



Lecture 8

Benign Breast Diseases



432 Pathology Team

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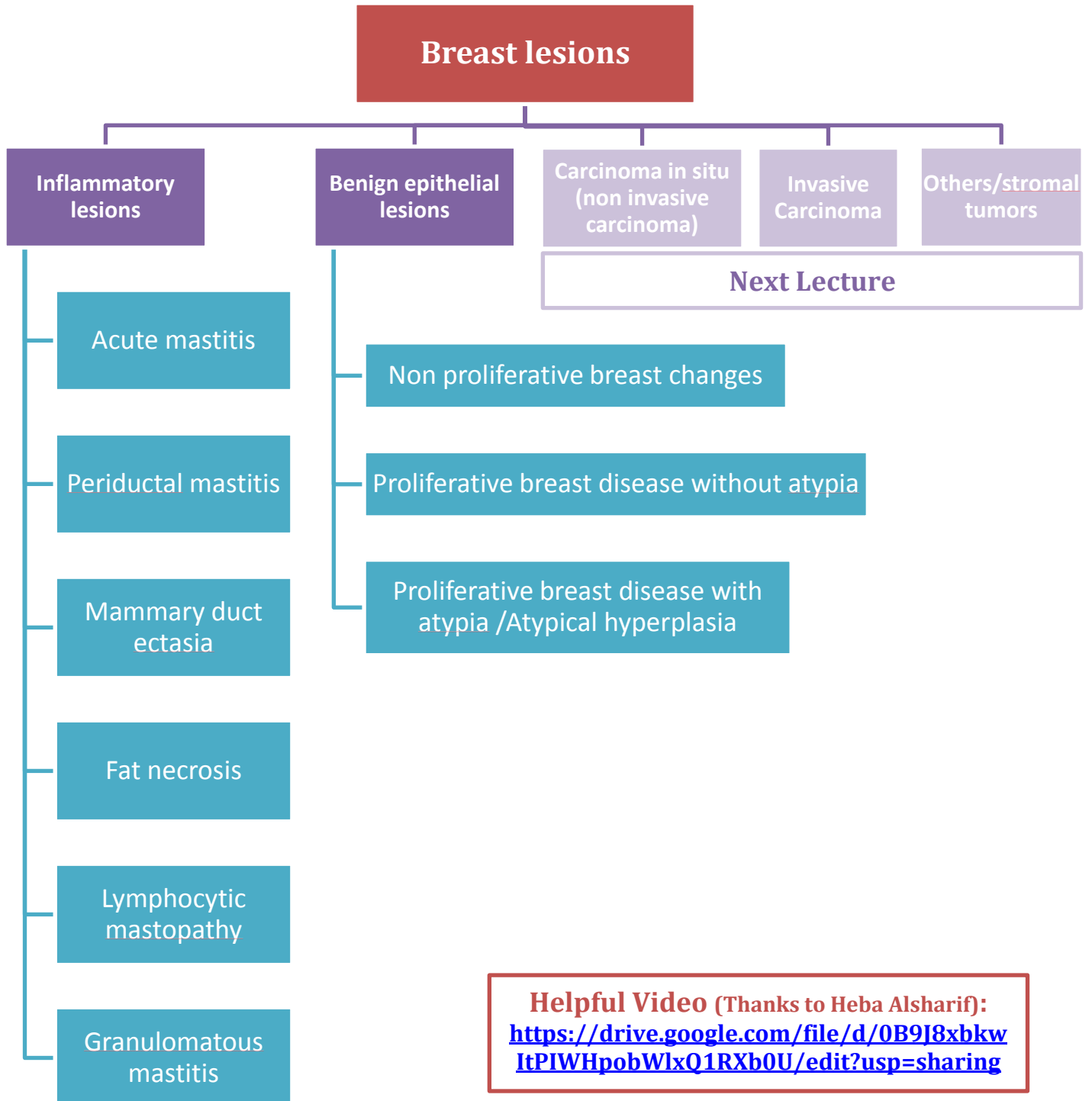
Reviewed By: Amal Al-Sinan

