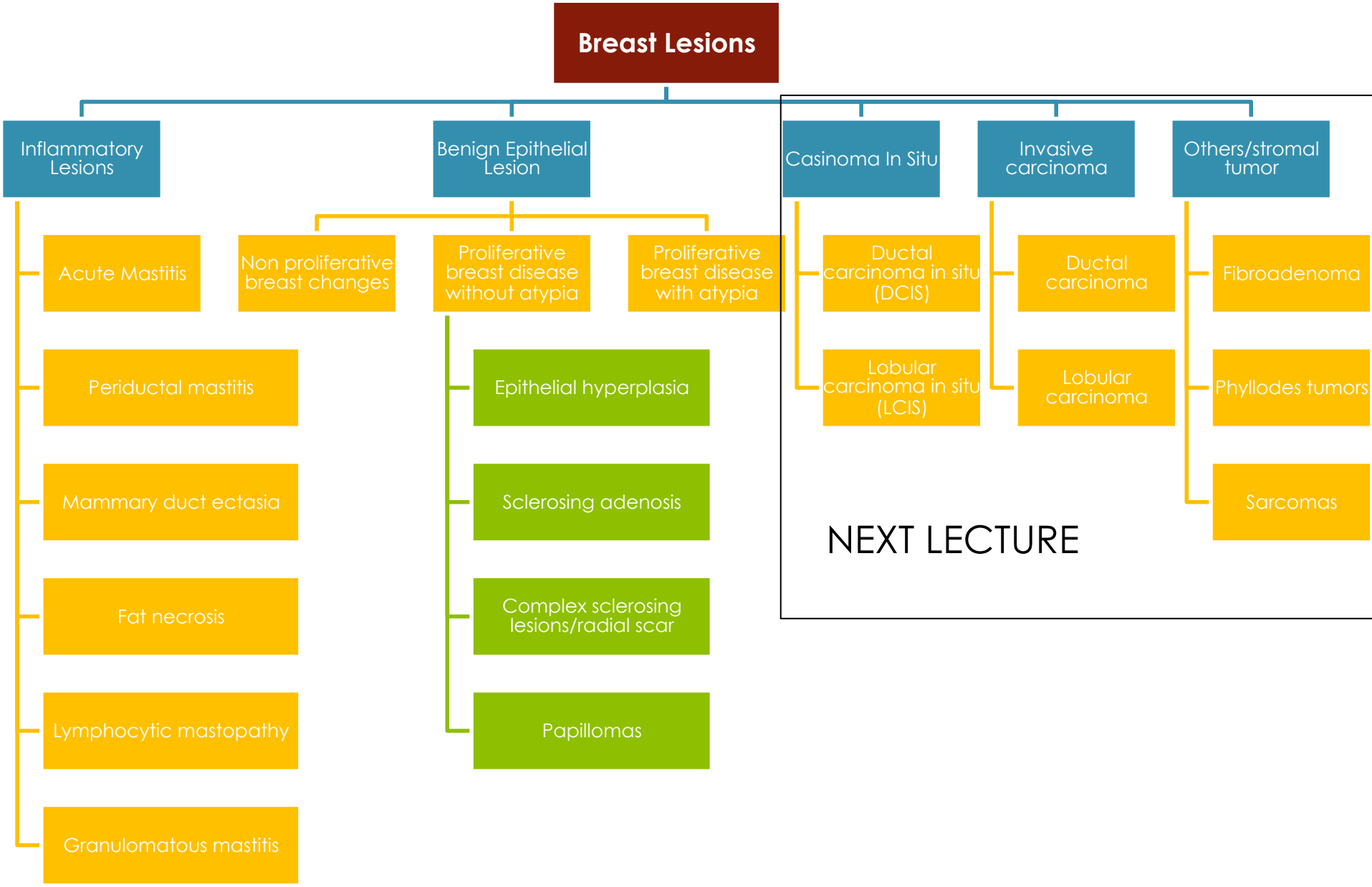
Lecture 8:
Pathology of Benign Breast Diseases

Important Notes Explanation

Objectives

The student should :

- Know the ways that benign breast conditions can clinically present.
- Know the common inflammatory conditions of breast (mastitis and abscesses).
- Understand the pathology of fibrocystic change.
- Know the risk of subsequent breast cancer in women with diagnosed benign breast tissue.


