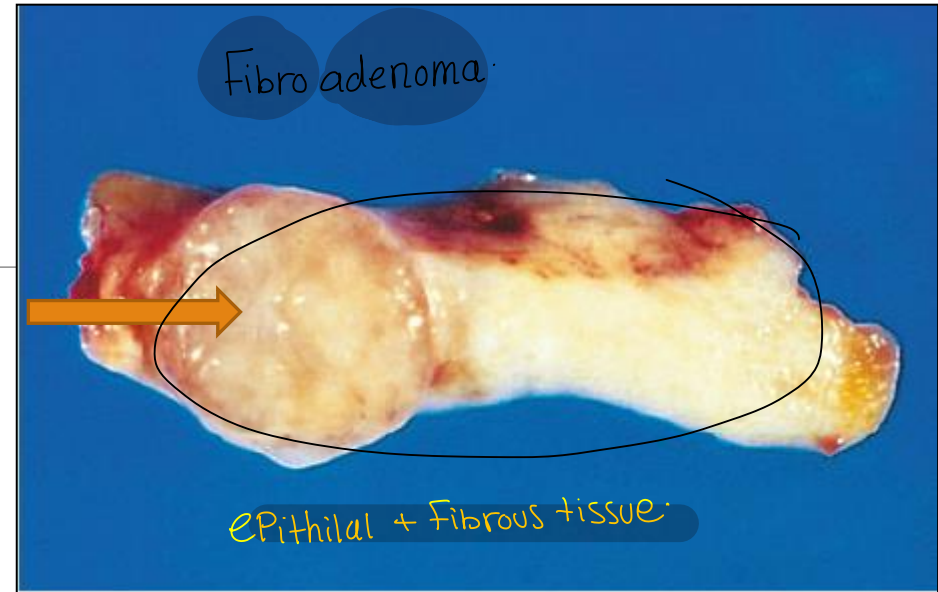
e.g., \*Mixed tumor of the Salivary Gland (pleomorphic adenoma)

\*Fibroadenoma of the breast.

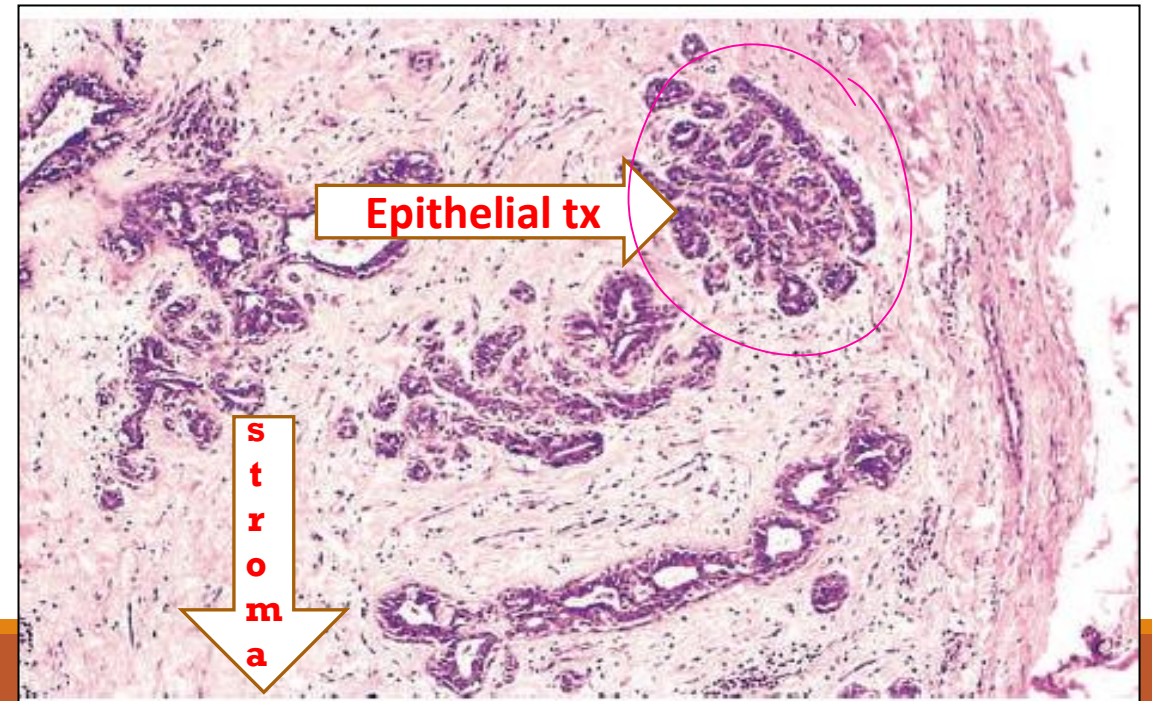
# 1. Fibroadenoma of breast

Benign. In Breast

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



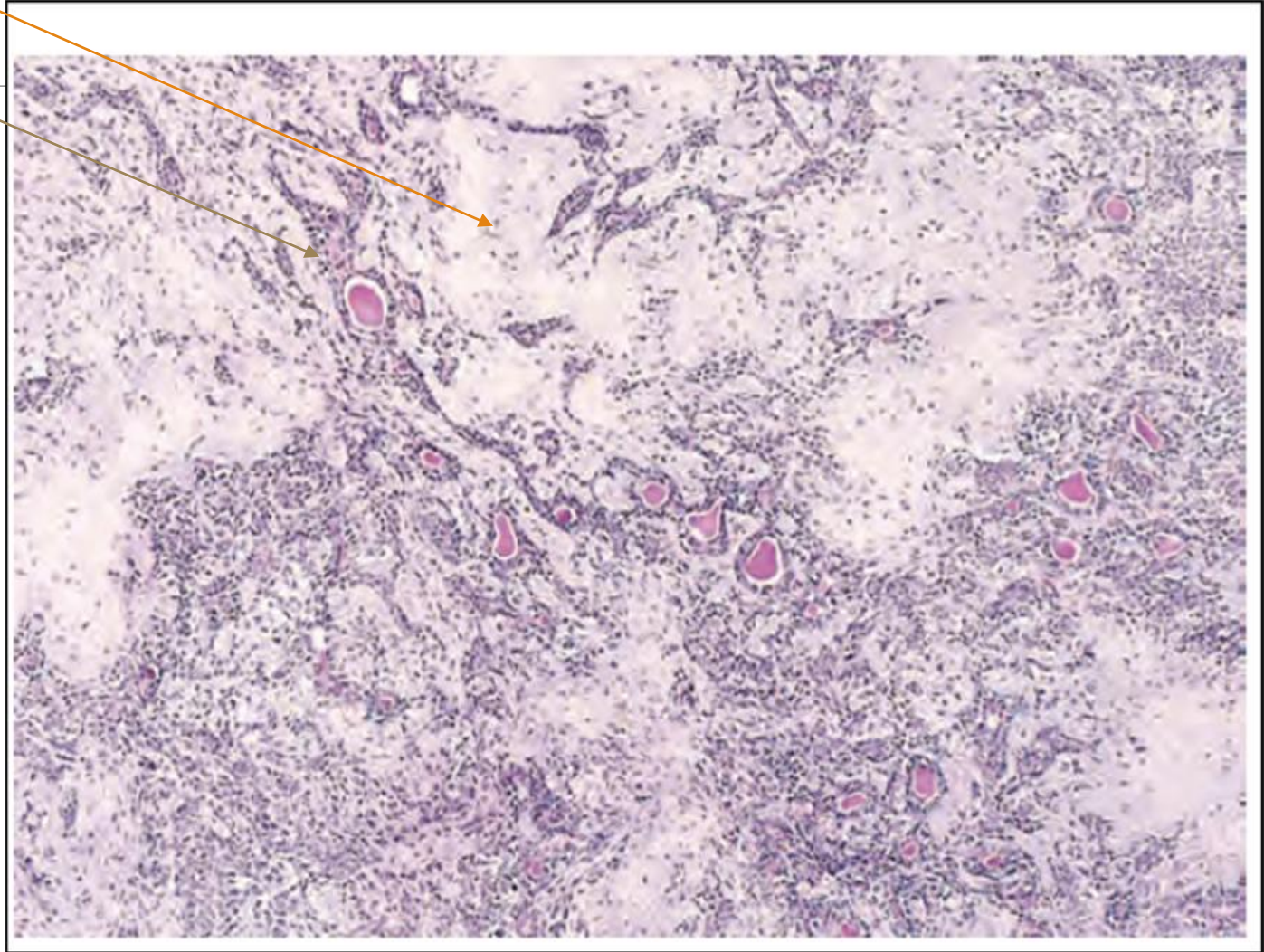
- The fibrous capsule (right) sharply delimits the tumor from the surrounding tissue



