Principles of Breast Surgery
Oncoplastic Surgery

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Conflict of Interest Disclosure

• No financial relationships to disclose
Locorregional therapy for early breast cancer

- Conservative (BCT) vs Mastectomy
- Oncoplastic Surgery
- Delayed Reconstruction vs Immediate Reconstruction
- Total mastectomy vs Skin Sparing Mastectomy
- Surgery after primary systemic treatment (PST)
- Sentinel Node vs Axillary dissection
Overview of guidelines on breast screening: Why recommendations differ and what to do about it
Karsten Juhl Jørgensen, Mette Kalager, Alexandra Barratt, Cornelia Baines, Per-Henrik Zahl, John Brodersen, Russell P. Harris

Overdiagnosis in breast imaging
Andy Evans, Sarah Vinnicombe

Finding the balance between over- and under-treatment of ductal carcinoma in situ (DCIS)

Oversurgery in invasive breast cancer
Fiona MacNeill

Overexploring and overtreating the axilla
Viviana Galimberti, Giovanni Corso, Simonetta Monti, Gianmatteo Pagani

Over-irradiation
Philip M.P. Poortmans, Meritxell Arenas, Lorenzo Livi

Over-using chemotherapy in the adjuvant setting
Giuseppe Curigliano, Carmen Crisçitiello, Angela Esposito and Giancarlo Pruneri

Over-treatment in metastatic breast cancer
Elżbieta Senkus, Aleksandra Łacko

Imaging in the evaluation and follow-up of early and advanced breast cancer: When, why, and how often?
Brittany L. Bychkovsky, Nancy U. Lin
- Conservative (BCT) vs Mastectomy

Breast cancer screening programs

Increase mass awareness

Patients with earlier stages presenting to clinic

BREAST CONSERVING SURGERY

Better psyco-social Adjustment

Better Quality of life
Conservative (BCT) vs Mastectomy

MRM vs BCT
Randomized trials
Meta-analysis

Comparable local control, Overall survival

Better cosmetic outcome
Conservative (BCT) vs Mastectomy


.....as long as a good aesthetic outcome is obtained
Conservative (BCT) vs Mastectomy

Figure 1. Temporal Trends in Surgical Treatment of Early Breast Cancer

Figure 3. Temporal Trends in Type of Mastectomy for Early Breast Cancer

Kummerow K
JAMA Surg 2015
- Conservative (BCT) vs Mastectomy

Gu J.
Clin Med Insights Oncol. 2017

Thematic map for mastectomy participants. BCT indicates breast conserving therapy; F/U, follow-up; Hx, history.

Thematic map for breast conserving therapy (BCT) participants.

PHYSICIANS INCAPACITY TO COMMUNICATE RISK
## Conservative (BCT) vs Mastectomy

**Original Investigation**

*Effect of Breast Conservation Therapy vs Mastectomy on Disease-Specific Survival for Early-Stage Breast Cancer*

Shalilesh Agarwal, MD; Lisa Pappas, MS; Leigh Neumayer, MD; Kristine Kokeny, MD; Jayant Agarwal, MD

<table>
<thead>
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**CONCLUSIONS AND RELEVANCE** Patients who underwent BCT have a higher breast cancer-specific survival rate compared with those treated with mastectomy alone or mastectomy with radiation for early-stage invasive ductal carcinoma. Further investigation is warranted to understand what may be contributing to this effect.
Breast conserving therapy and mastectomy revisited: Breast cancer-specific survival and the influence of prognostic factors in 129,692 patients

Mirelle Lagendijk1,2†, Marissa C. van Maaren2,3†, Sepideh Saadatmand4, Luc J.A. Strobbe5, Philip M.P. Poortmans6, Linetta B. Koppert1, Madeleine M.A. Tilanus-Linthorst1 and Sabine Siesling2,3

Gentilini 2017, Breast
Van Maaren 2017 IJC
Conservative (BCT) vs Mastectomy

Contra-indications for BCT

In aggregate, in the following clinical situations the increased risk of breast relapse should be extensively discussed with the patient and breast conservation should be executed with caution:

- very young woman (<35 years),
- the presence of extensive DCIS (heralded by extensive microcalcifications) mounting up to one quarter of the breast,
- more than focally incomplete resection of an invasive or in situ cancer,
- and in the case that radiotherapy cannot be given.

