Updates in Surgical Treatment of Breast Cancer

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Disclosures
None

Learning Objectives
• To discuss the multidisciplinary approach to breast cancer management
• To review modern treatment strategies for breast cancer including locoregional and systemic therapies
What is Breast Cancer?

Breast Cancer Facts

- Second Leading cause of death in women
- 240,000 women diagnosed with breast cancer annually
- Incidence of invasive breast cancer has been increasing since 1940.
  - 60 cases per 100,000 women in 1940
  - 90 cases per 100,000 women in 1980
  - 123 cases per 100,000 women in 2009

Breast Cancer Facts

- From 1940-1990, the death rate from breast cancer stayed fairly constant
  - 33 deaths per 100,000
- After 1990, the death rate from breast cancer has steadily declined
  - In 2005, 21.5 deaths per 100,000
Breast Cancer Facts

- Declining death rate causes
  - Institution of widespread mammographic screening in the 1980s
  - Improved treatment of breast cancer

Multidisciplinary Treatment Paradigm

Locoregional Disease Control
- Eliminates cancer cells in the breast and axilla
  - Surgery
  - Radiation

Systemic Disease Control
- Eliminates cancer cells in the whole body
  - Chemotherapy
  - Targeted Therapy

Locoregional Control

- Eliminate cancer cells in the breast and regional lymph nodes
  - Surgery
  - Radiation
Surgery

Lumpectomy  Mastectomy

Breast Cancer Overall Survival

Overall survival is the SAME for mastectomy and lumpectomy

Modern Lumpectomy Techniques

• Oncoplastic lumpectomy
Modern Mastectomy Techniques

- Skin-sparing
- Nipple-sparing

Skin-Sparing Mastectomy

- Removal of breast and nipple-areolar complex
- Preservation of skin for immediate reconstruction
Nipple-Sparing Mastectomy

- Removal of breast tissue
- Preservation of entire skin envelope
Breast Reconstruction

**Immediate**
- Reconstruction is started in the same operation as mastectomy

**Delayed**
- Reconstruction is done as a separate operation after mastectomy
Breast Reconstruction

- Implant
- Autologous tissue

Sentinel Lymph Node Biopsy

- Performed for invasive cancers to determine stage
Sentinel lymph nodes

Treatment Paradigm

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Radiation Therapy

- Radiation
  - Primary goal
    - Destroy any cancer cells remaining after surgery to improve locoregional control
    - Small to no impact on survival

Candidates for Radiation

- Nearly all lumpectomy patients
- Mastectomy patients who have involved lymph nodes

Radiation Delivery

- Whole Breast Irradiation
  - Lumpectomy and mastectomy
- Accelerated Partial Breast Irradiation
  - Lumpectomy only
- Intraoperative Radiation
  - Lumpectomy only

Whole Breast Irradiation

- Delivered by external beam radiation using linear accelerator
- 3-6 weeks of daily treatment
  - 5 days/week
Accelerated Partial Breast Irradiation (APBI)

- Treatment limited to affected quadrant
- Shorter duration of therapy
  - 5 days of twice daily radiation
- Varying delivery methods
- Limited long-term data
- ONLY used for patients with low-risk of recurrence

Intraoperative Radiation Therapy (IORT)

- Treatment limited to tumor bed
  - Smaller field than APBI
- Single intraoperative dose
  - Before margins can be assessed
- No long-term data
- ONLY used for patients with low-risk of recurrence
Intraoperative Radiation

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Treatment Paradigm

A Popular Request

- "I want a mastectomy so I don’t have to have chemo."
  - women with breast cancer
Clinical Breast Cancer Subtypes

- After diagnosis, all invasive breast cancers are tested for:
  - Estrogen Receptor (ER)
  - Progesterone Receptor (PR)
  - Human epidermal growth factor receptor 2 (HER2)

- ER+ 65-80%
- HER2+ 25%
- Triple-negative 15-20%

Risk Factors for Systemic Recurrence

- Number of positive lymph nodes
- Size of tumor
- ER/PR negative
- HER2+ (improved with anti-HER2 therapy)
- Lymphovascular invasion
- Tumor Grade

Risk of Systemic Relapse at 10 years (no adjuvant therapy)

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<th>T1N0</th>
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<td>T2N0</td>
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<tr>
<td>T1N+ (1 node)</td>
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<td>T1N+ (2-3 LN)</td>
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<tr>
<td>T1N+ (4-9 LN)</td>
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<tr>
<td>T1N+ (10+ LN)</td>
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<td>T2N+ (1 node)</td>
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<tr>
<td>T2N+ (10+ LN)</td>
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- The higher the stage, the higher the risk of systemic recurrence
Systemic Therapy

- Type of therapy determined by breast cancer subtype and risk of recurrence
  - Endocrine Therapy
  - Anti-Her2 directed therapy
  - Chemotherapy

Endocrine Therapy

- Synonyms
  - Hormone therapy
- Mechanism of Action
  - Block estrogen and/or progesterone from reaching target cells
  - Lower estrogen and progesterone levels
- Used for all breast cancers that have the Estrogen Receptor and/or Progesterone Receptor
  - tamoxifen
  - exemestane, letrozole, anastrozole
- Daily pill for 5 or more years
Anti-Her2 Therapy

- Her2 positive breast cancers
  - 25% of all cancers
  - Aggressive
- trastuzumab (Herceptin) and pertuzumab (PERJETA®)

Trastuzumab

- Given along with chemotherapy
  - Followed by 1 year of monotherapy

Chemotherapy Basics

- Chemotherapy for breast cancer improves disease free and overall survival
- Regimens contain multiple agents and treatment lasts 3-9 months
- Benefits of chemotherapy are independent of benefits of endocrine therapy
- All adjuvant therapy regimens cause hair loss
Tumor Profiling

- Predict which patients will benefit most from chemotherapy
  - Eliminate chemotherapy for those who will have minimal benefit

- Oncotype Dx Recurrence Score
  - Only for early stage patients with ER positive tumors
    - node negative

Oncotype DX recurrence score

- 16 Cancer and 5 Reference Genes
- Done on tissue removed during surgery

- Determines the risk of distant recurrence at 10 years after 5 years of endocrine therapy
- Classifies tumors by the expected degree of benefit from the addition of chemotherapy
Chemotherapy without Hair Loss

- DigniCap® scalp cooling system

Putting it Together

- Breast cancer treatment must consistent of a multidisciplinary approach, where a combination of therapies are used to destroy cancer cells in the breast, regional lymph nodes, and the entire body

Thank you!