Surgical Management of Breast Cancer

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Case Presentation

- 36 y/o female presented with palpable Rt breast mass.

- PMH
  - 2003- Lt breast infiltrating ductal carcinoma (T2 N1 M0), ER/PR neg, HER2/neu+1, BRCA neg
    - Neoadjuvant chemotx, lumpectomy and axillary dissection, RT and adjuvant chemotx.
  - Premenopausal, G2P2, menarche age 13, first birth at age 19, +breastfeeding, no OCP/HRT use.

- Fam Hx- Mother and sister had breast cancer.
Case Presentation

- PE- Rt breast- 2cm mass at 9 o’clock.
  - Lt breast unremarkable. No lymphadenopathy.
- Labs WNL
- Breast U/S- Rt breast 1.6cm mass at 9 o’clock and smaller mass at 11 o’clock
- Core needle bx- infiltrating ductal carcinoma, ER/PR neg
- CT scan of chest, abdomen and pelvis- negative
- Bone scan- negative
Lumpectomy and Sentinel LN bx was offered.

Pt requested bilateral mastectomies.

- Lt simple mastectomy
- Rt modified radical mastectomy
- Bilateral placement of tissue expanders for delayed reconstruction.
Modified Radical Mastectomy

- Supine position, ipsilateral arm abducted at 90°
- Transverse elliptical incision from lateral edge of sternum to the midaxillary line.
- Skin flaps limits-
  - Upper- Clavicle
  - Lower- Inframammary fold
  - Medial- Lateral border of sternum
  - Lateral- Latissimus dorsi muscle
- Breast tissue dissected off the underlying pectoralis major muscle
- Axillary LN dissection.
Axillary dissection

[Diagram showing anatomical structures including Axillary Vein, Subscapular Vein, Long Thoracic Nerve, Intercostal Brachial Nerve, Thoraco-Dorsal Nerve, and other relevant structures.]
Axillary dissection

- Deltoidpectoral glands
- Lateral group
- Subclavicular group
- Mammary lymphatic ending in subclavicular glands
- Pectoral group
- Mammary collecting trunks
- Subareolar plexus
- Cutaneous collecting trunk from the thoracic wall
- Cutaneous collecting trunks
- Collecting trunks passing to internal mammary glands
Case Presentation

- Pt was discharged home on POD #1 with JP drains.
- Path
  - Rt breast masses- infiltrating ductal carcinoma, high grade, negative margins
  - Rt Axillary LN- negative
  - Lt breast- no tumor
  - T3 N0 M0
- Pt started on adjuvant chemotx, to be followed by RT.
- Tissue expansion uneventful.
Surgical Management of Breast Cancer
Breast Cancer

- Breast cancer
  - Most common cancers in women: breast, lung, and colon cancer.
  - MCC of cancer death among women age 20 to 59 (Jemal et al).

Breast Cancer past and present.

  - 2/3 patients had locally advanced disease.
  - 60% patients with axillary lymphadenopathy.
  - Radical mastectomy prevailed for next 75 years.

- 1970s – average tumor size at presentation – 2 cm
- 1980 - ACS - 85% patients presented with stage I or II disease.
  - 40% patients with axillary lymphadenopathy.
Definitions

- **Radical Mastectomy**
  - Removal of breast tissue, pectoralis major and minor muscles, level I, II and III axillary LN

- **Modified Radical Mastectomy**
  - Removal of breast tissue, level I and II axillary LN

- **Simple Mastectomy**
  - Removal of breast tissue

- **Subcutaneous or Skin-sparing Mastectomy**
  - Removal of nipple-areolar complex.
TNM Classification for Breast Cancer Staging

- **Primary Tumor**
  - Tx- primary tumor cannot be assessed
  - T0- no evidence of primary tumor
  - Tis- carcinoma *in situ*
  - T1- tumor $\leq 2$ cm
  - T2- tumor 2 – 5 cm
  - T3- tumor $> 5$ cm
  - T4- any size extending to chest wall, inflammatory carcinoma
TNM Classification for Breast Cancer Staging

- **Regional Lymph Nodes**
  - **Nx**- Nodes cannot be assessed
  - **N0**- No node metastasis
  - **N1**- Mets 1-3 axillary nodes
    - Internal mammary (IM) nodes (+path, not clinically apparent)
  - **N2**- Mets 4-9 axillary nodes
    - Clinically apparent IM nodes
  - **N3**- Mets $\geq 10$ axillary nodes
    - Mets IM and axillary nodes
    - Mets Supraclavicular or infraclavicular nodes
TNM Classification for Breast Cancer Staging

- Distant Metastases
  - Mx: Mets cannot be assessed
  - M0: No distant metastasis
  - M1: Distant metastasis
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Stage 0 – Tis
Lobular Carcinoma In Situ (LCIS)

- Incidental finding in breast biopsies.
- Breast cancer risk factor and not a malignancy that progresses locally.
  - Risk of breast cancer development of 1 % per year.
  - Risk affects both breast.
  - Pt may develop infiltrating lobular or ductal ca.
  - Average time for cancer to develop is 10-15 yrs.