In all other clinical situations breast conservation is a safe option, provided complete resections are achieved and good cosmetic outcome is secured.


Who should not undergo breast conservation?
Nijenhuis MV1, Rutgers EJ.

Curr Treat Options Oncol. 2015 Apr;16(4):16.

Breast cancer under age 40: a different approach.
Ribnikar D1, Ribeiro JM, Pinto D, Sousa B, Pinto AC, Gomes E, Moser EC, Cardoso MJ, Cardoso F.
### Conservative (BCT) vs Mastectomy

**Margins**

The association of surgical margins and local recurrence in women with early-stage invasive breast cancer treated with breast-conserving therapy: a meta-analysis.
Houssami N1, Macaskill P, Marinovich ML, Morrow M.

Society of Surgical Oncology-American Society for Radiation Oncology consensus guideline on margins for breast-conserving surgery with whole-breast irradiation in stages I and II invasive breast cancer.
Ann Surg Oncol. 2014 Mar;21(3):704-16
J Clin Oncol. 2014 Feb 10
### Conservative (BCT) vs Mastectomy

1. **Positive margins**
   A positive margin, defined as ink on invasive cancer or ductal carcinoma in situ (DCIS), is associated with at least a 2-fold increase in IBTR. This increased risk in IBTR is not nullified by:
   
   a) Delivery of a boost dose of radiation
   
   b) Delivery of systemic therapy (endocrine therapy, chemotherapy, or biologic therapy), or
   
   c) Favorable biology

2. **Negative margin widths**
   Negative margins (no ink on tumor) minimize the risk of IBTR. Wider margin widths do not significantly lower this risk. The routine practice to obtain negative margin widths wider than no ink on tumor is not indicated.

3. **Systemic therapy**
   The rates of IBTR are reduced with the use of systemic therapy. In the uncommon circumstance of a patient not receiving adjuvant systemic therapy, there is no evidence suggesting that margins wider than no ink on tumor are needed.

4. **Biologic subtypes**
   Margins wider than no ink on tumor are not indicated based on biologic subtype.
5. Radiation therapy delivery
The choice of WBRT delivery technique, fractionation, and boost dose should not be dependent on margin width.

6. Invasive lobular carcinoma and lobular carcinoma in situ
Wider negative margins than no ink on tumor are not indicated for invasive lobular carcinoma (ILC). Classic lobular carcinoma in situ (LCIS) at the margin is not an indication for re-excision. The significance of pleomorphic LCIS at the margin is uncertain.

7. Young age
Young age (≤40 years) is associated with both increased IBTR after BCT as well as increased local relapse on the chest wall after mastectomy, and is also more frequently associated with adverse biologic and pathologic features. There is no evidence that increased margin width nullifies the increased risk of IBTR in young patients.

8. Extensive intra ductal component
Extensive intra ductal component (EIC) identifies patients who may have a large residual DCIS burden after lumpectomy. There is no evidence of an association between increased risk of IBTR and EIC when margins are negative.
**Conservative (BCT) vs Mastectomy**

The margin status of invasive carcinoma did not influence IBTR, DM rate, or OS. Between 1980 and 2008, locoregional control after BCT remained stable with low IBTR rates, even in young patients.

**Breast Cancer Res Treat. 2016 Apr;156(2):391-400.**

*Very low local recurrence rates after breast-conserving therapy: analysis of 8485 patients treated over a 28-year period.*

Conservative (BCT) vs Mastectomy

Still 30% of fair/poor results
Can we improve those results
Conservative (BCT) vs Mastectomy

http://medicalresearch.inescporto.pt/breastresearch

Towards an intelligent medical system for the aesthetic evaluation of breast cancer conservative treatment.
Cardoso JS1, Cardoso MJ.
Oncoplastic Surgery

When a resection of more than 20% of breast volume is planned oncoplastic techniques are recommended and can prevent major deformities.

Current approaches to managing partial breast defects: the role of conservative breast surgery reconstruction.

