

SURGICAL TREATMENT OPTIONS FOR BREAST CANCER: WHICH WAY IS THE PENDULUM SWINGING NOW?

Sun Yong Lee, MD, FACS
Assistant Director
Jefferson Breast Care Center
Philadelphia, PA



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ADVANCES IN BREAST CANCER

- Treatment of breast cancer is a team effort
- Multidisciplinary approach to treat breast cancer
- Local therapy
 - Surgical therapy
 - Radiation therapy
- Systemic therapy
 - Chemotherapy
 - Herceptin therapy
 - Hormonal therapy



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ADVANCES IN BREAST CANCER

- Surgery is only one arm of multi-pronged approach to treating breast cancer
- Surgical advances are possible because of advances in other modalities
- Advances in both diagnostic and therapeutic management
- Separation of diagnostic techniques from therapeutic maneuvers



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ADVANCES IN BREAST CANCER

- Before, same surgical procedures done for diagnosis and therapy
- Because of these different procedures for diagnosis versus actual treatment, our recommendations can swing from minimally invasive procedures to extensive surgery
- Our attitudes towards certain procedures are changing as well
- New data emerging to indicate that in some instances “less is good”
- Other data emerging to indicate that “less is not always good”



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SURGICAL ADVANCES-DIAGNOSTIC

- Now, a separate diagnostic procedure almost always precedes therapeutic measures—not necessarily need surgery to get a diagnosis
- Less invasive techniques of biopsy
 - Core needle biopsy
 - Fine needle aspiration
- Different imaging modality used to visualize lesions for core biopsy—core biopsy needle is essentially the same
 - Mammographically directed stereotactic core needle biopsy for calcifications, etc
 - Ultrasound guided core for masses, etc
 - MRI guided core needle biopsy



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ADVANTAGES MINIMALLY INVASIVE BIOPSY

- Less formidable
- Avoids open surgery
- If benign, diagnosis requires correlation with imaging; surgery can be avoided
- Placement of clip marker indicates location of biopsy on future imaging studies
- There is always the *option* for patient to change her mind and have lesion removed after discussion with her surgeon



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ADVANTAGES MINIMALLY INVASIVE BIOPSY

- If malignant, permits full evaluation before surgery
 - MRI of both breasts
 - Metastatic workup
- Patient has opportunity to discuss management options, obtain additional opinions before undergoing definitive surgery
- No harm in reasonable delay between diagnosis and treatment
 - Initially difficult to accept, now universal

SURGICAL ADVANCES-THERAPEUTIC

- Earlier diagnosis leads to “smaller” disease, less extensive surgery, and better outcome
- Noninvasive cancers now 25% of total
- Breast conservation as an alternative to mastectomy is well established in selective patients
- Sentinel lymph node biopsy to avoid full axillary lymph node dissection

BREAST CONSERVATION THERAPY

- THE most important surgical advance of our lifetime
- 1924 Dr. Geoffrey Keynes (London) treated operative breast cancer patients conservatively
- First clinical trial publications:
 - 1981 – Veronesi (Milan), 1973-1980
 - 1985 – Fisher (NSABP), 1976-1984
- Begun at Jefferson in the late 1970’s – Dr. Gordon Schwartz
- Begun “for real” in the 1980’s – first publication from Jefferson in 1984

BREAST CONSERVATION THERAPY LANDMARK STUDIES-MOST QUOTED TRIAL DATA

- **Veronesi et al:** NEJM, 347: 1227-1232, 2002
Twenty-Year Followup: Comparing Breast-Conserving Surgery with Radical Mastectomy
- 701 WOMEN
- NO DIFFERENCE between mastectomy vs BCT



BREAST CONSERVATION THERAPY LANDMARK STUDIES-MOST QUOTED TRIAL DATA

- **NSABP B-06:** NEJM, 347: 1233-1241, 2002 Twenty-Year Followup: Comparing Total Mastectomy, Lumpectomy, and Lumpectomy plus Irradiation
- 1851 women
- NO DIFFERENCE between mastectomy vs BCT



BREAST CONSERVATION THERAPY

- Wide excision of primary lesion: aesthetics balanced with oncologic effectiveness
- Is there any size limit? Probably not so long as margins clear and cosmesis acceptable
- If > 3cm, consider neoadjuvant chemotherapy
- Oncoplastic procedures may play a role if large tumor and neoadjuvant chemotherapy not undertaken
- Detailed imaging to exclude multiple cancers, diffuse calcifications, contralateral lesions

BREAST CONSERVATION THERAPY

- “Clean” margins
 - Frozen sections of margins not feasible
 - Clean vs clean margins
 - Occasional reexcision of positive margins
 - Should be less than 20% of patients
- Shave the margins (superior, medial, lateral, inferior, base) and apply smallest titanium clips to these sites
- Many of us prefer 10mm margins, if possible
- Margin of 2mm or greater acceptable before radiation therapy