## 2. Pleomorphic adenoma:

→ In Salivary gland (epithelial cell + <sup>Cartilage</sup> connective tissue) <sup>كلام من نفس Layer</sup>  
→ (myxoid stroma)

- Composed of epithelial cells and myxoid stroma resembling cartilage



ممکن تګون ځېورت  
او لک

## 2. Teratomas

(In Female ovary, male Testes)

- 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



→ mixture of tissue  
Testes or ovary

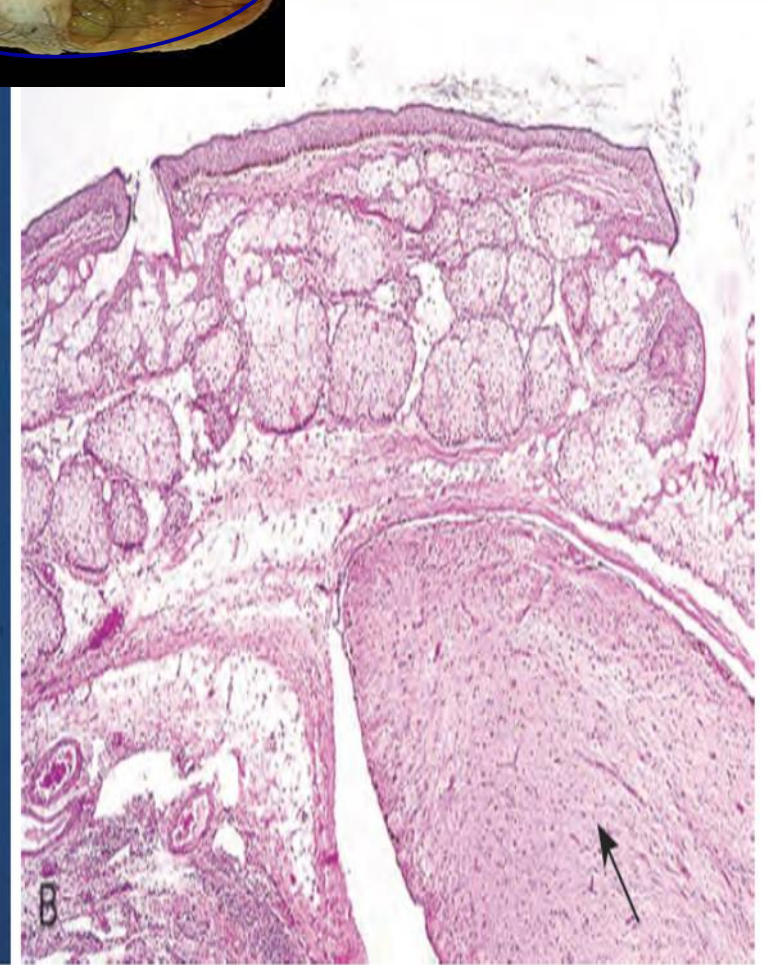


Figure 7-3 **A**, Gross appearance of an opened cystic teratoma of the ovary. Note the presence of hair, sebaceous material, and tooth. **B**, A microscopic view of a similar tumor shows skin, sebaceous glands, fat cells, and a tract of neural tissue (arrow).

# Tumors of primitive fetal origin:

(Fetal tissue) <sup>بني جنين</sup>  
↓  
Blastoma <sup>بنحطه</sup>

**Blastoma:** from **immature** tissue.

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

e.g. \* <sup>Kidney <sup>كلى</sup></sup> Nephroblastoma  
\* Retinoblastoma  
\* Hepatoblastoma → (Blastoma)

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

# Some 'tumors' are NOT true neoplasms

← أمثلة لتشوهات تشبه الأورام (Tumor) لكن هي عبارة عن تشوه أو (Reaction)

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

تشوه يعقل أشبه تشبه الورم

↓  
تكويناتهم عادي من خلايا التي تتكون موجودة بالعنق تكون الفكرة بالكمية أكثر زائد / ناقص ومبني.  
الكان صون صح بمكانها الصح  
تكون موجودة

☆  
□ **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.

← تشوه خلقي / خلايا طبيعية يوجدون من مكان غلط

بفتح (Gall Bladder) بلاقه جواه (Pancreatic tissue)

صو خلايا عادية من مكان غلط !!

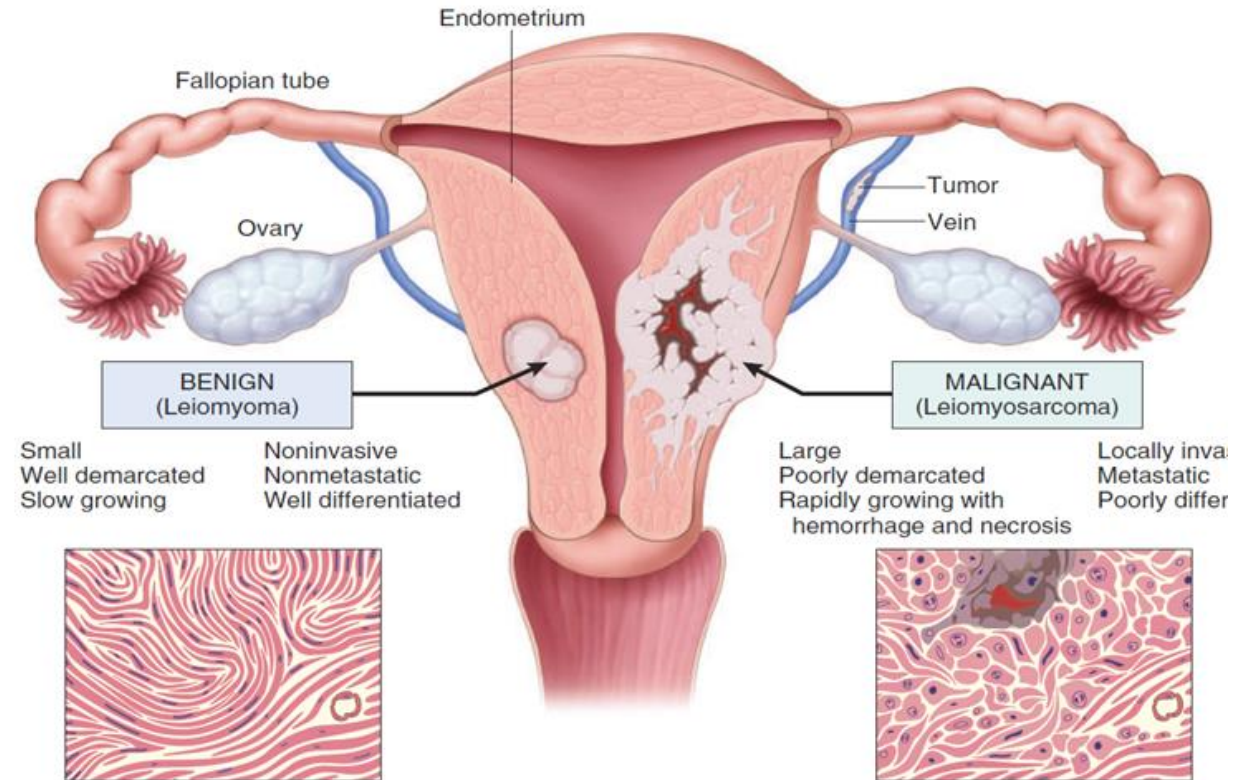


# Characteristics of benign and malignant neoplasms

کیف لیف بین الحمید و الخبیث؟

Tumors can be distinguished on the basis of:

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



قدية هاي إختلايا موجودة في الورم تتشبه خلايا الطبيعية من النامية الوظيفية ومسكليه

# 1- Differentiation:

الغنية الي بصيرلها growth

تشابه .

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

من أي نامية

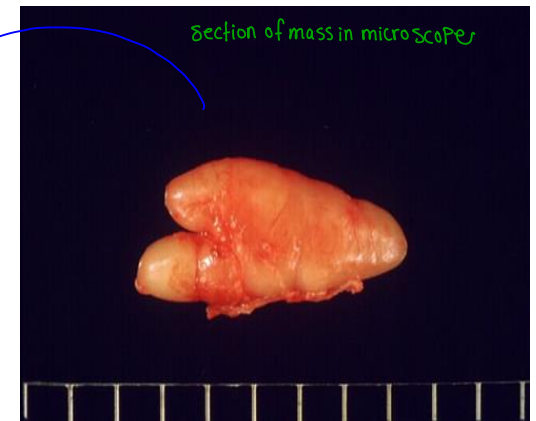
تشبه إشكل الاصلي

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

هنا يصعب التمييز من شكل الورم

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

يصعب التمييز



## Example:

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

دهن

بالمقابل يتكسب خصائص جديدة (بتميز في الحجم وبنيت)



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.

