

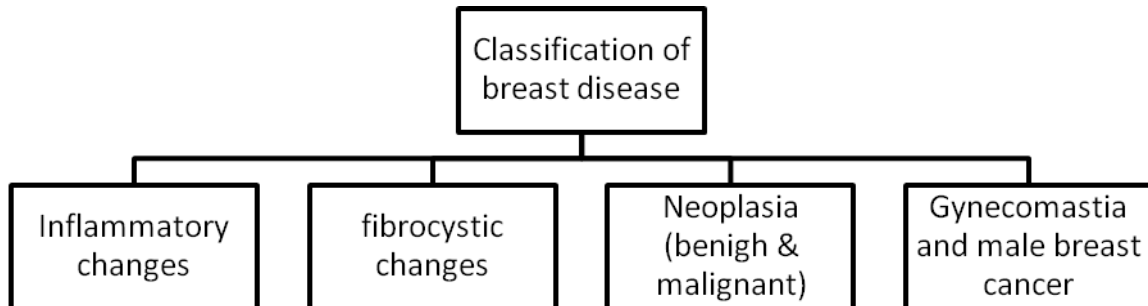
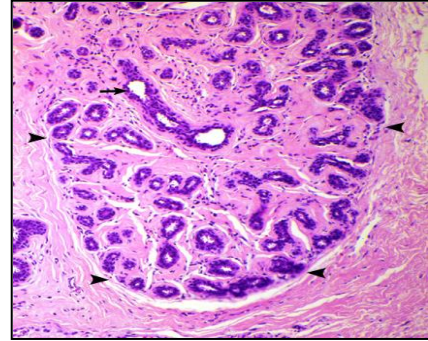
## Pathology of breast cancer

### - Structure of the breast:

- \* It rests on the chest wall (pectoralis major muscle and fascia).
- \* From the 2<sup>nd</sup> to the 6<sup>th</sup> rib, and from the lateral aspect of the sternum to the midaxillary line.
- \* It is composed of 15-20 lobules and each lobule has its own lactiferous duct which will open in lactiferous sinuses in the nipple.

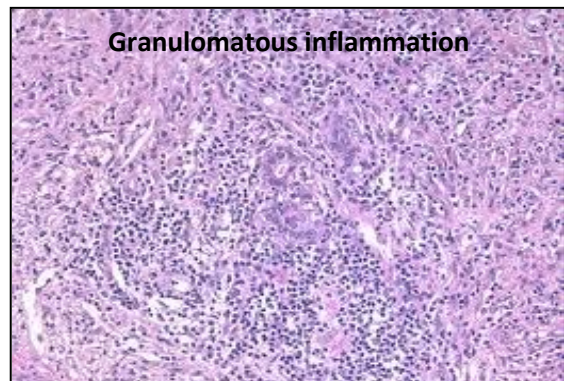
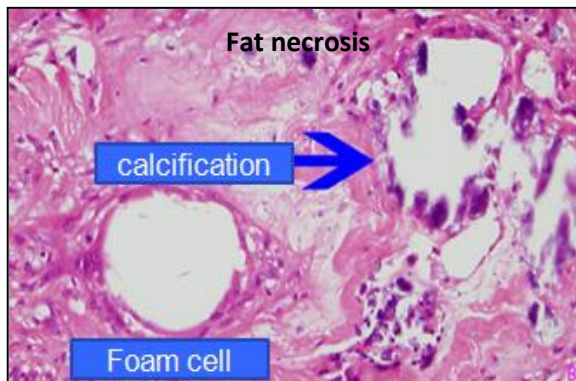
### - Histology of the breast:

- \* The duct are composed of 2 layers:
  - # The epithelium: which give rise to ductal carcinoma.
  - # The myoepithelial cells.
- \* Lobular carcinoma arises from the acini (alveoli which secrete milk).
- \* Intralobular connective tissue (stroma) will give rise to benign tumor fibroadenoma.