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BREAST CONSERVATION THERAPY

- Oncoplastic breast surgery
 - Partial mastectomy with *wide* margins followed by *partial* breast reconstruction
 - Wider margin of resection → reduced local recurrence rate approaching LRR for mastectomy
 - Advantages:
 - Breast defects reduced while maintaining oncologic principles
 - Able to preserve nipple-areolar complex



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BREAST CONSERVATION THERAPY

- Oncoplastic breast surgery
 - Volume displacement reconstruction
 - Adjacent tissue rearrangement
 - Mastopexy
 - Reduction mammoplasty
 - Volume replacement reconstruction
 - Local or remote flaps
 - Autologous tissue reconstruction, such as lat miniflap, lat chest wall perforator flap
 - Delayed oncoplastic reconstruction if margins in question



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BREAST CONSERVATION THERAPY

- Radiation therapy follows local excision in most patients
 - Whole breast radiation therapy with boost radiation to primary site
 - Partial breast radiation therapy
- When can (should) it be omitted?
 - Pregnancy
 - Co-morbid, life-threatening illnesses
 - Tubular carcinoma, <1cm?
 - DCIS? (A major current controversy)



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BREAST CONSERVATION THERAPY

- Accelerated partial breast irradiation
 - 80-90% of local recurrence after partial mastectomy occur at or near original site
 - RT to lumpectomy cavity with 1-2 cm margin twice a day for 5 days
 - Criteria for patient selection
 - NSABP B-39 clinical trial will provide answers about the efficacy of partial breast irradiation (versus whole breast radiation therapy – “tried and true”)
 - As surgeons, place catheter/device in cavity at time of surgery or in office with US guidance



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BREAST CONSERVATION THERAPY

- Intraoperative radiation therapy
 - Attempt to decrease overall treatment time for radiation after partial mastectomy
 - Radiation therapy is given at the time of surgery or 1-3 days post surgery after final pathology available
 - Photon, electron, external beam.....
 - As surgeons, participate in this team approach in BCT
 - Radiates cavity & approximately 1 cm beyond
 - Advantage: One dose of radiation intraoperatively
 - Disadvantage: Ongoing data collection



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MASTECTOMY

- Making a comeback of sorts
- Mastectomy is always an option for patient (vs breast conservation therapy)
- Detailed imaging studies find multifocal/multicentric disease and contralateral cancer
- Increased use of genetic testing

MASTECTOMY

- Radical mastectomy – seldom indicated today
- Modified radical mastectomy
- Total mastectomy
- Reconstruction after mastectomy
 - Integral in management of breast cancer
 - Some patients elect no reconstruction
 - Immediate or delayed

MASTECTOMY

- Skin-sparing total mastectomy
 - If patient is undergoing immediate reconstruction
 - Small elliptical incision around nipple-areolar complex if using implants
 - Circular circumareolar incision (or just inside nipple-areolar complex) if autologous breast reconstruction
 - Some studies show local recurrence is similar to conventional mastectomy, if done properly
 - Local recurrence after skin-sparing mastectomy most likely related to tumor biology rather than preservation of skin
 - Local recurrence not associated with systemic relapse

MASTECTOMY

- Nipple-sparing mastectomy
 - Essentially same operation as subcutaneous mastectomy
 - Skin-sparing mastectomy with retention of nipple-areolar complex
 - May help patient with “the loss”
 - Some studies show local recurrence similar to skin-sparing mastectomy
 - Highly selective patient population
 - Careful removal of tissue from base of nipple
 - American Society of Breast Surgeons Registry

MASTECTOMY

- Breast reconstruction after mastectomy
 - Prosthetic breast reconstruction
 - Most common method of reconstruction after mastectomy
 - Usually two stages: temporary tissue expander in subpectoral position, then exchange to permanent implant
 - Saline implants
 - Silicone gel implants – not cause connective tissue disorder, peripheral neuropathy, chronic fatigue syndrome, etc
 - Acellular dermal matrices
 - Lack of antigenicity, incorporate into host tissue
 - Expand pectoralis major muscle (in place of serratus muscle)
 - Usually good for 10-15 years
 - Not as good results in irradiated breasts

MASTECTOMY

- Breast reconstruction after mastectomy
 - Autologous breast reconstruction
 - Transverse rectus abdominis musculocutaneous (TRAM) flap
 - Latissimus dorsi flap
 - Deep inferior epigastric artery (DIEP) flap
 - Superior gluteal artery perforator (SGAP) flap
 - Free flap