**ANAPLASIA = Severe Dysplasia: Total loss of differentiation**

مستحيل تقدير نفي

Dysplasia - loss of architectural

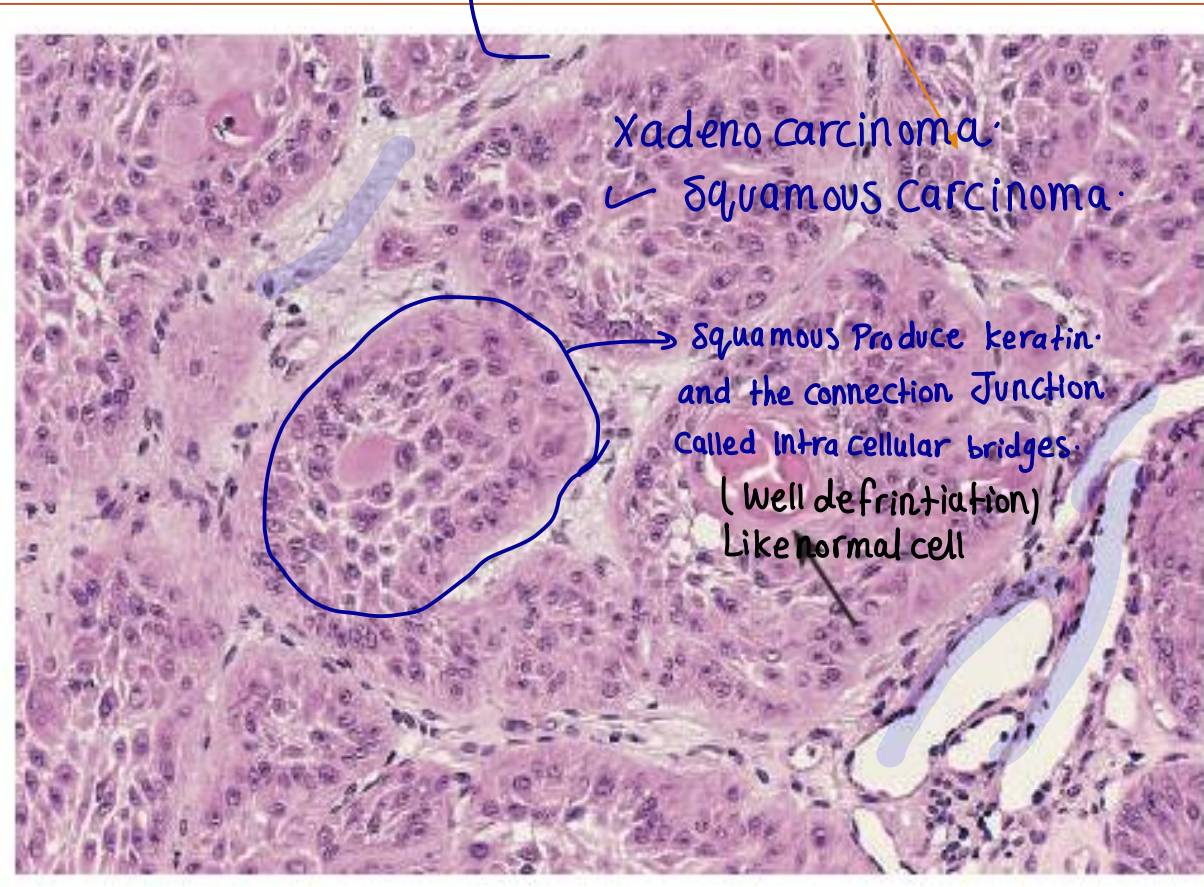
Anaplasia - severe loss ...

## □ Cytological Features of Dysplasia

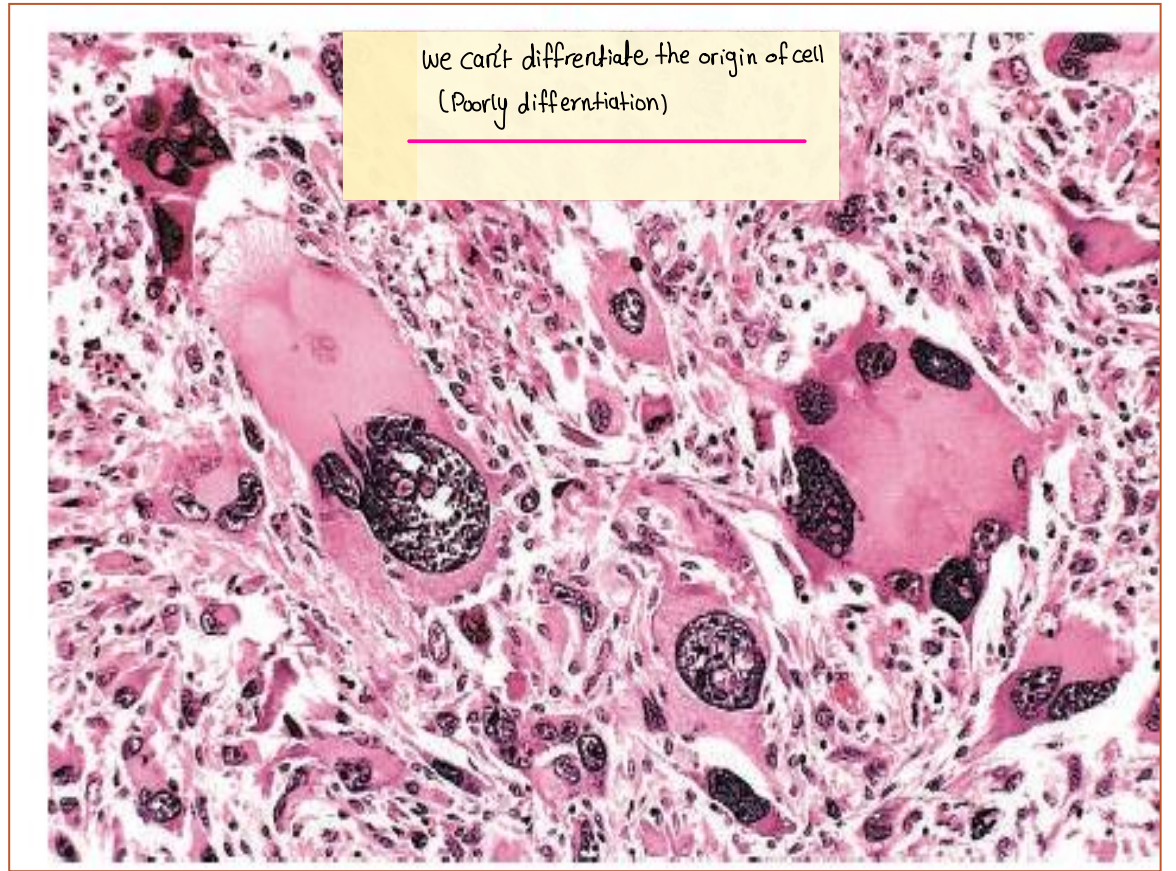
- ✦ **Increased Nuclear Size, ↑ N/C (nuclear to cytoplasmic) Ratio** ⑧
- ✦ **Pleomorphism: Variation In Nuclear & Cell Size & Shape**
- ✦ **Loss Of Differentiating Features**
- ✦ **Hyperchromasia: Increased Nuclear DNA Content.** very dark in stain.
- ✦ **Nucleoli: Prominent, May Be Multiple** Have more number.
- ✦ **Mitotic Figures: Increased** ظهور انه خلايا بتقسم قاعدة
- ✦ **Abnormal Mitoses: May Be Present**
- ✦ **Loss Of Polarity: Failure Of Orientation And Polar Arrangement Of An Epithelial Surface**

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)