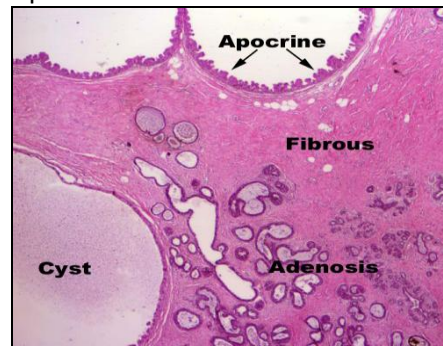
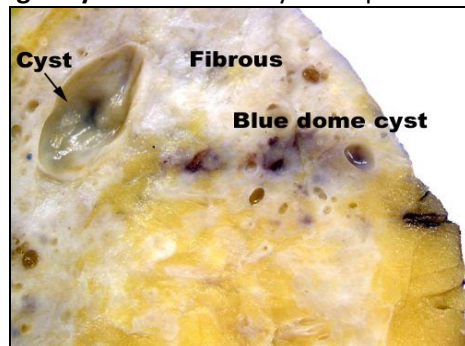
### - Inflammatory lesions:

- \* **Acute mastitis:** due to bacterial infection (*Staphylococcus aureus*) which might result in the formation of abscess.
- \* **Fat necrosis:**
  - # It is a benign lesion which presents as a lump in the breast & appear calcified in x-ray.
  - # Characterized by the formation of foam cells, presence of giant cells, neutrophils, blood, fibroses & calcification.
- \* **Granulomatous mastitis:**
  - # It is caused by hypersensitivity reaction & presented clinically as a lump.
  - # Formation of granuloma which is also seen in other disease such as Tb and sarcoidosis.
  - # Characterized by the presence of epithelioid cells + infiltration of lymphocytes.



- **Fibrocystic changes:**

- \* Presented clinically as a lump associated sometimes with brownish discharge from the nipples.
- \* **Cause:** hormonal effect of estrogen.
- \* **Classified to:**
  - # **Simple:** no hyperplasia.
  - # **Proliferative:** hyperplasia with increased risk of malignancy. (note: atypical hyperplasia is associated with increased risk of malignancy more than normal hyperplasia "5 times compared with 1.5-2).
- \* **Grossly:** cyst (filled with fluid or solid material) + fibrosis (appear white in color).
- \* **Histologically:** formation of cysts + apocrine metaplasia + fibrosis in stroma + adenosis.

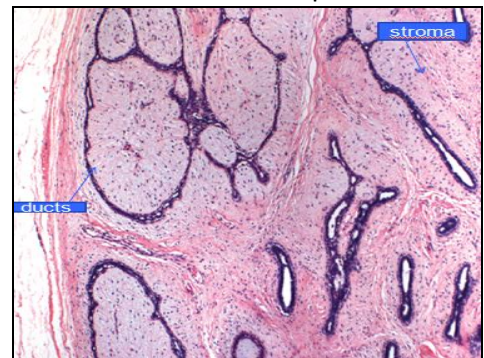
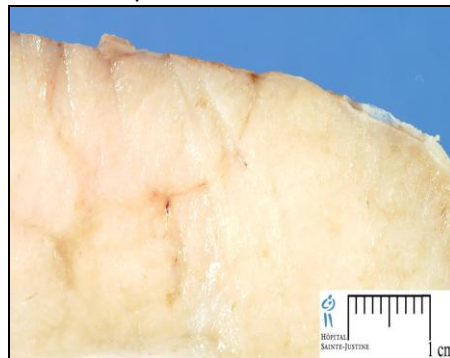


- **Neoplasia:**

**1) Benign tumors:**

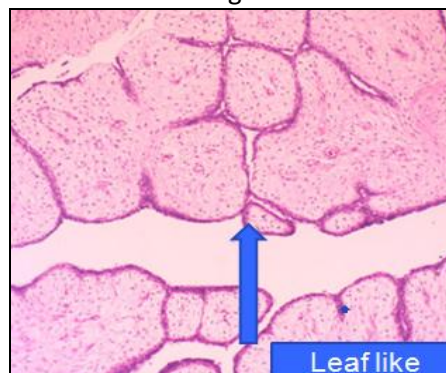
\* **Fibroadenoma:**

- # Presents clinically as a mobile breast lump especially in young women.
- # It increases in size during pregnancy and lactation (hormonal effect).
- # **Grossly:** defined margins with whitish appearance and slit like spaces.
- # **Histologically:** proliferation of the intralobular connective tissue (stroma) which will push the ducts and thus they will lose their normal shape.