Reproductive Block



Benign Breast Diseases

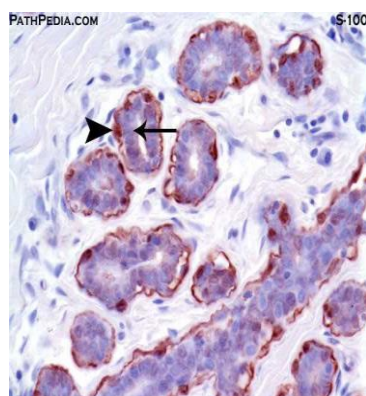
Mind Map:



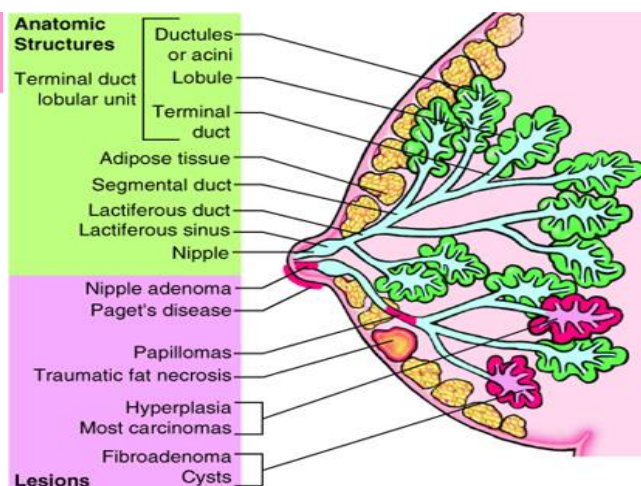
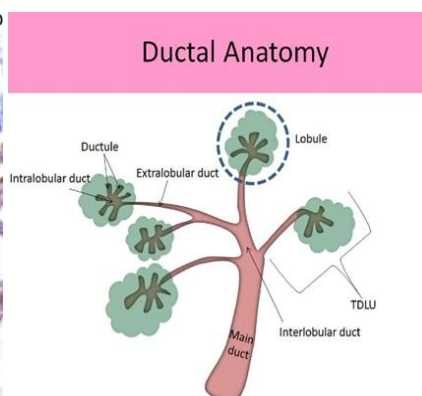
Introduction

Anatomy & Histology with clinical importance:

- Each Breast is formed of: around 10 lobes > many lobules > many ducts (major > interlobular (extralobular) > intralobular ducts) > many acini.
- The ducts eventually will lead up to the lactiferous ducts which open into the nipple.
- The acini are lined by a **bilayered epithelial and myoepithelial cells**. The S100 immunohistochemical stain shows a complete outer layer of myoepithelial cells.
- Ducts: Six to ten major ductal systems originate at the nipple. Branching of the large ducts leads to the **terminal duct lobular units**. The TDU branches into grapelike clusters of small acini to form the lobule.



acinus



Pathology based on location

Clinical Presentation of Breast Diseases:

- Pain (**mastalgia**): is the most common breast symptom and may be cyclical with menses or noncyclical. Diffuse cyclical pain has no pathologic significance. Non-cyclical pain is usually associated with a focal site in the breast. Causes include ruptured cysts or areas of prior injury or infection, or sometime no specific cause. Although **the great majority of painful masses are benign (so pain considered as a good sign)**, about 10% of breast cancers present with pain, and all masses need to be investigated.
- Palpable mass
- Nipple discharge:
 - Milky discharge: has not been associated with malignancy.
 - Bloody or serous discharges: are most commonly associated with benign lesions but, rarely, can be due to a malignancy.

Mammographic screening:

It was introduced in the 1980s as a means to detect small, non-palpable, asymptomatic breast carcinomas. The value of mammography lies in its ability to identify small, **non-palpable** cancers. The principal mammographic signs of breast carcinoma are densities and calcifications:

1. **Densities (mass):** Mammographic densities can be produced by **invasive carcinomas, fibroadenomas, or cysts**. Most neoplasms are radiologically **denser** than the intermingled normal breast tissue.
2. **Calcifications:** form on secretions, necrotic debris, or hyalinized stroma.
 - Benign calcifications are often associated with **apocrine cysts, fibroadenomas, and sclerosing adenosis**.
 - Malignancy Calcifications are usually small (**microcalcifications**), irregular, numerous, and clustered. **Ductal carcinoma in situ** (DCIS) is most commonly detected as mammographic calcifications. Mammographic screening has increased the diagnosis of DCIS. (in general calcifications are more serious than densities, with a higher possibility to indicate cancer).