Munhoz AM1, Montag E, Filassi JR, Gemperli R.
- Oncoplastic Surgery

- Oncoplastic surgery is **tumor specific immediate breast reconstruction**.

- It represents the **integration of plastic surgery techniques into breast cancer surgery** in order to preserve aesthetical outcomes and quality of life of the patients, without compromising local control of disease.

- It is based on three surgical principles: **ideal breast cancer surgery with free tumour margins, immediate breast reconstruction, and immediate symmetry with the other breast**.

- Although the **word was originally coined by Werner Audrescht** in Germany in the 1990’s, plastic surgery techniques were transposed into breast-conserving therapy to avoid late unsatisfactory aesthetic results in the 1980’s France by Jean-Yves Petit (Institut Goustave- Roussy), Jean-Yves Bobin (Centre Leon-Berard) and Michel Abbes (Centre Lassagne).
## Oncoplastic Surgery

**Concept background**

- At the beginning limited to conservative surgery
- Correction of previous defects
- Use of aesthetic concepts in cancer
- **Oncoplastic Surgery**

  **Concept evolution**

  - correct oncological surgery
  - local reconstruction to correct excision defects
  - immediate or delayed reconstruction with access to all techniques
  - asymmetry correction on both sides

*Oncoplastic breast surgery--a guide to good practice.*
*On behalf of BASO, BAPRAS and TIGBS*
Oncoplastic Surgery

Although oncoplastic surgery is considered to be a major technical improvement it is associated with larger scars, increased complications and an increasing need for contralateral breast surgery.
## Oncoplastic Surgery

### Viewpoints and Debate

**Training in oncoplastic surgery: An international consensus. The 7th Portuguese Senology congress, Vilamoura, 2009**

Maria João Cardoso*, R Douglas Macmillan**, Belén Merck†, Alexandre Mendonça Munhoz‡, Richard Rainsbury*.

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‡Division of Plastic Surgery, University of São Paulo School of Medicine, Rua do Consolatório 3605 ap 99, 01861-901 São Paulo, Brazil
* Oncoplastic Breast Unit, Royal Hampshire County Hospital, Bursary Road, Winchester, Hampshire SP21 2EQ, UK
Oncoplastic Surgery

Pros
- Wider excisions - Better margins
- Less recurrences
- Overall better cosmetic outcomes

Cons
- Trained teams
- Higher cost
- Higher complication rate
- Possible delay of adjuvant treatments

Which technique to use for each case?
Oncoplastic Surgery

http://www.vph-picture.eu/
## Oncoplastic Surgery

### TABLE 1. Articles Included in Systematic Review

<table>
<thead>
<tr>
<th>Reference</th>
<th>Year</th>
<th>Patients/Cases</th>
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<th>Oncologic Outcomes Described</th>
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<td>26.5</td>
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Outcomes Following Oncoplastic Reduction Mammoplasty: A Systematic Review.
Piper ML, Esserman LJ, Sbitany H, Peled AW.
Ann Plast Surg. 2016 May;76 Suppl 3:S222

Maria João Cardoso
### Oncoplastic Surgery

#### TABLE 2. Articles Reporting Local-Regional and Distant Recurrence Rates

<table>
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<tr>
<th>Reference</th>
<th>Patients/Cases</th>
<th>Mean/Median Follow-up, mo</th>
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<td>I and II</td>
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*Studies that utilized intraoperative frozen section.*

Outcomes Following Oncoplastic Reduction Mammoplasty: A Systematic Review.
Piper ML, Esserman LJ, Sbitany H, Peled AW.
Ann Plast Surg. 2016 May;76 Suppl 3:S222

Maria João Cardoso
Delayed Reconstruction vs Immediate Reconstruction

Is immediate autologous breast reconstruction with postoperative radiotherapy good practice?: a systematic review of the literature.
Schaverien MV, Macmillan RD, McCulley SJ.
Delayed Reconstruction vs Immediate Reconstruction
- Delayed Reconstruction vs Immediate Reconstruction
- **Delayed Reconstruction vs Immediate Reconstruction**

- Reconstruction should be offered to all mastectomy patients and all techniques should be discussed even if not available locally.