\* **Phyllodes tumor:**

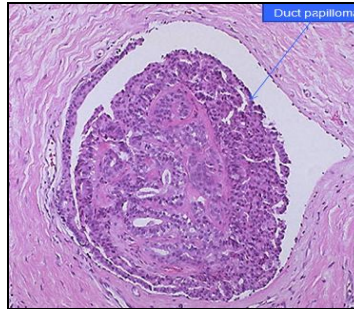
- # Majority are benign. Some can be malignant spreading through hematogenous route (blood stream) to distant sites.
- # It is resembling fibroadenoma but characterized by stromal proliferation (in a leaf-like pattern) + mitosis and the margins of the tumor are not well-defined.





**\* Intraductal papilloma:**

- # Arising usually in the main ducts (lactiferous ducts)
- # It is a tumor with finger-like processes.
- # Presented clinically as a small subareolar tumor with bloody discharge (and rarely nipple retraction).
- # Histologically: a mass with finger-like processes inside the lumen of the duct

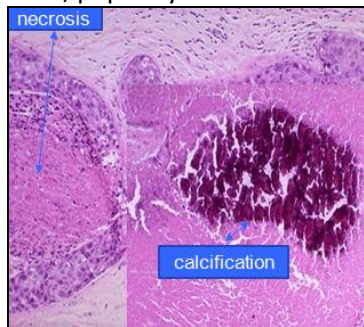


**2) Malignant tumors (50% in the upper outer quadrant of the breast):**

**\* Non-invasive carcinoma of the breast (tumors limited by the basement membrane):**

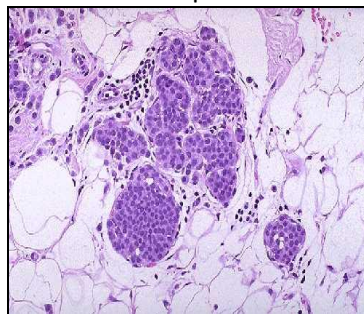
**# Ductal carcinoma in situ:**

- ✓ Comedo: large high-grade tumor with necrosis and calcification.
- ✓ Non-comedo: low-grade tumor with no necrosis. It includes solid, papillary and cribriform tumors.



**# Lobular carcinoma in situ:**

- ✓ Monomorphic population of small, rounded loosely cohesive cells fills and expands the acini of a lobule.



**# Paget's disease:**

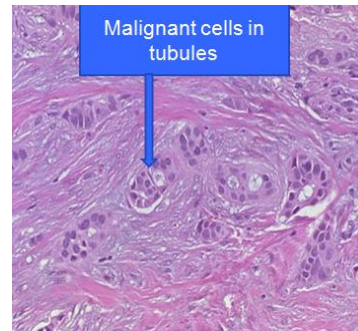
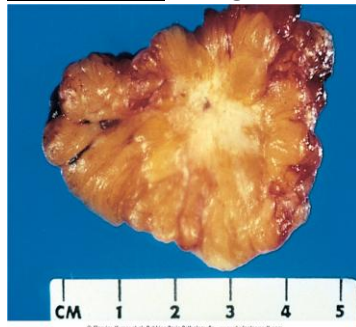
- ✓ The skin of the nipple is eroded with the formation of ulcers & it indicated the presence of ductal carcinoma.



**\* Invasive carcinoma (infiltrating to surrounding tissues):**

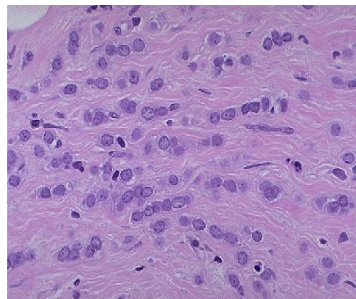
**# Invasive ductal carcinoma:**

- ✓ Strong hard mass with large amount of fibrous stroma.
- ✓ It can be fixed to the overlying skin of the breast or to the chest wall.
- ✓ Grossly: necrotic centers with no well-defined margins.
- ✓ Histologically: malignant cells in tubules in a fibrous stroma.



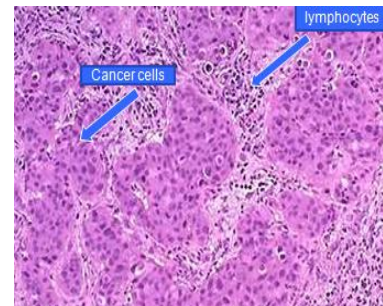
**# Invasive lobular carcinoma:**

- ✓ More than one mass and it can be bilateral.
- ✓ Histologically: small cells arranged in chains or cords (Indian-file) with no formation of tubules.