Screening is generally recommended to start at age 40. Younger women usually undergo mammography only if they are at high risk for developing carcinoma.

Inflammatory lesions:

- a) **Acute mastitis:** almost always occur during 1st month of breastfeeding. **Staphylococcus aureus** is the most common causative organism. The breast is erythematous and painful, and fever is often present.
- b) **Periductal mastitis:** not associated with lactation. There is strong association with cigarette smoking. It has been suggested that the vitamin A deficiency associated with smoking or toxic substances in tobacco smoke alter the differentiation of the ductal epithelium.
- c) **Mammary duct ectasia** means dilated ducts disease (old females present with mass or nipple discharge – **comedo discharge = to the one with DCIS**).
- d) **Fat necrosis:** is usually due to mechanical trauma, surgical or otherwise.
- e) **Lymphocytic mastopathy:** (sclerosing lymphocytic lobulitis) seen in diabetics.
- f) **Granulomatous mastitis:** sarcoid, TB, etc., but mostly idiopathic.

Benign epithelial lesions

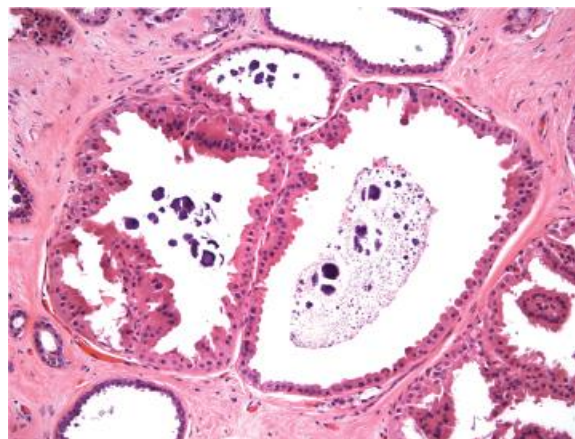
1- Nonproliferative Changes (Fibrocystic Changes):

- It is the single **most common disorder of the breast**.
- Older terminology is fibrocystic changes/disease—more recently referred to as non-proliferative changes/disease. “Changes” is generally considered to be more appropriate terminology than “disease” because the alterations are present in most women and are **not associated with any risk of progression or development of cancer** – better to say the risk is normal but not zero.
- Thought to be caused by **hormonal imbalances** e.g. relative \uparrow in estrogens or \downarrow of progesterone, or abnormal end-organ metabolism of the hormones. However the exact cause is not known.
- Affect ages between 20-55yrs, decreases progressively after menopause.
- Could produce **palpable breast mass, mammographic densities, calcifications, nipple discharge** or maybe **pain**, which may be cyclical. So, present as any cancer.

Three patterns of morphologic changes:

- **Cysts formation and apocrine metaplasia:** small to big in size, lined by benign **flattened to columnar** epithelium with apocrine metaplasia (large polygonal cells with abundant, eosinophilic cytoplasm) containing semi-translucent or turbid fluid. The cysts can rupture and cause inflammation. (**Unopened cysts are called blue dome cysts**).
- **Fibrosis** : contribute to the palpable firmness of the breast
- **Adenosis:** **Increase in the number of acini** per lobule (note adenosis can be seen in **pregnancy**).

If in an MCQ was only written “fibrocystic changes” it means non- proliferative changes.

