BREAST

Fundamentals of Surgery Course
Objectives

- Risks for breast cancer
- Routine screening mammography
- Describe the diagnostic workup and management for breast conditions.
- Describe workup for breast mass or nipple discharge.
- Describe the preop evaluation with breast cancer.
Objectives

- Know differential diagnosis of a breast lump.
- Explain breast conservation treatment
- Describe adjuvant therapy, radiation therapy, and hormonal therapy.
- Describe the expected survival and local recurrence rates.
Breast

- 211,300 women and 1300 men diagnosed 2003 with breast cancer.
- 58,000 cases of in-situ breast cancer.
- 40,000 women die each year.
- One in eight women develop breast cancer.
- 10% are related to genetic factors.
- 1% occur in men
Anatomy

- Glandular, ductal, connective and adipose tissue
- Location superficial to pectoralis major muscle.
- Extends from clavicle superiorly to sixth rib inferiorly.
- Midsternal line medially into the axilla laterally.
Anatomy

15 to 20 lobes that radiate from the nipple area.
Blood supply Arteries

- Perforating branches of paired internal mammary arteries.
- Lateral thoracic artery
Blood supply veins

- Axillary
- Subclavian
- Intercostal veins
Nerves

- Long thoracic- surface of serratus anterior muscle and motor innervation to serratus anterior muscle.
- Abducts and laterally rotates the scapula and holds against the chest wall.
Nerves

- Thoracodorsal nerve is located posteriorly in axillary space
- Innervates the latissimus dorsi muscle
- Adducts, extends and medially rotates the arm.
Nerves

- Medial pectoral nerve pierces pectoralis minor en route to pectoralis major innervates both.
Nerves

- Intercostobrachial nerves are lateral cutaneous branches of the first and second intercostal nerves.
- Innervation to inner aspect of upper arm and axilla
Anatomy

- Primary drainage (75%) is to axilla.
- Internal mammary nodes.
- Level I- lateral to pectoral minor
- Level II- central
- Level III- medial
Physiology

- Modified apocrine gland
- Estrogen stimulates proliferation of the breast ductal system.
- Postmenopausal - breast tissue is replaced with adipose tissue.
Gynecomastia

- Enlarged tender breasts in males.
- Physiologic/pubertal gynecomastia occurs in over 50% adolescent males.
- Physiologic/senescent gynecomastia in elderly.
- Bilateral or unilateral
- Digoxin, estrogens, thiazides and theophylline
Diagnosis

- Complete history
- Physical
- Diagnostic studies
History

- Current problems
- History of biopsies
- Mammography
- Family history cancer.
- Age at onset menses and natural or surgical menopause.
History

- Age at first full-term pregnancy, number pregnancies
- Use of birth control pills, hormone replacement therapy
- Current medications
Risk Factors

- Female sex
- Increasing age
- Family history- BRCA-1 and BRCA-2
- Proliferative pathology with atypia on biopsy.
Physical

- Inspection and palpation

- Sitting arm at side, elevated, on waist.

- Inspect nipples

- Palpate breast and axillae.

- Palpate from sternum to the axilla and from the clavicle to below the inframammary crease.
Physical

- Strip method, “spokes of a wheel” or a spiral pattern.
- Mass size
- Tender or nontender
- Mobile or nonmobile
- Texture
- Nipple discharge: color, spontaneous, bloody, or bilateral.
Diagnostic Evaluation

- Monthly self breast examination
- Yearly mammography for women aged 40 and older
- Yearly breast physical examination by a health care professional.
- Ultrasound
- MRI- BRCA early detection, sensitivity of >90% for invasive cancer.
Mammography

- 10% false-negative rate
- Suspicious mass: irregular or spiculated margins
- Microcalcifications: pleomorphic, linear, or branching
Ultrasound

- Noninvasive
- Characterize palpable lesions or suspicious areas on mammography.
- Solid vs cystic
- Simple vs complex
Ultrasound

- **Benign:** sharp borders, central enhancement, absence of internal echoes.

- **Suspicious:** poorly defined margins, heterogeneous internal echoes, taller than wide”, irregular internal shadowing.
MRI

- High risk patients.
- Dense breast, breast implants, scars
- BRCA: early detection
- Invasive lobular carcinoma.
- Sensitivity >90% for invasive cancer, <60% for DCIS.
Tissue-sampling techniques

- Cytology - individual cells
- Histology - individual cells and their relationship to each other.
Biopsy

- FNA-fine needle aspiration, cells are aspirated and smeared on a slide.
- Core-needle: small thin cores of tissue.
- Open: excisional biopsy, needle localized excisional biopsy.
Fibroadenoma

- Benign tumor
- Young women
- Freely movable, discrete, firm, rounded mass.
- FNA or core biopsy
Cyst

MCC mass in women 4\textsuperscript{th} and 5\textsuperscript{th} decade.

Fluctuates with the menstrual cycle

Ultrasound

Aspiration on large or symptomatic cysts.

