The Breast

Reading: Large Robbins, breast diseases (chptr 23), Small Robbins, Chapter 18, pages 704 - 714
Wheater, breast chapter.

Online: Case 9, A young woman with a breast mass.

Anatomy

Normal breast anatomy

Modified skin appendage

Anatomic structure

Normal breast anatomy

Modified skin appendage

Anatomic structure:

Histology terminal duct lobular unit (TDLU)

Duct branch to the TDLU
Nipple: squamous epithelium

Ducts: columnar epithelium

Two cell types line the ducts and lobules.

1.

2.

Breast stroma - 2 cell types

1.

2.

Male breast (also see last page of handout)

Development of female breast:

Prepubertal

Menstrual cycle change
Pregnancy

After delivery (postpartum)

Senescence:

Development disorders

Milk Line Remnants

Accessory Axillary Breast Tissue

Congenital Nipple Inversion

Clinical Presentation of Breast Disease

Breast pain (mastodynia)

Palpable Mass

Nipple Discharge
Diagnostic modalities used to diagnose breast lesions

Radiologic Imaging

Mammographic Screening versus diagnostic

Ultrasound

MRI

Tissue diagnosis

Biopsy

Lumpectomy
**Inflammatory disorders**

Acute mastitis

Periductal mastitis

Mammary duct ectasia (plasma cell mastitis)

Fat necrosis

**Benign Stromal Lesions**

Intralobular

- Fibroadenoma
- Phylloides tumor

Interlobular

Benign: Pseudoangiomatous stromal hyperplasia (PASH)
Malignant: Angiosarcoma (See malignant section)

Benign Epithelial Lesions

Nonproliferative Breast changes (Fibrocystic changes)

Risk of breast cancer

Clinical

Radiology

Histology

Proliferative breast disease without Atypia

Risk of breast cancer

Clinical
Radiology

Histology

Components

Usual ductal hyperplasia

Sclerosing Adenosis

Papillomas

Proliferative breast disease with Atypia

Atypical ductal hyperplasia (ADH)

Atypical lobular hyperplasia
Carcinoma of the Breast

Diagnosis

Histologic

Prognostic

Genetic profiling

Risk factors

Sporadic carcinoma= hormonal

Estrogen drives cell proliferation increasing changes of DNA damage

Hereditary carcinoma= genetic mutations

BRCA1: Chromosome 17q21

52% of single gene hereditary cancers.

Only 2% of all breast cancers
Breast carcinomas usually basal-like (triple negative -ER/-PR/Her2 unamp).

Greater incidence in medullary carcinoma and poorly differentiated carcinomas

81% have both breast and ovarian carcinoma  (increased ovarian cancer risk)

BRCA2: Chromosome 13q12

32% of single gene hereditary breast cancers

Only 1% of all breast cancers

14% have both breast and ovarian carcinoma (increased ovarian cancer risk)

P53: Chromosome 17q13

Li-Fraumeni syndrome (sarcoma, leukemia, brain tumors, others)

Breast Carcinoma histologic types

Ductal carcinoma in-situ (DCIS)

Radiology
Histology

IHC (p63)

Treatment

Paget’s disease

Lobular carcinoma in-situ (LCIS)

Radiology

Histology

Therapy

Invasive carcinoma

Radiology

Histology

Therapy
Histologic subtypes (Table)

Invasive ductal = No special type NST

Grading

Prognostic markers

Her-2: info and assays

Prognostic factors

Gene expression profiling:

Luminal A

Luminal B

Normal breast-like

Basal-like
Invasive lobular carcinoma

Clinical

E-Cadherin

Metastasis pattern

Histology

Other histologic subtypes

Medullary, mucinous, metaplastic, tubular, papillary

Inflammatory carcinoma

Angisarcoma
Male breast

Gynecomastia

Carcinoma

Staging

Treatment

Sentinel node biopsy
Case 1.

HISTORY: This 39-year-old woman noted multiple nodules in both breasts that had increased in number and size during the previous 2 years. She had experienced menarche at 10 years of age and her first pregnancy at 36 years of age. Her mother and one sister had died of carcinoma of the breast.

PHYSICAL FINDINGS: Multiple small, rubbery, non-tender masses in both breasts, ranging in size from 0.5 - 1 cm. in diameter.

LABORATORY RESULTS:
- mammography: multiple ill-defined densities bilaterally

CLINICAL COURSE: A breast biopsy was performed.

The history, physical and mammographic findings are most suggestive of what condition? Which of the following features in the clinical history and physical findings carried the greatest risk that this patient might have breast carcinoma? If the breast biopsy had revealed fibrocystic change, what histological changes would have carried the greatest risk for later development of breast carcinoma?

If the biopsy had revealed lobular carcinoma, what would be a major concern and how would you go about confirming your suspicions?

Case 2.

This 31-yr-old schoolteacher noticed a solitary mass in the right breast 10 days before a biopsy was performed. She had been on oral contraceptive medication since the birth of her only child two years ago. The mass was asymptomatic, non-tender, not fixed to skin or underlying muscle. There was no nipple discharge or retraction. At operation a very firm, well defined tumor 2.5 cm in diameter was disclosed in the upper outer quadrant of the breast.

The most likely diagnosis in this case is what? What histological findings would you expect? Is there anything unusual in the history or physical findings of this patient?
Case 3.

This 45-yr-old woman had noted crusting of the right nipple for four months with induration beneath the areola. At operation a firm, irregular shaped and poorly defined mass 6 cm in largest diameter was found with fixation and retraction of the overlying nipple.

What is the most likely diagnosis in this case?
What you would you expect to be the histological appearance of the mass?