هي بتحكياي حميد او خبيث



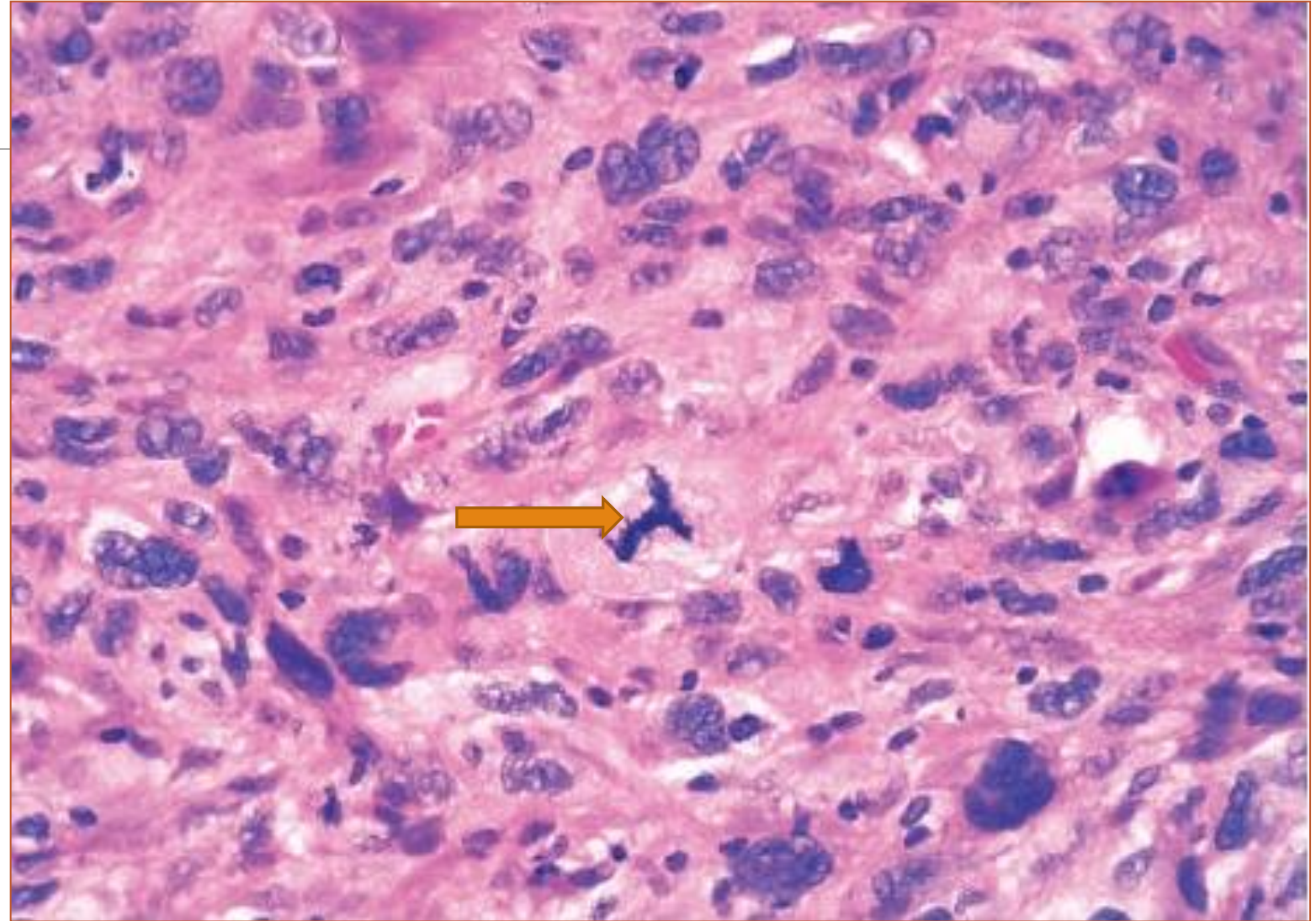
Poorly differentiated: Pleomorphic malignant tumor with marked variation in cell and nuclear sizes, the hyperchromatic nuclei, and the presence of tumor giant cells



Different size of cell.

(Poorly differentiation)

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



مهم كتابة هالوصف بالتقرير / لأنه إيداج  
تاعها غير وممكن تختيني

## Dysplasia can be:

- Mild, Moderate or Severe.

\* When dysplastic changes are marked and involving the **entire thickness** of the epithelium & associated with **an intact basement membrane**, the lesion is referred to as **severe dysplasia or carcinoma in situ (CIS)**.

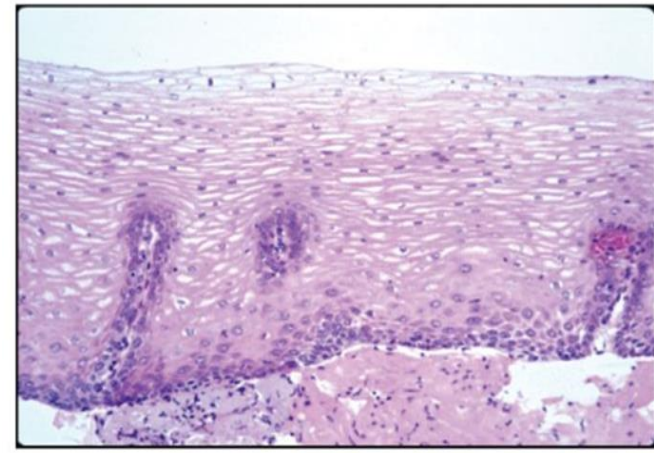
مهم ←  
تكون مأخوذة كل thickness بدون ماتزل تحت (Basement) شمت ( carcinoma in situ )

❖ Mild to moderate dysplasias sometimes regress completely if inciting causes are removed.

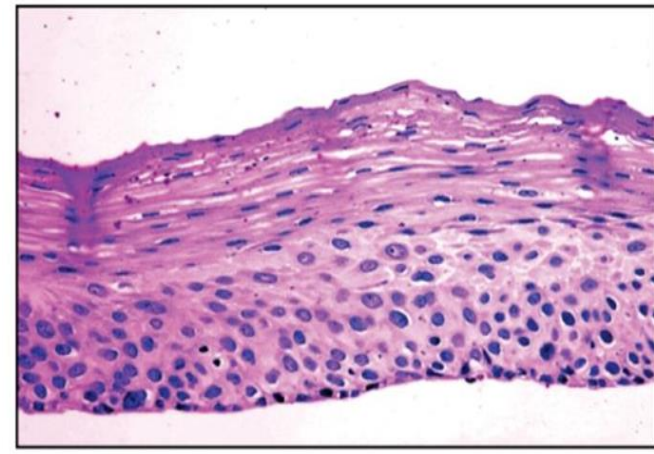
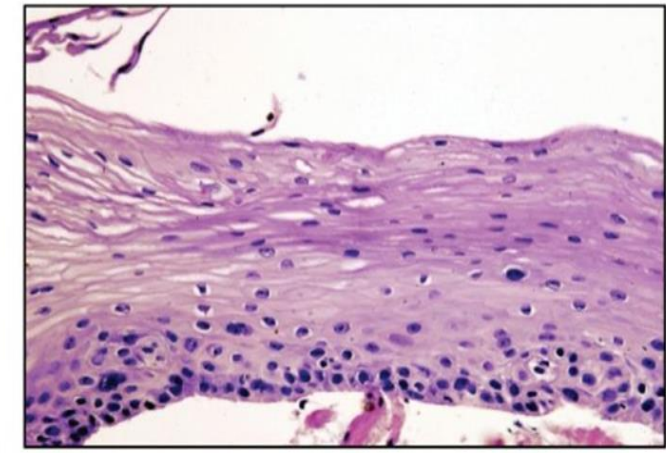
↓  
ازالة