Complex – mammogram and core biopsy.
Nipple Discharge

- MCC- duct ectasia
- Color- clear, milky, or green-brown.
- 10% to 15% unilateral bloody discharge is malignant.
- Intraductal papilloma
Abscess and Mastitis

- Chronic inflammation and fistula in nonlactating women.
- Abx and drainage.
- Mastitis – pain and erythema in lactating women.
- Staphylococci or streptococci
- Tx: dicloxacillin or clindamycin
Noninvasive Epithelial Cancers

- Lobular carcinoma insitu (LCIS)
- Ductal carcinoma in situ (DCIS) or intraductal carcinoma- papillary, cribriform, solid and comedo type.
Invasive Epithelial Cancers

- Invasive lobular carcinoma
- Invasive ductal carcinoma: IDC, tubular, mucinous or colloid, medullary, invasive cribriform, invasive papillary, adenoid cystic and metaplastic carcinoma.
Mixed Connective and Epithelial

- Phyllodes tumor
- Carcinosarcoma
- angiosarcoma
LCIS

- Marker for IDC or ILC
- Bilateral
- Incidentally identified with excision.
DCIS

- Preinvasive form of ductal carcinoma.
- Mammogram- microcalcifications.
- Types- solid, cribriform, micropapillary, and comedo-type.
- Higher- grade: solid and comedo types.
ILC

- 10% of breast cancers
- Multicentricity-contralateral breast
- Difficult to detect on mammogram and physical exam.
IDC

- 70% of breast cancers
- Firm irregular mass
- Mammogram- well defined
Paget’s Disease of nipple

- <1% of breast cancers
- Nipple erythema and irritation.
- Itching, burning, or sticking pain in the nipple.
- Tx: mastectomy with axillary staging or wide excision of the nipple and areola, axillary staging, and radiation.
Inflammatory Carcinoma

- 3% of breast cancers.
- Erythema and edema (Peau d’orange)
- Tx: aggressive neoadjuvant chemotherapy, mastectomy, and radiation therapy, with hormonal therapy in estrogen-responsive tumors.
- Poor prognosis- 25% alive at 5 years.
Staging

- **Tis** – insitu
- **T1** - <2cm
- **T2** - >2cm, <5cm
- **T3** - >5cm
- **T4** – any size with extension to chest wall or skin.

- **N0** – no lymph node mets
- **N1** – 1 to 3 ALN
- **N2** – 4 to 9 ALN
- **N3** - > 10 ALN
Staging

- M0 – no distant metastasis
- M1 – distant metastasis
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* not available
Surgical treatment

- Lumpectomy, wide local excision or partial mastectomy - excision of a malignancy with 2 to 3 mm clear margins, sentinel lymph node biopsy
- Preservation of the breast - breast conserving surgery
Surgical Treatment

- Simple or total mastectomy - complete removal of the mammary gland including nipple and areola.
- Modified radical mastectomy - complete removal of the mammary gland including nipple and areola with axillary dissection.
Nodal biopsy

- Axillary dissection - level I and II for presence of lymph node metastasis.
- Sentinel LNB – clinically negative axilla
Eligibility for Breast Conservation

- Tumor size: < 5 cm with clear margins and cosmetic result.
- Margins- 2 to 3 mm clear margins.
- Radiation therapy
Prophylactic Mastectomy

- Bilateral simple mastectomy
- High-risk lesions
- Atypical ductal hyperplasia, LCIS
- Strong family history
- BRCA-1 or BRCA-2
- Reduces risk of breast cancer by 90%
Chemotherapy

- MC cyclophosphamide, doxorubicin, and 5-fluorouracil
- Doxorubicin, cyclophosphamide, and taxane
- Indications: premenopausal and postmenopausal patients with node positive disease and tumors >1cm.
Hormonal Therapy

- Tamoxifen- estrogen-receptor-positive (ER+) tumors
- Decreases incidence of contralateral breast cancer by 40%
- 5 years
Treatment for Recurrent and Metastatic Breast Cancer

- Local recurrence after breast conserving surgery- mastectomy/radiation
- Local recurrence after mastectomy-local excision and radiation
- Metastatic disease- chemotherapy
- Brain metastases- radiation
Complications

- Infection, bleeding, and seroma
- Flap necrosis
- Lymphedema and decreased ROM arm.
- Winged scapula
- Loss of sensation to the skin of the inner upper arm.
Complications

- Chemotherapy: N/V, leukopenia, thrombocytopenia, and alopecia.
- Doxorubicin: cardiotoxicity
- Sepsis and hemorrhagic cystitis.
- Tamoxifen: hot flashes, fluid retention, vaginitis, and thrombocytopenia.
Complications

Radiation- breast edema progress to fibrosis and hyperpigmentation.
**Prognosis**

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<th>Stage</th>
<th>Survival rate (%)</th>
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<td>I</td>
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<td>IV</td>
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Axillary lymph node status—disease-free and overall survival.
Follow Up

- Physical exam - 3 to 6 months x 3 years then yearly
- Bilateral mammogram 6 months after radiation therapy following lumpectomy.
- Mammogram yearly after mastectomy