MASTECTOMY

- Prophylactic mastectomy
 - Effective in risk reduction
 - Reconstruction always an option
 - Often encouraged after diagnosis of BRCA 1 or 2 mutation
 - Increasing choice in patients without BRCA mutation and with contralateral breast cancer
 - Choice of some patients with strong family history of breast cancer without a mutation



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MASTECTOMY

- Hereditary breast cancer – BRCA 1 or 2 mutation
 - Not more than 5-10% of cancers due to mutation, at this time
 - Goal should be to identify carriers before they develop cancer
 - Often only suspected after the diagnosis
 - If suspected after diagnosis, can defer surgery until testing is completed to consider bilateral mastectomy
 - Also consider bilateral oophorectomy



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AXILLARY NODE SURGERY

- Lymph node assessment and treatment
 - Argument about axillary node surgery as staging or treatment remains controversial
 - Value of information is crucial to further treatment planning
- Exception to lymph node assessment
 - Pregnant patient – little data effects of isosulfan blue and technetium sulfur colloid dyes on fetus
 - Elderly patient with clinically negative nodes



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SENTINEL LYMPH NODE BIOPSY

- Second most important advance in breast surgery in our lifetime
- First node to which the cancer would spread
- If negative, the other nodes are also negative – no axillary dissection necessary
- If positive, then axillary dissection performed
- Avoids complications – lymphedema, infection, restriction of arm range of motion
- Not a substitute for judgment just because few complications



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AXILLARY DISSECTION: NEW STANDARD OF CARE?

- Newer standard of care: Sentinel lymph node biopsy/dissection (SLND)
 - Standard of care at this time is for patient to undergo ALND if SLN is positive
 - But do we need to do an ALND on ALL positive SLN patients?
 - If so, which group is safe for no ALND?
- Three Level I clinical trials to answer these questions
- Will these studies change practice patterns, standard of care?



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AXILLARY DISSECTION: NEW STANDARD OF CARE?

- The recommendation for axillary dissection for positive sentinel lymph is changing based on new data from three large level I clinical trials
 - ACOSOG Z0010 – IHC detected metastases appear to have no significant impact on 5 year survival
 - NSABP B32 – Absolute difference in overall survival at 8 years was only 1.2% between SLN+ALND versus SLN alone
 - ACOSOG Z0011 – No difference between ALND versus NO ALND in patients with limited SLN mets treated with BCT and appropriate systemic therapy (included patients with 1-2 positive SLN's)



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AXILLARY DISSECTION: NEW STANDARD OF CARE?

- Axillary lymph node dissection may not be necessary in all patients
- Other modalities to diagnosis lymph node positivity (vs sentinel lymph node biopsy) – fine needle aspiration or core needle biopsy with ultrasound guidance
- In selected patients, use of radiation therapy only without any axillary surgical procedure



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NEOADJUVANT CHEMOTHERAPY

- “Chemo first” prior to any surgical treatment
- Primary goal is to treat *systemic* disease
- Initially offered to “inoperable” or patients with locally advanced disease (T3-4, N1-2)
- Now commonly used in T2 patients with tumors > 3cm and T1-2 N1 cancers
 - Up to 20% of patients with complete pathologic response to chemotherapy
 - Alter local therapy from mastectomy to BCT in many patients
- A consideration in many triple negative cancers



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GENETIC ANALYSIS OF BREAST CANCERS

- Analysis of genetic profile of breast cancers to plan appropriate adjuvant therapy
 - Oncotype Dx, Agendia MammaPrint
- Separation of “low” and “high” risk cancers
- Currently used to influence decisions about adjuvant chemotherapy
- Sometimes used to determine efficacy of neoadjuvant chemotherapy – can we use this information to predict outcome of neoadjuvant chemotherapy? Should we proceed to surgery first?
- When will they be used to plan initial therapy?



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FUTURE

- In our lifetimes we have seen surgery for breast cancer become less formidable as earlier cancers are found and treated
- We have incorporated more minimally invasive procedures to avoid extensive surgery unless necessary or desired by patient
- “Less is more” – in breast surgery, this is happening (breast conservation therapy, sentinel lymph node biopsy, etc)



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FUTURE

- Breast conservation therapy was the goal
- But some data suggest that there may be a role for more extensive surgery and therapy (for example, mastectomy followed by post-mastectomy radiation)
- Attitudes are changing also and bilateral mastectomy are not so uncommon
- Prophylactic mastectomy are also not uncommon



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FUTURE

- Breast cancer treatment is multidisciplinary and a team effort
- Each patient has a unique treatment plan
- Future of “personalized medicine”
 - Targeted therapy
 - Molecular profiling of each patient’s individual cancer to determine best therapy
 - When can we expect molecular biologists to make breast cancer preventable – a genetic “tweak”?



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