Presentation and Management of Breast Diseases
Dr. Abdulaziz Al-Saif

Anatomical consideration:

- The breast is a modified sweat gland.
- It extends from the second to sixth rib, from the side of sternum to the mid axillary line.
- It sits on the pectoralis major muscle (mainly, 60%), serratus anterior (30%) and the rectus sheath (10%).
- It is formed of 15-20 lobules separated by fibrous septa (*Cooper's ligaments*).
- It has the axillary tail of Spence.
- The arterial supply is through lateral thoracic and acromiothoracic branch of axillary artery, internal mammary artery, and intercostal arteries.
- The axillary, subclavian, and intercostal veins receive venous drainage.
- The primary route of lymphatic drainage is to the axilla (75-80%), with most of the rest to the internal mammary nodes.

NOTE:

- *Anatomical groups of lymph nodes are not applied in surgery.*
- *Lymph groups are:*
    a. *Anterior: deep to pectoralis major.*
    b. *Posterior: along subscapular vessels.*
    c. *Lateral: along the axillary vein.*
    d. *Central: in axillary pad of fat.*
    e. *Apical: drains the above, behind clavicle at apex of axilla.*
    - *Clinically, these groups are classified into three levels (in relation to pectoralis minor).*

Women come to see a breast surgeon because of one of the following:

- Breast lump (painful or painless) 60%
- Anxiety 20%
- Breast pain without lump 10%
- Nipple discharge 5%
- Change in breast contour 2%
- Nipple-areolar complex disorder 1%
- Axillary mass 1%
- Screen detected lesion 1%

Clinical approach:

- History.
- Clinical examination.
- Imaging.
- Cytology and tissue diagnosis.

History

- Full and complete history should be taken, and particular attention should be paid to:
  - Breast development stating from childhood to present time.
  - Endocrine status of the patient, mainly menstruation and OCP.
  - Size of the lump in relation to menses.
  - Pattern of pain in relation to menses.
  - Regularity of the cycle and quantity of blood.
  - Changes in breast during previous pregnancies and lactation periods, e.g. abscess, nipple discharge, retraction of nipple, milk retention.
  - Number of pregnancies, first birth under age of 20 is protective.
  - Breast feeding, protective if it is more than 6 months.
- Inquiry about family history of breast diseases, particularly in near relatives.
  - Nipple discharge.
  - Age at menarche.
  - Age of first birth.
  - Last menstruation.
  - History of cancer.
- For past menopausal women, inquire about:
  - Hormone replacement therapy (HRT).
  - Date of menopause.

NOTE:

- *If a family member got cancer at old age, it is less likely for a relative to have it (and vice versa).*

Examination

- Disrobed from waist and above.
- Examine in sitting, supine and 45^{o} positions.
- Inspection with arms by the side and above the head:
  - Size, symmetry, skin changes, nipple complex.
- Examine the *normal* side first.
- Examine the axilla, arm and SCF (supraclavicular fossa).
- Examine the abdomen.
- Examine the back.

Investigations

- Clinical examination.
- Cytology of discharge.
- Mammography and ductography.
- US (sonogram).
- Imaging guided percutaneous biopsy.
- MRI.
- Nuclear medicine (including PET).

Indications of imaging:

- Investigation of a palpable lump or nipple discharge.
- Screening in appropriate groups.
- Metastatic adenocarcinoma with unknown primary.

Mammography:

- Screening is done by two views; craniocaudal and mediolateral.
- Commonly detects microcalcification, and they are considered suspicious if pleomorphic, linear or branching, and increased in number in the next mammogram.
- Cardinal monographic features of malignancy:
  - Speculated mass.
  - Architectural distortion without mass.
  - Microcalcifications with casting or irregularity.
  - Circumscribed density with indistinct margins.
  - Asymmetric density.

Ultrasound (sonogram):

- Characterizes a mammographic abnormality.
- Characterizes a mammographically occult clinical abnormality.
- Initial examination in younger women (less than 30-35 years). ☝
- Imaging guided biopsies.
- Some utility in distinguishing benign from malignant lesions.
- It has no role in screening, even in the mammographically dense breast.
- Its role in monitoring neoadjuvant therapy is controversial.
- Advantages:
  - Painless.
  - Does not use ionizing radiation.
  - Very good at detecting cysts.
  - Can "see through" mammographically dense breasts.
- Disadvantages:
  - Not good for screening the breast.
  - Cannot always characterize lesions precisely.
  - More operator dependent than mammography.
- It looks for:
  - Location of the lesion.
  - Consistency (i.e. solid or cystic).
  - Margins.
  - Surrounding structures.

Cytology:

A. Fine needle aspiration cytology (FNAC):
   - Very sensitive (80-98%).

B. Core biopsy:
   - Tissue diagnosis.
   - Painful.
   - Costly.

C. Open (excisional or incisional) biopsy.

Calcification:

- 60% of localized biopsies are for calcification, but only 25% of them yield malignancy.
- Distribution (casting, linear, segmental, clustered).
- Morphology (pleomorphism).
- Relationship to parenchyma.