Breast Lesions
Inflammatory Lesions
Acute Mastitis
Periductal mastitis
Mammary duct ectasia
Fat necrosis
Lymphocytic mastopathy
Granulomatous mastitis
Benign Epithelial Lesion
Non proliferative breast changes
Proliferative breast disease without atypia
Epithelial hyperplasia
Sclerosing adenosis
Complex sclerosing lesions/radial scar
Papillomas
Proliferative breast disease with atypia
Casinoma In Situ
Ductal carcinoma in situ (DCIS)
Lobular carcinoma in situ (LCIS)
Invasive carcinoma
Ductal carcinoma
Lobular carcinoma
Others/stromal tumor
Fibroadenoma
Phyllodes tumors
Sarcomas
NEXT LECTURE

Clinical Presentation of Breast Diseases

1. Pain (mastalgia) :

- The most common breast symptom.
- May be cyclical with menses or noncyclical. (Associated cyclical hormone.)

Diffuse cyclical pain : has no pathologic significance.

Non-cyclical pain : can be caused by ruptured cysts or areas of prior injury or infection, or no specific cause.

- Although the great majority of painful masses are benign, about 10% of breast cancers present with pain.

2. Palpable mass : the **most serious** presentation.

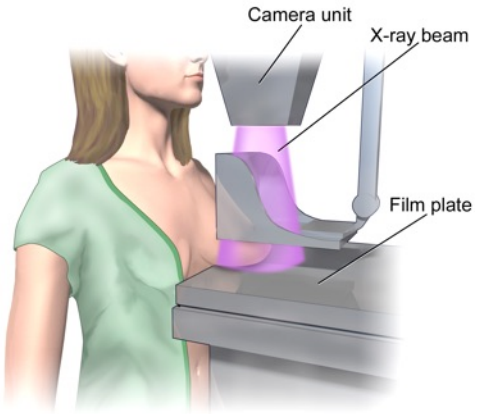
3. Nipple discharge :

- **Milky discharge:** not associated with malignancy.
- **Bloody or serous discharges:** commonly associated with benign lesions "nipple duct papilloma " but, rarely, can be due to a malignancy.

Prefix | mast- : Relating to a breast or nipple. (e.g. Mastitis, Mastalgia.. Etc.)

Mammographic Screening

- The value of mammography lies in its ability to identify small, non-palpable cancers.
- Mammographic screening is generally recommended to start at age 40. Younger women undergo mammography only if they are at high risk for developing carcinoma.



Mammogram

- **The principal mammographic findings of breast carcinoma are:**

1. **Densities (mass):**
   - Due invasive carcinomas, fibroadenomas, or cysts.
   - Most tumors appear radiologically denser than the normal breast.

3. **Calcifications:**

Calcium gets deposited on secretions, necrotic debris, or hyalinized stroma. Can be seen in benign and malignant conditions.

- Benign conditions are apocrine cysts, fibroadenomas, and sclerosing adenosis.
- Calcifications associated with malignancy are usually small, irregular, numerous, and clustered.
- Ductal carcinoma in situ (DCIS) is most commonly detected as mammographic calcifications. Mammographic screening has increased the diagnosis of DCIS .