→ Return

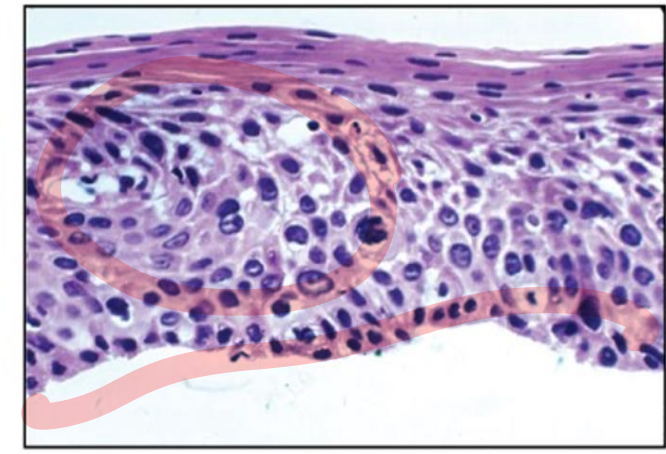
Normal



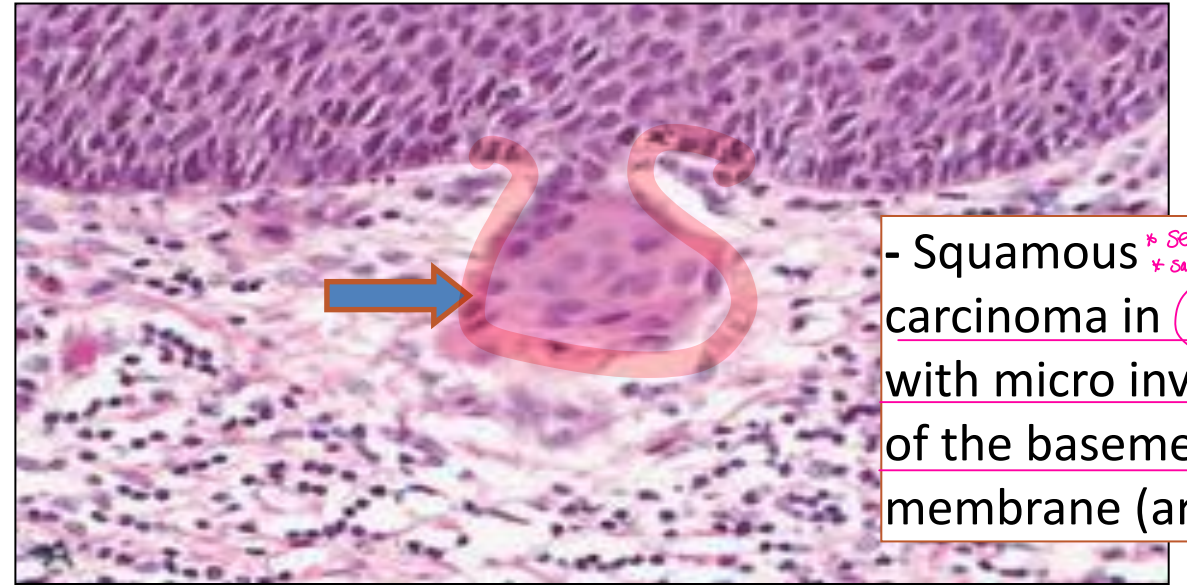
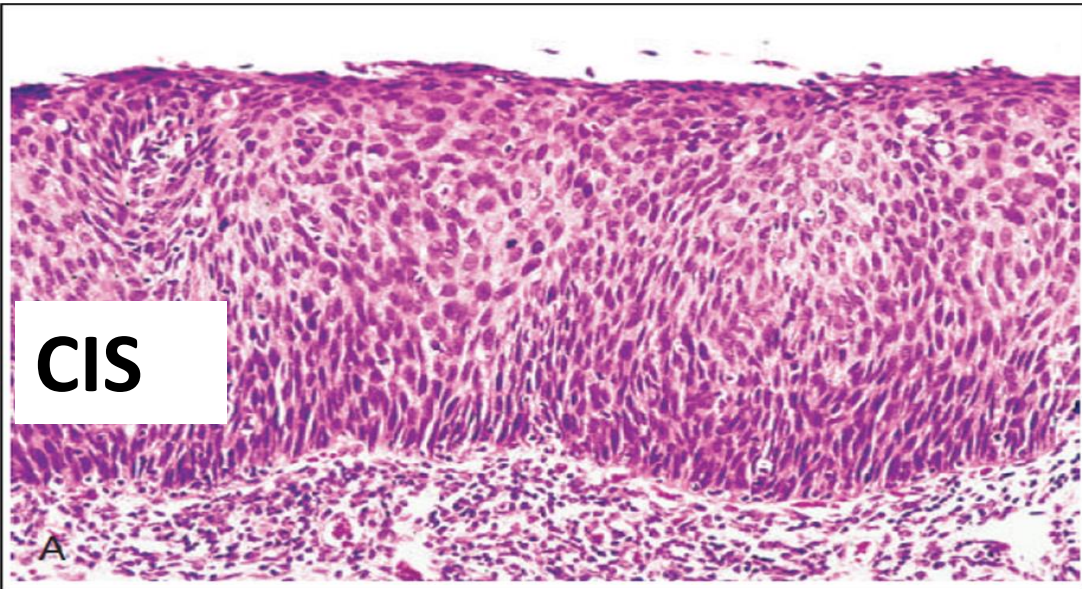
Mild dysplasia



Moderate dysplasia

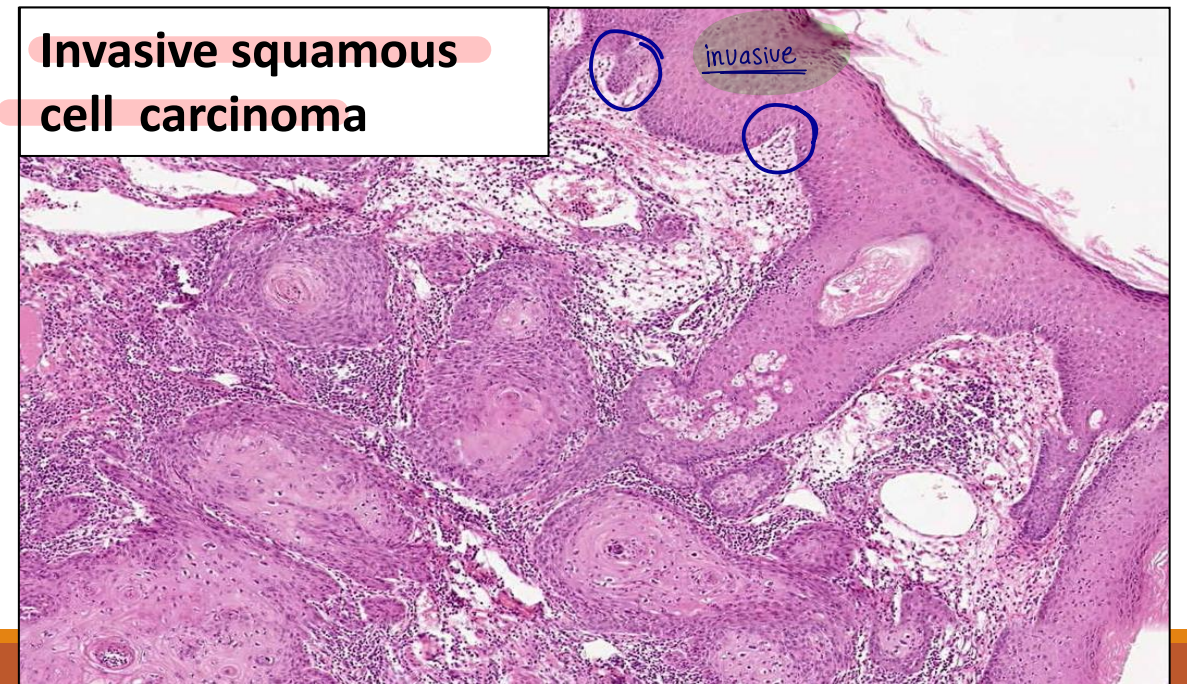
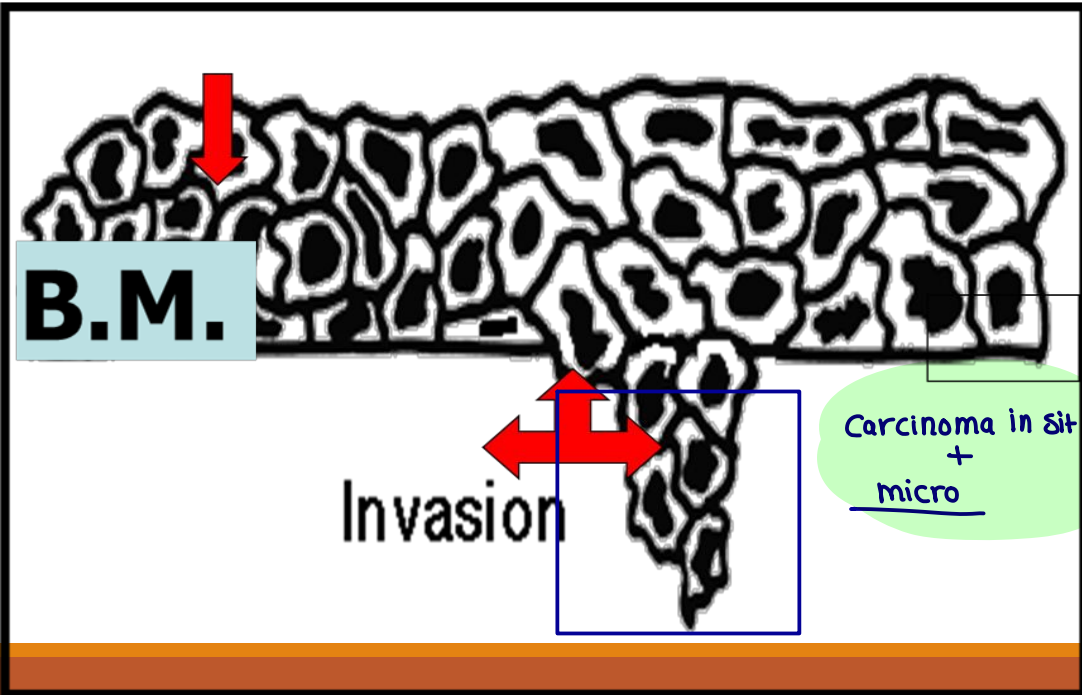