Rounded circumscribed masses; density with relation to parenchyma:

- Clarity of margins.
- Presence of calcifications.
- Size of stability (less than 2 cm).
- Number of lesions.

Benign Vs malignant imaging characteristics in the breast:

Benign	Malignant
Circumscribed mass, smoothly marginated	Speculated mass
Fat containing lesion	Architectural distortion with no history of prior surgery
Macrocalcifications	Microcalcifications
Round, uniform density, large, coarse	Linear, branching, pleomorphic, casting
Widely scattered	Tightly clustered
Long axis of the lesion is along the normal tissue planes	Lesion is taller than it is wide
Hyperechogenicity	Decreased hyperechogenicity
Homogeneous internal echotexture	Marked acoustical shadowing

Management of patient with a breast lump:

- History and physical examination.
- US.
- Mammogram if the patient's age is above 35 years.
- Biopsy:
  - FNAC (fine needle aspiration cytology).
  - Core biopsy.
  - Excision biopsy.
- Definitive treatment:
  - Observation.
  - Excision.
  - If malignant, along the lines of cancer cases.
- Generally, a patient with a breast lump is managed by the *triple assessment*; history and examination, mammogram (in 99%) and/or US, and cytology (FNAC). ☝

Benign Lesions of the Breast

- Have smooth margins.
- Have relatively uniform internal appearance.
- Don't disturb surrounding tissues.
- Are usually "wider than tall".

Nipple discharge:

- 95% are benign.
- Can be spontaneous or after applying pressure.
- The discharge may arise from single or multiple sites.
- The color of discharge varies, e.g. clear, milky, green, blue-black.
- It may be serous, serosanguineous or bloody.
- Rarely associated with invasive cancer.
- Causes:
  - Duct ectasia; the most common. ☝
  - Papilloma.
  - Cyst communicating with duct system.
  - Lactation.
- The source must be identified.
- Mammography and examination can be used to rule out malignancy.
- Consider ductography.
- Management:
  - Observation.
  - Single duct excision.
  - Total duct excision.

Breast cyst:

- The most common cause of breast mass in women in their fourth to fifth decades.
- Contains no or few echoes (i.e. hypoechoic).
- Have smooth margins.
- Often compressible.
- Has posterior enhancement.
- The size and tenderness fluctuate with the menstrual cycle.
- US is useful for detection.
- With aspiration:
  - Surgical biopsy if bloody.
  - Observation if it is non bloody and disappears completely, but if it doesn't resolve, we do surgical biopsy.

Fibroadenoma:

- Very common in young women (15-30).
- Composed of fibrous stromal tissue and tissue clefts lined with normal epithelium.
- It grows slowly and may become quite large.
- Firm, discrete rounded mass.
- Unlike the breast cyst, fibroadenoma is freely movable. ☝
- Hormonal stimulation during pregnancy increases its growth rapidly.
- Management is done based on the triple assessment:
  - If it is small (less than 2 cm), observe it.
  - If large, excise it.

Phylloides tumor (cystosarcoma): ☝

- A rare type of fibroadenoma.
- Although it is mostly benign, it can recur after excision (i.e. it is locally malignant).
- The malignant form of this lesion (about 10%) can metastasize hematogenously most commonly to the lungs and *not* to the axillary lymph nodes.

Breast Cancer

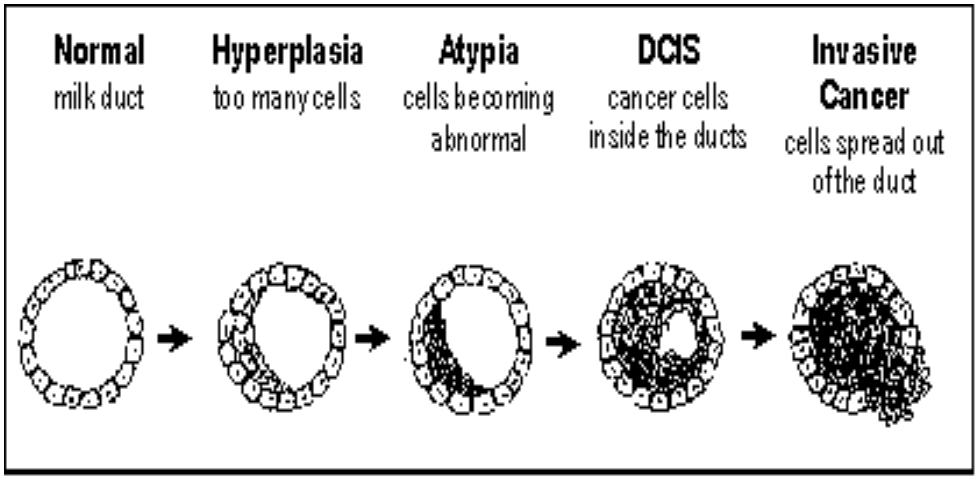
- The killer of women; affects 1:8 women in USA, and about 1:15 in KSA.
- 187000 cases of cancer breast in one year (USA).
- 45000 deaths per year (USA).
- The most common cause of death from cancer in western women.
- Every day in Australia, over 30 women discover they have breast cancer, and 11,400 people (11,314 women and 86 men) were diagnosed with it in 2000.
- *Nine out of 10 women who get breast cancer don't have a family history of the disease.*
- Age is the biggest risk factor; over 70% of cases occur in women over 50 years, but women aged 50-69 who have a breast screen every two years can reduce their chance of dying from it by at least 30%.
- *Breast cancer is the most common cancer in women aged over 35 years, 29% of all cancers diagnosed, and the average age of diagnosis of breast cancer in women is 45-55 years.*
- During the period 1994-1998, the five year survival rate for women diagnosed with breast cancer was 85%.
- Although we know of many factors that contribute to the risk of women getting breast cancer, the cause remains unknown.