Breast Lesions

Inflammatory lesions

1. **Acute mastitis:** staph infection is the most common
2. **Periductal mastitis**
3. **Mammary duct ectasia :**means dilated ducts disease, most of the time with dirty discharge.
4. **Fat necrosis:** is usually due to mechanical trauma, surgical or otherwise "present like cancer"
5. **Lymphocytic mastopathy (sclerosing lymphocytic lobulitis):** seen in diabetics
6. **Granulomatous mastitis :** sarcoid, TB, etc. but mostly idiopathic

Benign epithelial lesions

1. **Non proliferative breast changes (fibrocystic changes)**
2. **Proliferative breast disease without atypia**
3. **Proliferative breast disease with atypia / Atypical hyperplasia**

Carcinoma in situ

1. **Ductal carcinoma in situ (DCIS)**
2. **Lobular carcinoma in situ (LCIS)**

Invasive carcinoma

1. **Ductal carcinoma**
2. **Lobular carcinoma**

Others/stromal tumor

fibroadenoma, phyllodes tumors, sarcomas etc.

Mastitis

Acute mastitis

- Almost all cases of acute mastitis occur during the first month of breastfeeding.
- Staphylococcus aureus is the most common causative organism.
- The breast is erythematous and painful, and fever is often present.

Periductal mastitis

- This condition is 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.

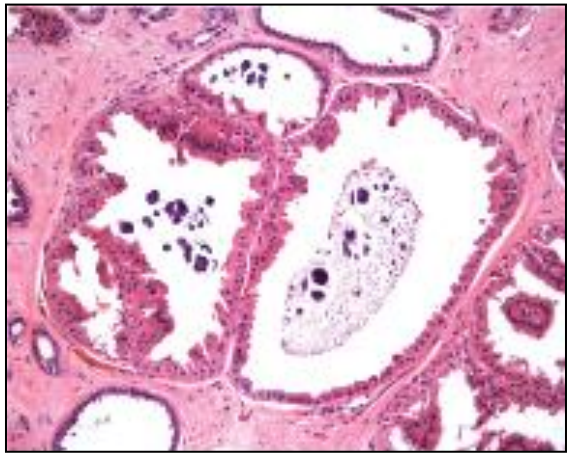
Benign Epithelial Lesions of Breast

1. Non proliferative Breast Changes (Older terminology: Fibrocystic Changes)

- It is the single most common disorder of the breast.
- "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. **" No increased risk for cancer "**
- The cause of fibrocystic change is not known.
- Thought to be caused by hormonal imbalances e.g. relative ↑ in estrogens or ↓ of progesterone, or abnormal end-organ metabolism of the hormones. "could be cyclical"
- Between 20-55yrs, decreases progressively after menopause.
- Could produce palpable breast mass, mammographic densities, calcifications ,or nipple discharge. It may also present with pain, which may be cyclical.

Three Morphologic Patterns seen in Fibrocystic 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. "see figure"
- **Fibrosis:** contribute to the palpable firmness of the breast.
- **Adenosis:** Increase in the number of acini per lobule. (Adenosis can be seen in pregnancy.)



2. Proliferative Disease without Atypia

- Rarely form palpable masses.
- Detected as mammographic densities.
- Incidental finding.
- Large duct papilloma present in 80% as nipple discharge.
- Risk for cancer is **1.5 – 2 times** normal.

The following entities are included in this category:

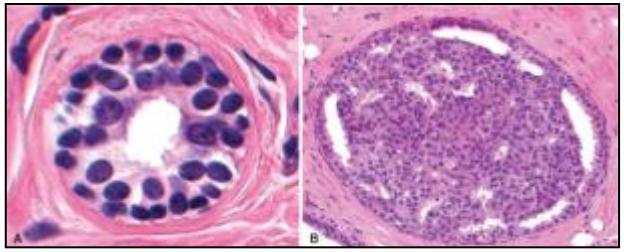
i. **Epithelial hyperplasia**
ii. **Sclerosing adenosis**
iii. **Complex sclerosing lesions/radial scar**
iv. **Papillomas**
v. **Proliferative variant of fibrocystic disease.**

A. Epithelial Hyperplasia (Usual Epithelial Hyperplasia)

- Epithelial hyperplasia is defined as the presence of more than 2 layers.
- Hyperplasia ranges from mild, moderate to florid.
- Both epithelial and myoepithelial cells proliferate.
- It 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 the of the proliferative type.
- **Note:** No atypical architectural or cytologic features are present.