Tx
- Close follow up - annual mammogram
- Chemoprevention
  - Tamoxifen- 65% risk reduction (Fisher et al).
- Prophylactic bilateral mastectomy
  - Simple or subcutaneous mastectomy.
  - 90% risk reduction (Hartmann et al).
Stage 0 – Tis

Ductal Carcinoma *In Situ* (DCIS)

- **Presentation**: clustered microcalcifications on mammogram
- **Management**
  - Simple Mastectomy +/- Sentinel LN bx
  - Excision and Radiation Therapy (RT)
  - Excision alone
Stage 0 – Tis Ductal Carcinoma *In Situ* (DCIS)

- **Simple Mastectomy**
  - **Indications**
    - Multicentric disease identified on mammogram
    - Positive margins after reexcision
    - Unacceptable *cosmesis* to obtain negative margins
    - Patient’s choice.
  - Cures 98% patients
  - Tx failure related to unrecognized invasive carcinoma.
    - Invasive carcinoma found in 26% of pts having mastectomy for DCIS (Morrow, et al)
  - Radical tx for a lesion that may not progress to invasive carcinoma.
Stage 0 – Tis
Ductal Carcinoma *In Situ* (DCIS)

- **Excision and Radiation Therapy (RT) vs Excision alone**
  - **Prospective randomized trials**
    - National Surgical Adjuvant Breast Project (NSABP) B17
    - European Organization for Research and Treatment of Cancer (EORTC)
    - United Kingdom Trial

- **RT reduced ipsilateral breast tumor recurrence by 50-60%**.
  - Recurrence with excision 32% vs 16% in excision and RT at 10yrs
  - 50% of recurrences were invasive ca in both groups.
  - No survival benefit from RT.
Stage I and Stage II Breast Cancer

- Goal of surgical tx
  - Remove all clinically evident tumor in the breast and axillary lymph nodes.
  - Modified Radical Mastectomy (MRM)
  - Breast-conserving Therapy (BCT)
    - Excision of primary tumor with negative margins
    - Sentinel LN bx
    - RT
Stage I and Stage II Breast Cancer

- Breast-conserving Therapy (BCT)
  1. Reduce the tumor burden to a microscopic level likely to be controlled by irradiation.
  2. Safely to deliver radiation therapy.
  3. Promptly detect local recurrences.
Stage I and Stage II Breast Cancer

- **Absolute contraindications to BCT**
  - Two or more primary tumors in different breast quadrants.
  - Persistent positive margins after excision.
  - Diffuse malignant-appearing microcalcifications.
  - Pregnancy is a contraindication to RT.
    - Third trimester- tumor excision, then RT after delivery.
  - Hx prior RT to breast.

- **Relative contraindications to BCT**
  - Multifocal or extensive disease in same breast quadrant.
  - Unacceptable cosmesis (large tumor in small breast).
  - Hx scleroderma and active SLE.
## BCT vs MRM
### Prospective Randomized Trials

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Axillary Nodes

- **Staging procedures**
- **Sentinel lymph node biopsy**
  - Sentinel LN- 1st LN that receives drainage from the cancer.
  - Uses lymphazurin blue dye, colloids labeled with radioactive isotope (technetium), or both.
  - Less morbid than axillary LD dissection.
  - 10% false-negative (Krag, et al).
- **Contraindications**
  - Clinically positive axillary LN
  - Locally advanced breast cancer
  - Patient is pregnant or lactating
  - Prior axillary surgery.
Axillary Nodes

- **Axillary dissection**
  - **Indications**
    - Pts with positive Sentinel LN bx
    - Pts with contraindications to Sentinel LN bx

- **Removal of level I and level II LN identifies metastasis in 98% of cases.**

- **Complications**
  - **Lymphedema**
    - Incidence 6 - 30%, radiation to axilla increases risk.
  - **Intercostobrachial nerve injury - numbness**
  - **Long Thoracic nerve injury - Winged scapula deformity.**
Stage III and Stage IV Breast Cancer – Locally Advanced Breast Cancer

- Initial surgical treatment
  - ↑ rate of recurrence, poor 5-yr survival, tx failure within 2 yrs of dx.

- Induction chemotherapy to reduce tumor burden.

  Mastectomy or Lumpectomy

  Chemotherapy, RT and Hormonal Tx
Thank You!