Factor	**High-risk group**	**Low-risk group**
	Relative risk >4.0	**Relative risk ≤1.0**
Age	Old	Young
Country of birth	North America, Northern Europe	Asia, Africa
Mother *and* sister with history of breast cancer, especially if diagnosed at an early age	Yes	No
Biopsy-confirmed atypical hyperplasia and a history of breast cancer in a first degree relative	Yes	No
	Relative risk=2.1B4.0	**Relative risk ≤1.0**
Nodular densities on the mammogram	Densities occupying >75% of breast volume	Parenchyma composed entirely of fat
History of cancer in one breast	Yes	No
Mother or sister with history of breast cancer, diagnosed at an early age	Yes	No
Biopsy-confirmed atypical hyperplasia without a family history of breast cancer	Yes	No
Radiation to chest	Yes	No

Factor	High-risk group	Low-risk group
	Relative risk=1.1B2.0	**Relative risk ≤1.0**
Socio-economic status	High	Low
Place of residence	Urban	Rural
Race/ethnicity breast cancer at >45 years breast cancer at <45 years	 White Black	 Hispanic, Asian Hispanic, Asian
Religion	Jewish	Seventh-day Adventist, Mormon
Oophorectomy before age 40	No	Yes
Nulliparity, breast cancer at >40 years of age	Yes	No
Age at first full-term pregnancy	>30 years	<20 years
Age at menarche	<11 years	>15 years
Age at menopause	>55 years	<45 years
History of primary cancer in endometrium, ovary	Yes	No
Obesity breast cancer at >50 years breast cancer at <50 years	 Obese Thin	 Thin Obese

Characteristics of malignant lesions:

- Irregular or indistinct margins.
- Heterogenous internal appearance.
- Often cut across surrounding tissue planes.
- Are often "taller than wide" or rounded (special types).



Ductal carcinoma in-situ (DCIS):

- Doesn't spread to the axillary lymph nodes, so these are usually not removed.
- The treatment is according to the degree:
  - Total mastectomy.
  - Lumpectomy.
  - Lumpectomy and radiation therapy.

Histopathological types of breast cancer:

1. **Infiltrating (or invasive) ductal carcinoma (IDC):**
   - 80% of all breast cancers.
   - Starting in a milk passage, or duct, of the breast.
   - It breaks through the wall of the duct and invades the breast's fatty tissue.
   - Can spread to other parts of the body through the lymphatic system and through the bloodstream.

2. **Infiltrating (or invasive) lobular carcinoma (ILC):**
   - 10-15% of breast cancers.
   - Starts in the milk producing glands.

3. **Medullary carcinoma:**
   - 5% of all breast cancers.
   - Has a relatively well defined distinct boundary between tumor tissue and normal breast tissue.
   - The prognosis is better than that for invasive lobular or invasive ductal cancer.

4. **Colloid carcinoma:**
   - Rare, also called mucinous carcinoma.
   - Formed by mucus producing cancer cells.
   - Prognosis is better than for invasive lobular or invasive ductal cancer.

5. **Tubular carcinoma:**
   - 2% of all breast cancers.
   - Special type of invasive breast carcinoma. Prognosis is better than invasive ductal or lobular carcinoma.
   - Detected by breast screening.

6. **Adenoid cystic carcinoma:**
   - Rarely develops in the breast; it is more usually found in the salivary glands.
   - Prognosis is better than invasive lobular or ductal carcinoma.

Treatment:

- Surgery; either:
  - WLE (wide local excision).
  - Mastectomy.
- Radiotherapy.
- Chemotherapy.
- Hormonal therapy.
- Ovarian ablation.
- Reconstruction.

Prognostic factors:

- Size.
- Grade.
- Lymph nodes.

For extra reading
Lawrence's Essential of General Surgery
Chapter 20 385-397

Churchill's Pocketbook of Surgery
Chapter 10 195-208

The Future Surgeons

Contact us at:
surgeons-424@hotmail.com