

Evolution of Breast Surgery

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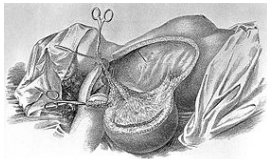
Minneapolis, MN

Definitions

- Radical Mastectomy:**
Removal of breast, chest muscles, and axillary lymph nodes
- Modified Radical Mastectomy:**
Removal of breast and axillary lymph nodes
- Breast Conserving Surgery (BCS):**
Removal of the cancer and a margin of normal tissue, but not the breast itself
- Sentinel Lymph Node (SLN):**
The first lymph node to which cancer is likely to spread from the primary tumor
- Completion Lymph Node Dissection (CLND):**
Removal of the remaining lymph nodes after SLN

Breast Cancer Surgery 1890-1950s

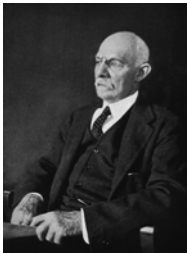
RADICAL MASTECTOMY



Breast Cancer Surgery 1890-1950s

Dr. William S Halsted

Considered the father of modern surgery
First described mastectomy for cancer treatment in 1882
Represented a milestone in treatment of breast cancer
No other options at that time
Belief that the more extensive the surgery, the less likely cancer would return



Breast Cancer Surgery 1890-1950s



- Extremely disfiguring surgery
- Recurrence rates profoundly high
- Survival was dismal
- No chemotherapy, no endocrine therapy, no radiation therapy

Breast Cancer Surgery 1960-1990s

MODIFIED RADICAL MASTECTOMY

Breast Cancer Surgery 1960-1990s

- Change of thought process: cancer aggressiveness may be dictated by biology, not technical maneuvers
- Started offering simple or modified radical mastectomy in the early 1950s
- This lead to one of the earliest of clinical trials



Breast Cancer Surgery 1960-1990s

Dr. Bernard Fisher and NSABP -04

- Initiated in 1971
- 1700 patients from 34 institutions
- Randomized patients to radical mastectomy, simple mastectomy with no nodal surgery and with radiation, or total mastectomy with nodal surgery but without radiation
- No differences with respect to disease-free or overall survival, with long term follow up
- Paved the way for lesser and lesser surgical approaches

Fisher B et al, NEJM, 1985

Breast Cancer Surgery 1990 - current

*"Biology is King
Selection is Queen
Technical maneuvers are the Prince and Princess*


*Occasionally the prince and princess try to
overthrow the powerful forces of the King and
Queen, sometimes with temporary apparent
victories, but usually to no long term avail"*

--Blake Cady, MD

Breast Cancer Surgery 1990 - current

BREAST CONSERVING SURGERY

(versus mastectomy)



SENTINEL LYMPH NODE BIOPSY

NODAL IRRADIATION

(versus complete nodal dissection)

Breast Cancer Surgery 1990 - current

NSABP - B06

- Randomized prospective trial

- Compared mastectomy to lumpectomy plus radiation to lumpectomy alone

- No difference in survival


- Modest decrease in local recurrence with mastectomy

- More contemporary data suggest even lower rates of local recurrence in modern treatment era.

Fisher B et al. NEJM, 2002


Breast Cancer Surgery 1990 - current

Breast conservation



Breast Cancer Surgery 1990 - current

BREAST CONSERVING SURGERY
(versus mastectomy)



SENTINEL LYMPH NODE BIOPSY
NODAL IRRADIATION
(versus complete nodal dissection)

Breast Cancer Surgery 1990 - current

Nodal Surgery:

- Axillary nodal dissection routinely performed in early surgery for local control and staging
- Morbid operation:
 - Lymphedema, shoulder dysfunction, pain, paresthesias
- Rate of nodal metastases in a clinically negative axilla is 15-26%
- No survival benefit to removing **BENIGN** nodes

Breast Cancer Surgery 1990 - current

Sentinel Node:
NSABP - B32

- Randomized prospective trial
- 5611 patients
- Randomized to SLN plus ALND **versus** SLND with ALND only if SLN +
- No difference in survival
- No difference in local control
- **Significant change** in management of axilla

Positive SLN
ACOSOG Z0011

- Known since NSABP B-04: No survival advantage to CLND
- Randomized to SLN plus ALND if SLN + **versus** SLN plus radiation if SLN +
- No difference in survival
- No difference in local control
- **ANOTHER significant change** in management of axilla

Krag D et al, Lancet, 2010
Giuliano A et al, JAMA 2011

Breast Cancer Surgery 1990 - current

Surgical Decisions 1990s – 2000s

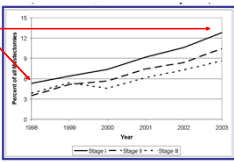
- Consensus statements favoring breast conservation
 - Minimal surgery for same oncologic outcome
 - Low recurrence rates, very low axillary failure rates
 - Lower complication rates
 - No hospital stay for most

Breast Cancer Surgery 1990 - current

Surgical Decisions 1990s – 2000s

- Consensus statements favoring breast conservation
- Upswing in mastectomy and contralateral mastectomy

200% increase in mastectomy among women with early stage cancer



- Result of:
- Increased MRI use
 - Increased awareness of BRCA mutation
 - Improvement in reconstruction techniques and access
 - Increased BMI

Tuttle T et al. JCO 2007

Breast Cancer Surgery 1990 - current

SKIN SPARING MASTECTOMY AND CONTRALATERAL PROPHYLACTIC MASTECTOMY



Breast Cancer Surgery 1990 - current

NIPPLE SPARING MASTECTOMY AND
CONTRALATERAL PROPHYLACTIC MASTECTOMY



Breast Cancer Surgery
Future Directions

- **Observation**
COMET trial
- **Non-operative ablation**
Radiofrequency, cryoablation
- **Observation after neoadjuvant therapy**
- **Oncoplastics**
Larger lumpectomy with breast reconstructions
- **Less radiation**
- **Axillary management**

Summary

- **Large randomized trials have demonstrated:**
 - No survival advantage to mastectomy versus breast conservation
 - No survival advantage to radical axillary surgery
- **Future directions will likely prove to be even less invasive**

Credits

*Thanks to Doctors Tim Schaefer and Mark
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educational images*

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