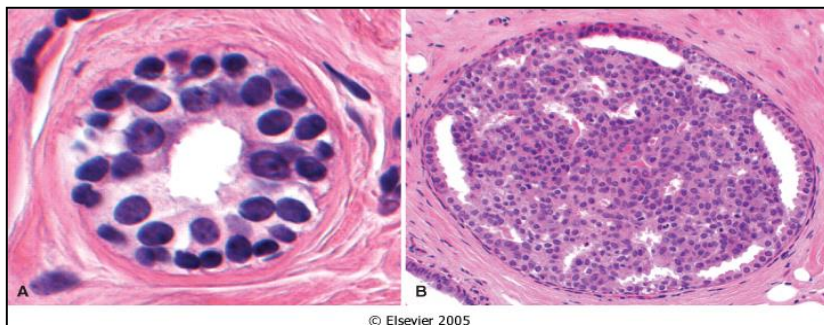


2- Proliferative Disease without Atypia:

- Rarely form palpable masses, **Incidental finding** as **mammographic densities**.
E.g. Large duct papilloma present in 80% as nipple discharge.
- Risk for cancer is **1.5 – 2 times** normal. **Very important**.
- **The following entities are included in this category:**

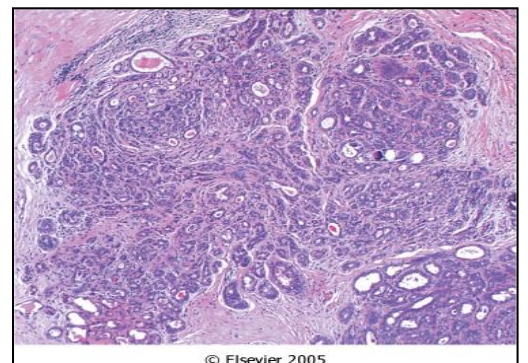
a) Epithelial Hyperplasia (usual epithelial hyperplasia):

- Defined as the presence of **more than 2 layers** of cells (**normal breast has only 2 layers epithelial and myoepithelial cells**).
- **Both layers** epithelial and myoepithelial cells **proliferate**.
- Can be seen in the ducts and the lobules and may fill and distend them.
- It can be seen in fibrocystic disease in which case the fibrocystic disease becomes of the proliferative type.
- Hyperplasia ranges from mild, moderate to **florid** (**florid means very severe**).
- **Note:** **No atypical architectural or cytologic features are present**



b) Sclerosing Adenosis:

- Often occurs as an incidental microscopic finding but may manifest as a palpable mass that may be **mistaken clinically for cancer**.
- It is almost always associated with other forms of fibrocystic change.
- **Diffuse micro-calcifications** are commonly seen in the lesion, which **may mimic carcinoma on mammography**.
- **Histological examination:** The involved terminal duct lobular unit is enlarged due to **increase in number of acini** (adenosis) and the acini are **compressed** and distorted by the surrounding **dense stroma**.

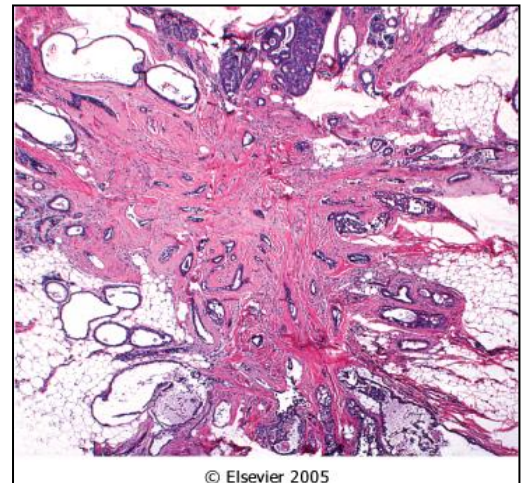


(In Sclerosing Adenosis the proliferation can mimic the breast cancer because of **the fine micro-calcifications** during mammography which is the most important clinical feature of carcinoma in situ)

c) Complex Sclerosing Lesion (Radial Scar):

- Radial scars are **stellate** lesions characterized by a central nidus of entrapped glands in a hyalinized stroma. **very important because it's usually get confused with cancer because of the fibrosis and the firm mass.**
- These lesions typically present as an **irregular** mammographic density and closely **mimic an invasive carcinoma**. can resemble irregular invasive carcinomas mammographically or on gross examination.
- "Scar" refers to the morphologic appearance, as these lesions are not associated with prior trauma or surgery.