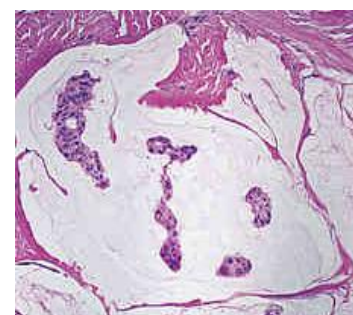
**# Medullary carcinoma:**

- ✓ Grossly: large, well-defined soft mass.
- ✓ Histologically: high-grade tumor cells with pleomorphic nuclei and lymphocytes infiltrating at the periphery of the tumor.
- ✓ Better prognosis compared with invasive ductal carcinoma.



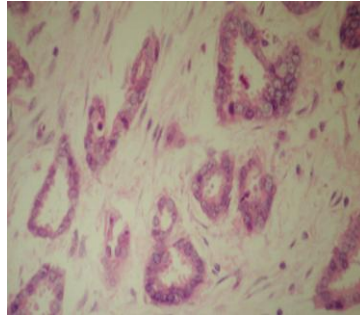
**# Mucinous (colloid carcinoma):**

- ✓ Grossly: soft gelatinous circumscribed mass found in post-menopausal women.
- ✓ Histologically: tumor cells floating in mucin.
- ✓ Good prognosis.



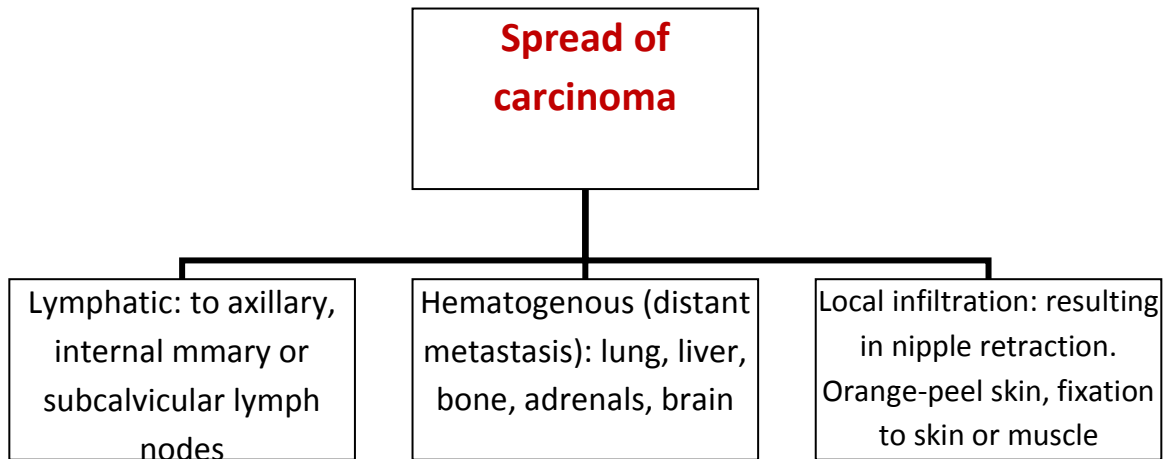
**# Tubular carcinoma:**

- ✓ Small circumscribed hard tumor.
- ✓ Histologically: well formed tubules in a dense stroma with little pleomorphism.
- ✓ Good prognosis.



**# Inflammatory carcinoma:**

- ✓ Presents clinically as an inflammatory lesion
- ✓ Breast is edematous and red.
- ✓ Aggressive with poor prognosis.



**- Prognostic factors:**

- Stage of tumor (size, nodes, metastasis).
- Histologic grading (well, moderately or poorly differentiated). Grading is done using 3 criteria: tubule formation, frequency of cell mitosis and nuclear pleomorphism.
- Histologic type.
- Presence of estrogen and progesterone receptors: denotes better prognosis and respond to the treatment by tamoxifen.
- Nottingham prognostic index.

<b>Staging of breast cancer</b>	
<b>STAGE-I</b>	< 2 cm / no lymph node / no metastasis
<b>STAGE-II</b>	> 2 cm - < 5 cm / 1-3 lymph nodes / no metastasis
<b>STAGE – III</b>	> 5 cm / 1-3 lymph nodes / no metastasis
<b>STAGE – IV</b>	Any size / ± lymph nodes / distant metastasis

**- Her-2-neu:**

- Cell surface receptor expressed by tumor cells.
- Overexpression is associated with poor prognosis.
- Respond to the treatment with herceptin.