Severe dysplasia



- Squamous carcinoma in situ with micro invasion of the basement membrane (arrow)

\* Severe dysplasia  
\* Save Basement membrane





## 2- Rate of growth

ممکن تحت ہرمون معین  
یسیرلھا High 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).
  - Some malignant tumors may outgrow their blood supply --> C. ischemic necrosis, so grow slowly.

### 3- Local invasion & Encapsulation

Second important

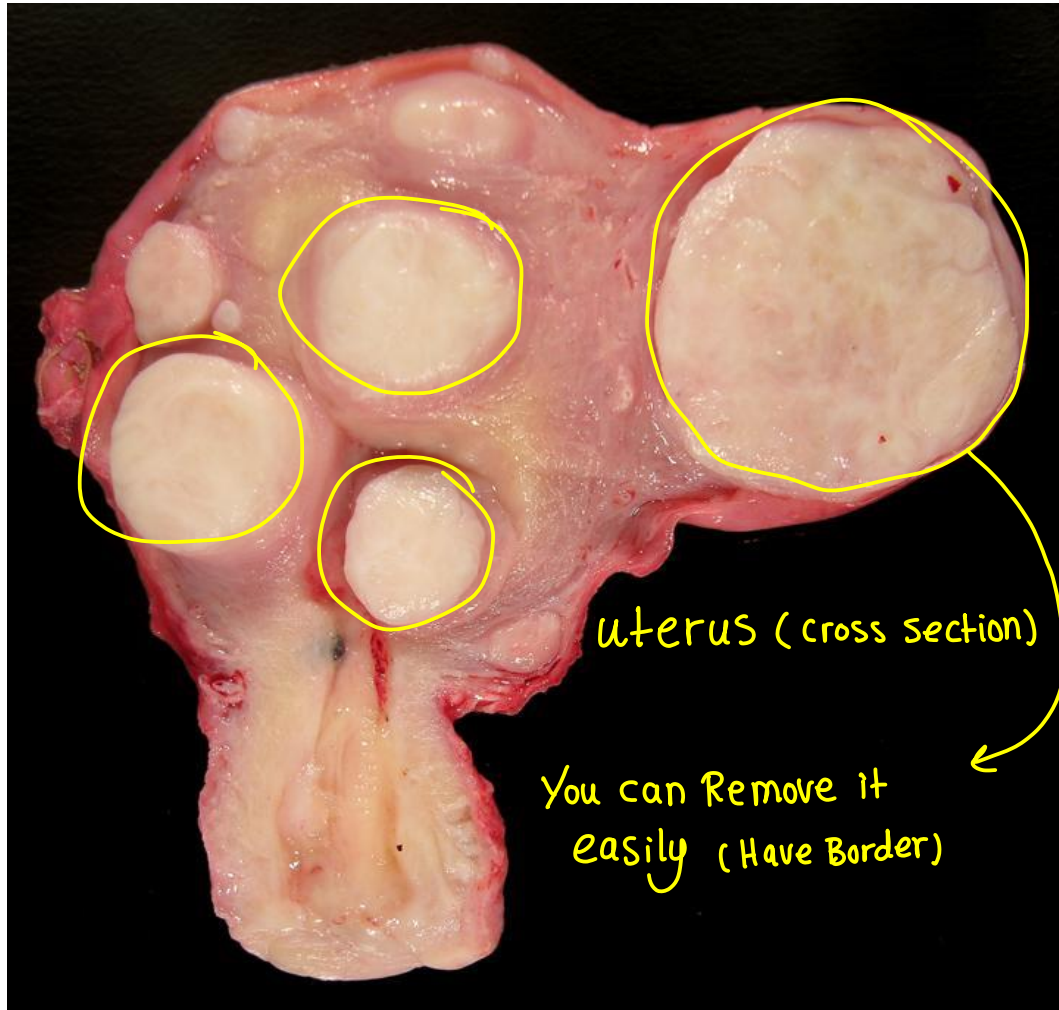
متفوق بمكانه (ما سجدى على اى حوائيه) وعليه capsule

- **Benign tumors:** frequently have a fibrous capsule or are well-demarcated and do not have the capacity to invade the normal 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.

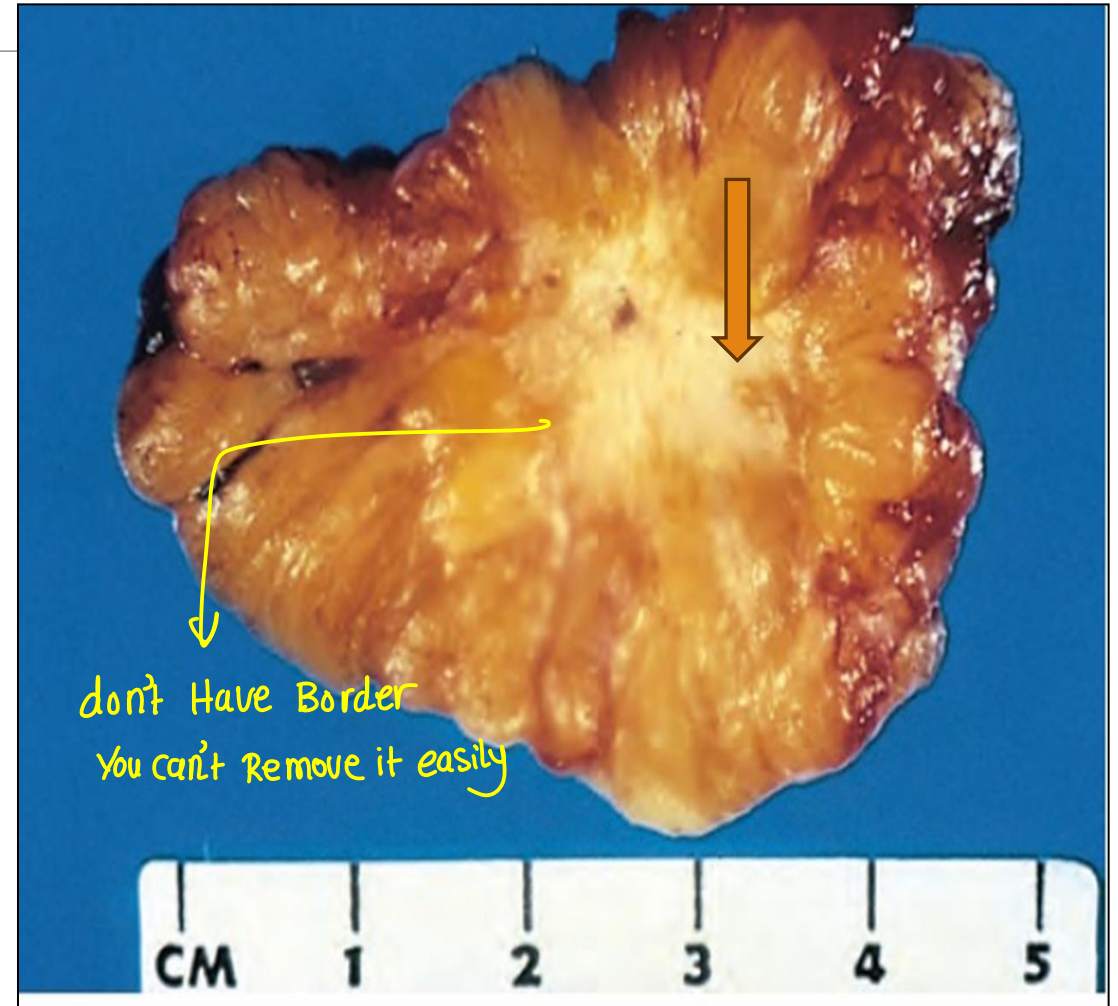
ثاني أهم سبب للتمييز

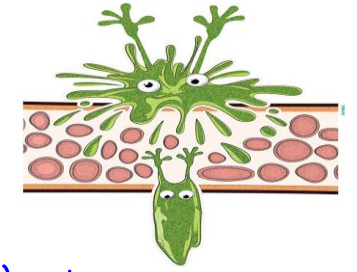
**Liomyomata:** uterus showing multiple shiny, white, well-demarcated but unencapsulated leiomyomas in the wall.