Histologic examination: centralnidus (nests like) consisting of small tubules entrapped in **a dense fibrotic stroma** surrounded by **radiating arms of epithelium** with varying degrees of cyst formation and hyperplasia.



d) Papillomas:

- Is a papillary tumor that arises **from the duct epithelium** including large ducts.
- Commonly (75%) solitary, situated in the central part of the breast in lactiferous sinuses of the nipple, but they can be seen in any quadrant. **Subareolar with Nipple discharge**, which may be **bloody**, is the **most common presentation for central papillomas** and less commonly of peripheral tumors.
- Small duct papillomas can also occur, most commonly multiple and located deeper within the ductal system. Small duct papillomas have been shown to **increase the risk** of subsequent carcinoma.
- Age range is from 30 to 50 years.

e) Proliferative variant of fibrocystic disease.


3- Proliferative breast disease with atypia (Atypical hyperplasia):

- Risk for cancer is **4-5 times** normal. **Very important.**
- Atypical hyperplasia has some of the architectural and cytologic features **that can resemble ductal carcinoma in situ (DCIS) or lobular carcinoma in situ (LCIS) but lacking sufficient qualitative or quantitative features for a diagnosis of carcinoma in situ.**
- **Include two entities:**
 1. Atypical ductal hyperplasia
 2. Atypical lobular hyperplasia
- Atypical hyperplasia has some of the architectural and cytologic features of carcinoma in situ but lack the complete criteria for that diagnosis and is categorized as ductal or lobular in type.

Notes from Robbins:

- Estrogenic therapy and oral contraceptives do not seem to increase the incidence of fibrocystic changes, and oral contraceptives may, in fact, decrease the risk. p705

Summary

Pathologic lesion	Relative risk of development of invasive carcinoma 	comments
NONPROLIFERATIVE BREAST CHANGES (Fibrocystic changes)	do not have an increased risk.	Fibrocystic disease
PROLIFERATIVE DISEASE WITHOUT ATYPIA	1.5 to 2 times normal	a) Epithelial hyperplasia b) <u>Sclerosing adenosis</u> c) <u>Complex sclerosing lesions/radial scar</u> d) <u>Papillomas</u> e) Proliferative fibrocystic disease.
PROLIFERATIVE DISEASE WITH ATYPIA	4.0 to 5.0 times normal	a) ADH b) ALD
CARCINOMA IN SITU	8.0 to 10.0 times normal	a) DCIS b) LCIS

 very important information & an **area of questions.**

Summary from Robbins:

- Fibrocystic changes may be classified as nonproliferative (cystic) or proliferative.
- Proliferative lesions include epithelial proliferation of ducts and lobules (with or without features of atypia) and adenosis (proliferation of terminal ducts), sometimes associated with fibrosis (sclerosing adenosis).
- Atypical hyperplasia (whether ductal or lobular) is associated with a five-fold increase in the risk of developing carcinoma.

Questions

1/ A 30-year-old woman suffers traumatic injury to her breast while playing soccer. Physical examination reveals a 3-cm area of ecchymosis on the left breast. Two weeks later, the patient palpates a firm lump beneath the area where the bruise had been located. Which of the following is the most likely pathologic diagnosis?

- (A) Duct ectasia
- (B) Fat necrosis
- (C) Fibrocystic change
- (D) Granulomatous mastitis

2/ A 35-year-old nulliparous woman complains that her breasts are swollen and nodular upon palpation. A mammogram discloses foci of calcification in both breasts. A breast biopsy reveals cystic duct dilation and ductal epithelial hyperplasia without atypia. What is the appropriate diagnosis?

- (A) Ductal carcinoma in situ
- (B) Fibroadenoma
- (C) Fibrocystic change
- (D) Granulomatous mastitis

3/ A 24-year-old woman delivers a 3.5-kg baby and begins breastfeeding her infant. The patient presents 2 weeks later with a fever of 38°C. Physical examination shows no abnormal vaginal discharge or evidence of pelvic pain but does reveal redness on the lower side of the left breast. The patient stops nursing the infant temporarily, but the symptoms persist, and the entire breast becomes swollen and painful. What is the most likely diagnosis?

- (A) Acute mastitis
- (B) Chronic mastitis
- (C) Duct ectasia
- (D) Granulomatous mastitis

Answers:

- 1- B
- 2- C
- 3- A

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If there is any mistake or feedback please contact us on: 432PathologyTeam@gmail.com