Microscopically:

The lumen is filled with a heterogeneous population of cells of different morphologies, often including both luminal and myoepithelial cell types. Irregular slitlike fenestrations are prominent at the periphary.

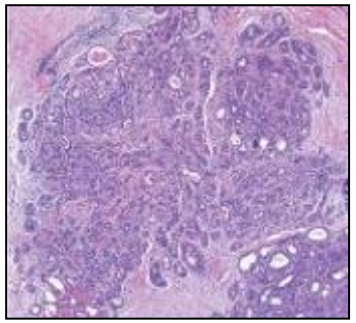


B. Sclerosing Adenosis

- Most often occurs as an incidental microscopic finding but may manifest as a palpable mass that may be mistaken clinically for cancer.
- Almost always associated with other forms of fibrocystic change.
- Diffuse microcalcifications are commonly seen in the lesion, which may **mimic carcinoma on mammography**.

Microscopically:

- characterized by increased in number of acini (adenosis) and ducts with stromal fibrosis within lobules which compresses and distorts the lobule.
- The involved terminal duct lobular unit is enlarged, and the acini are compressed and distorted by the surrounding dense stroma

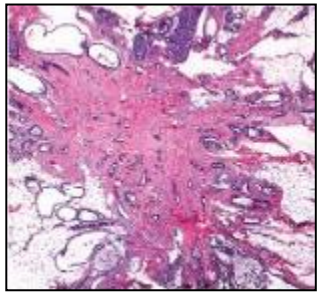


C. Complex Sclerosing Lesion (Radial Scar)

- Radial scars are stellate lesions characterized by a central nidus of entrapped glands in a hyalinized stroma.
- 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.

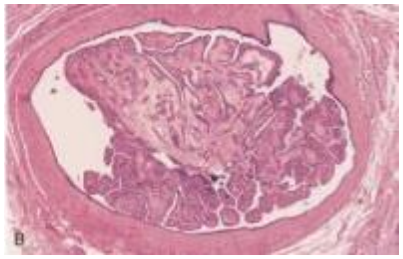
Microscopically:

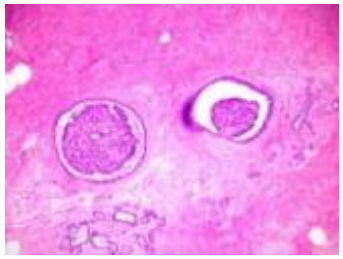
There is a central nidus consisting of small tubules entrapped in a densely fibrotic stroma surrounded by radiating arms of epithelium with varying degrees of cyst formation and hyperplasia.



D. Papillomas

- Papillary tumor that arises from the duct epithelium including large ducts.
- Arises more often in the central part of the breast from the lactiferous ducts (75%) but can occur in any quadrant.
- Commonly solitary, consisting of a single tumor in one duct, but multiple discrete tumors in branches of the ductal system may occur.
- **Large duct papillomas** are usually solitary and situated in the lactiferous sinuses of the nipple.
- **Small duct papillomas** are commonly multiple and located deeper within the ductal system.
- Small duct papillomas have been shown to increase the risk of subsequent carcinoma.
- Nipple discharge, which may be **bloody**, is the most common presentation for central papillomas and less commonly of peripheral tumors.
- A subareolar mass may be palpable.
- Age range is from **30 to 50** years.





3. Proliferative Breast Disease with Atypia (Atypical Hyperplasia)

- Risk for cancer is **4-5 times normal**
- Atypical hyperplasia is a cellular proliferation resembling 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 :**
  A. **Atypical ductal hyperplasia**
  B. **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.

Summary (from Robbin's basic pathology)

SUMMARY

Fibrocystic Changes

- Fibrocystic changes may be classified as nonproliferative (cystic) or proliferative.
- Proliferative lesions include epithelial proliferations 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.

Thank You!

We hope you found this helpful and informative.

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