**Invasive ductal carcinoma of breast**

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





## 4- Metastasis:

مريض عنده (lung mass) ولقينا نفس هار Tumor في دماغ لكن انتشارهم كان بعيد عنه ومش مرتبط فيه .

- 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)**

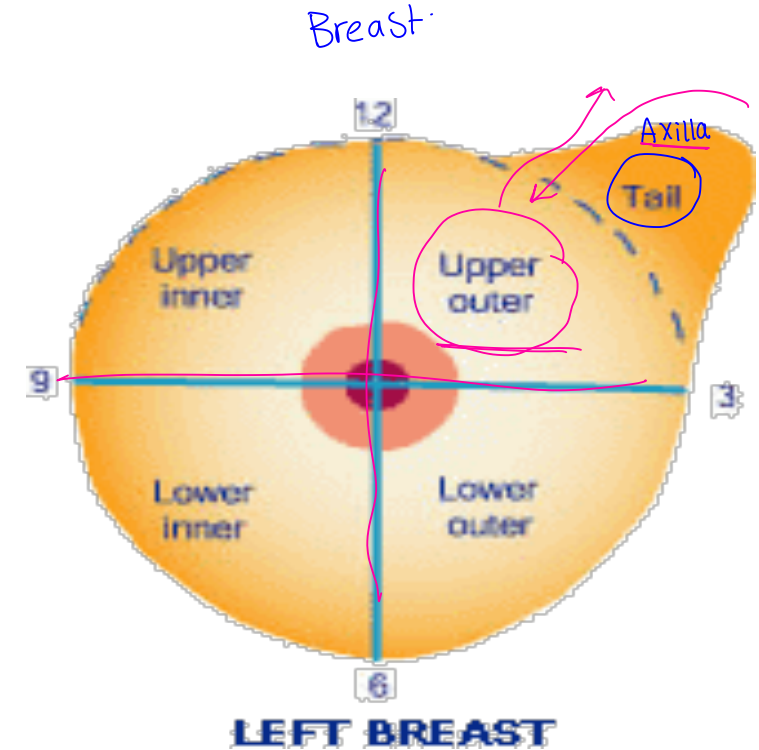
الطريقَ حتّٰى يَنْتَشِرَ لِوَرْمٍ مِمكَّانٍ بَعِيدٍ - ٩

## Routes of metastases:

### 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.

lymph channel  
لمبشوا بأقرب



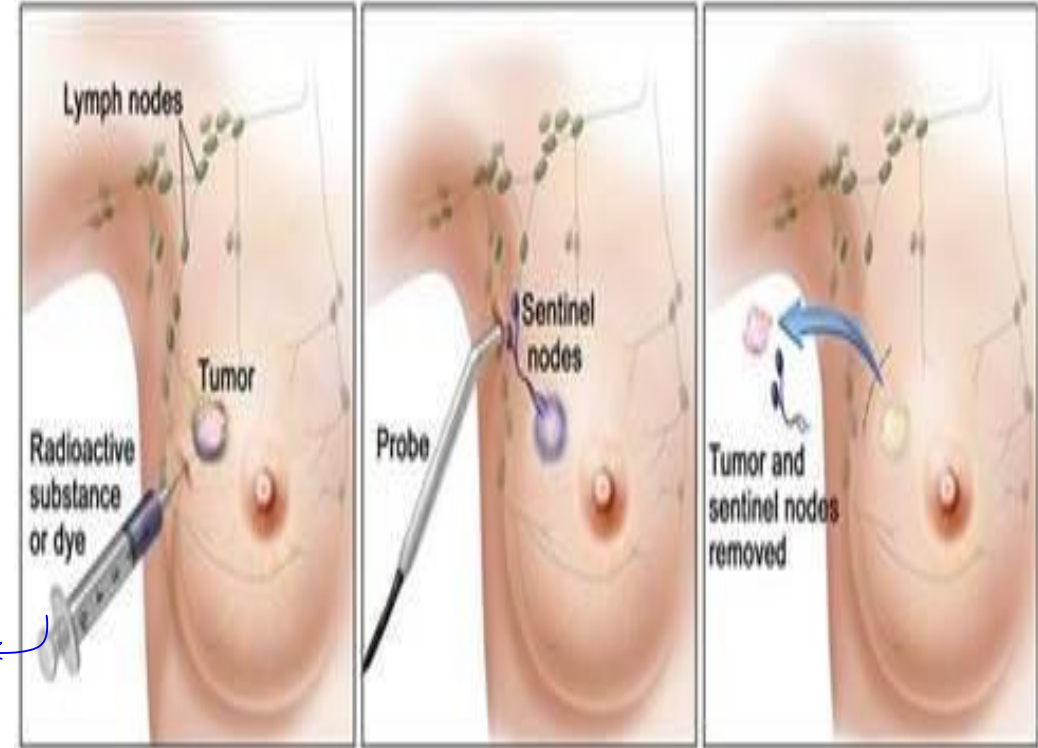
# IMPORTANT IN SURGICAL RESECTION:

أول عقدة ليمفية يوصلها الورم من مكان الورم

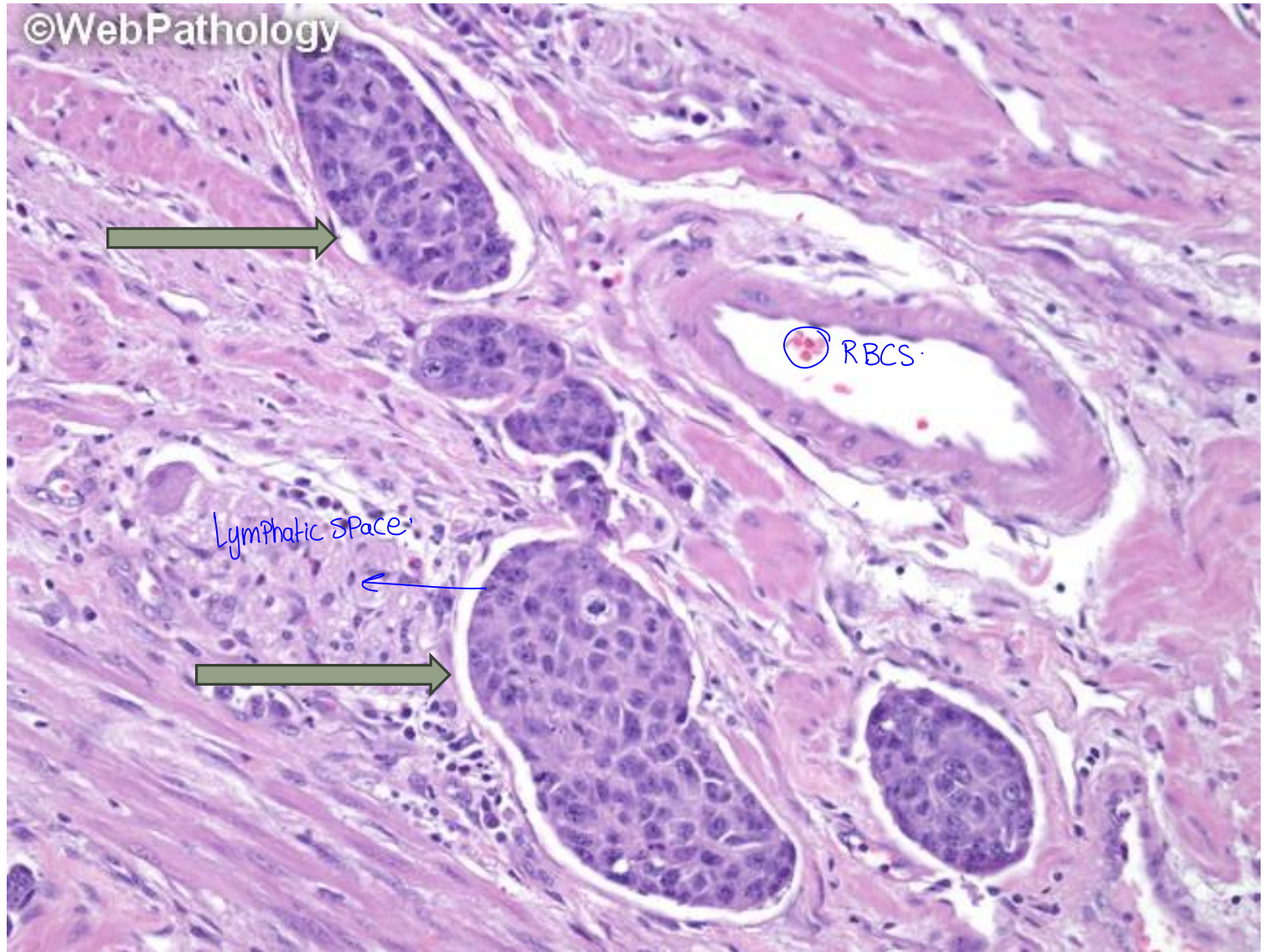
## ■ Sentinel Lymph Node:

- 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

يقع صبغة في tumor وأول عقدة ليمفية يتلون بوضعها عينة / لو ما كانت تحتوي على العنفة ما في داعي استئصال lymph لو في ممكن لا يشيل

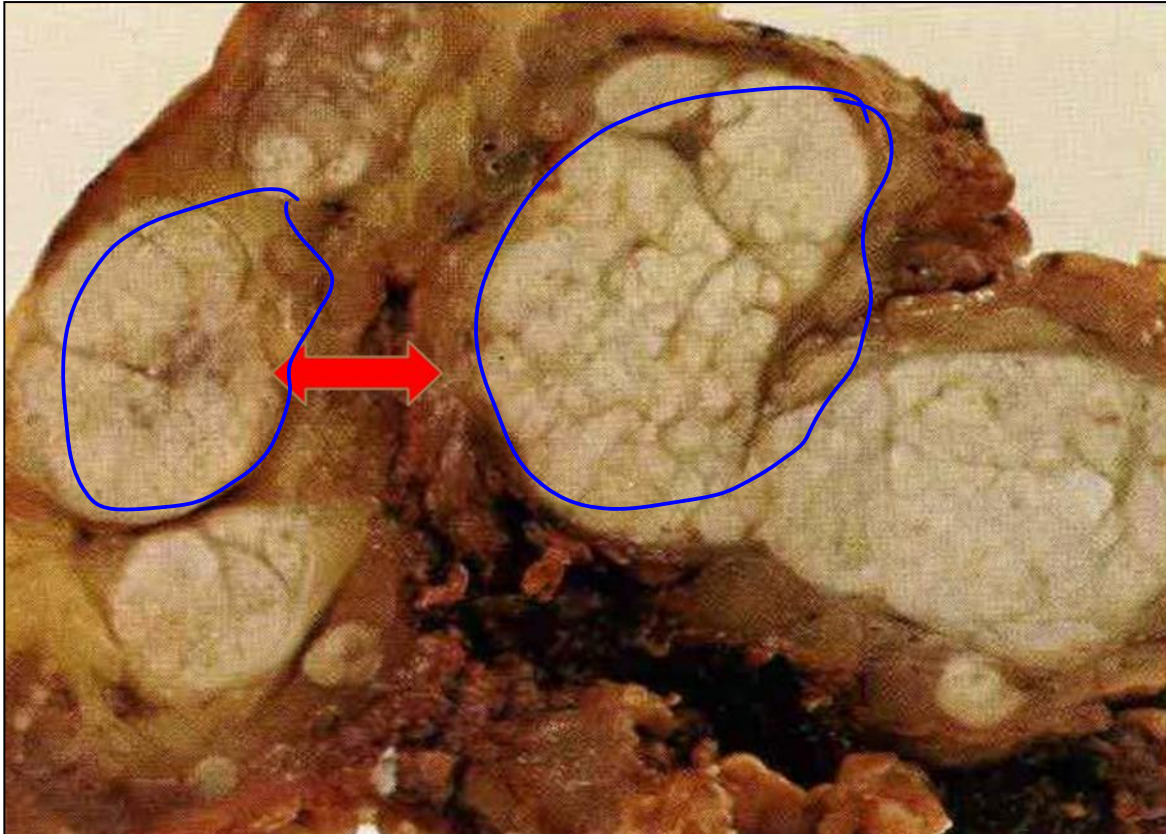


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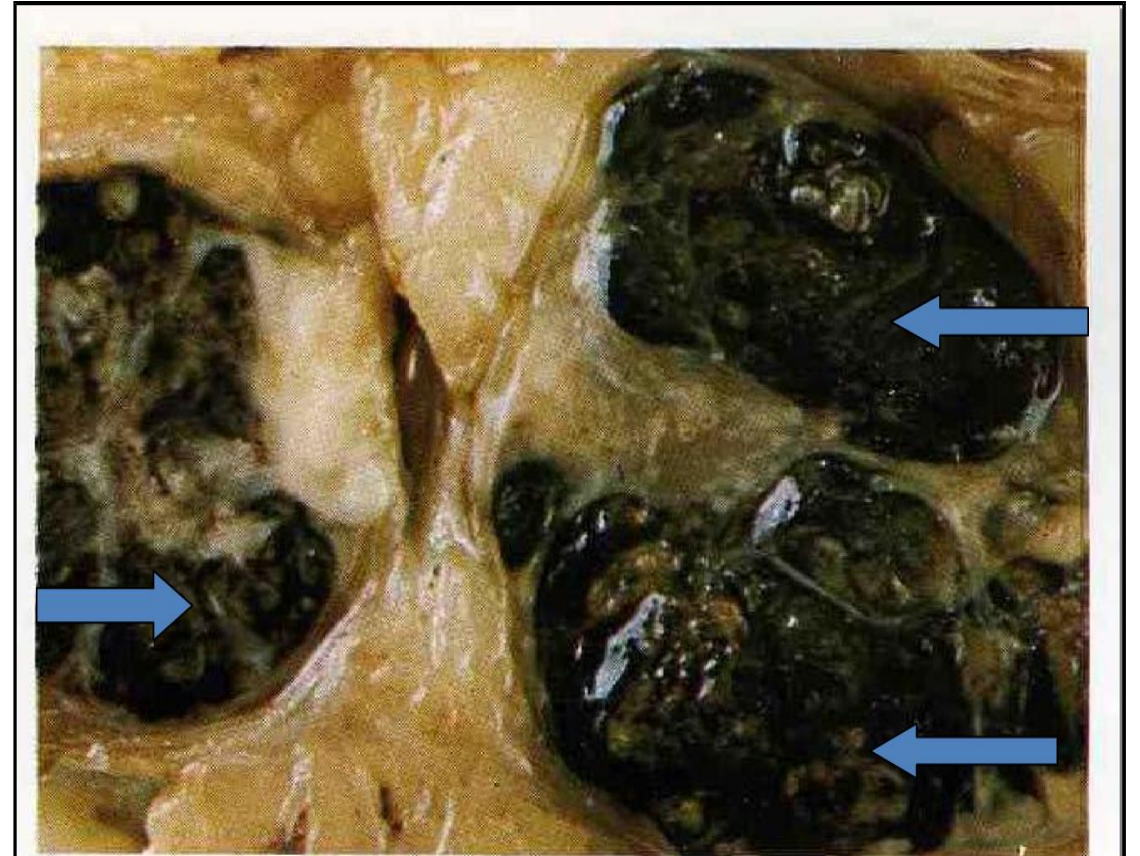


**Carcinoma:** Nests of tumor cells invading lymphatic vessels (arrows)

**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. *Black Pigment (Tumor in melanocytes)*





Carcinoma → lymph nodes

Sarcoma → Blood vessels, very rare go to by lymph nodes

exactly, (in veins); more thin.

## 2- Hematogenous spread:

Spread By B.V

■ 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.

❖ The **liver, lungs, and bones** are the commonest three sites involved in hematogenous metastatic secondaries.

metastasis: بفرز (multiple mass) لو بفرز عنده  
وليس Primary



Liver, studded with multiple whitish metastatic cancer secondaries.

### 3- Transcoelomic spread:

ممكنة لتعريف هو المحلول عليهم.

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

زي تجاوزين البطن ولرئة

- 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.

Peritoneal seeding by malignant cells of colonic adenocarcinoma