- Immediate reconstruction can be performed in the majority of patients and does not reduce radiation efficacy.

- Patients who will probably need radiotherapy should be advised about the possibility of a poorer cosmetic outcome.
Total mastectomy vs Skin Sparing Mastectomy

Breast Reconstruction following Nipple-Sparing Mastectomy: Predictors of Complications, Reconstruction Outcomes, and 5-Year Trends.
Colwell AS, Tessler O, Lin AM et al.
Total mastectomy vs Skin Sparing Mastectomy
Total mastectomy vs Skin Sparing Mastectomy
Surgery after primary systemic treatment (PST)

.....without ever forgetting the importance of each discipline
Surgery after primary systemic treatment (PST)

- Primary systemic treatment (PST) is responsible for a greater percentage of BCT.
- All patients proposed to PST should have their tumor marked before initiating treatment.
- Candidates to PST are those whose tumor breast size ratio doesn’t allow conservative treatment with a favorable cosmetic outcome and those with locally advanced breast cancer (LABC).
- Biologic subtypes - Her2 positive/triple negative -” if not stage I “ (benefit of PST upfront)
SELECTION CRITERIA FOR BEST CANDIDATES

Factors that can predict high likelihood for pCR
TNBC, high grade, high Ki67 in ER +, HER+, young age

Higher likelihood:
- Age: < 40 years
- Tumor size: < 2 cm
- Histology: ductal
- Grade: high (G3)
- Proliferation: high Ki67
- ER: negative
- Intrinsic subtype: Basal-like or HER2-enriched

Lower likelihood:
- Age: ≥ 60 years
- Tumor size: > 4 cm
- Histology: lobular
- Grade: low (G1)
- Proliferation: low Ki67
- ER: positive
- Intrinsic subtype: luminal A

Surgery after primary systemic treatment (PST)

- Initial work-up of locorregional disease
- Monitoring response to treatment
- Axillary approach
- BCS after treatment
- Reconstructive surgery
Surgery after primary systemic treatment (PST)

Pre-treatment work-up

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Meta-analysis of Magnetic Resonance Imaging in Detecting Residual Breast Cancer After Neoadjuvant Therapy.


Maria João Cardoso
- Surgery after primary systemic treatment (PST)

Tattooing
Surgery after primary systemic treatment (PST)
- Surgery after primary systemic treatment (PST)
Sentinel Node vs Axillary dissection

Sentinel node biopsy is actually considered standard of care in patients with clinically and ultrasound negative axillae

Sentinel Node vs Axillary dissection

Recommendations

- Recommendation 1: Clinicians should not recommend axillary lymph node dissection (ALND) for women with early-stage breast cancer who do not have nodal metastases. Type: evidence based; benefits outweigh harms. Evidence quality: high. Strength of recommendation: strong.

- Recommendation 2.1: Clinicians should not recommend ALND for women with early-stage breast cancer who have one or two sentinel lymph node metastases and will receive breast-conserving surgery (BCS) with conventionally fractionated whole-breast radiotherapy. Type: evidence based; benefits outweigh harms. Evidence quality: high. Strength of recommendation: strong.

- Recommendation 2.2: Clinicians may offer ALND for women with early-stage breast cancer with nodal metastases found on SNB who will receive mastectomy. Type: evidence based; benefits outweigh harms. Evidence quality: low. Strength of recommendation: weak.

- Recommendation 3: Clinicians may offer SNB for women who have operable breast cancer who have the following circumstances:
  - DCIS/mastectomy
  - Prior breast/axillary surgery
  - PST

- Recommendation 4: There are insufficient data to change the 2005 recommendation that clinicians should not perform SNB for women who have early-stage breast cancer and are in the following circumstances:
  - LABC / Inflammatory
  - DCIS in BCS
  - Pregnancy – YES with radioisotope only
Omission of axillary dissection cN-, SLN+

1,2ACOSOG Z0011

- Axillary dissection
  0.5% regional recurrence1,2

- No axillary dissection
  0.9%1 → 1.1%2 regional recurrence

# Sentinel Node vs Axillary Dissection

**Ongoing trials on axillary management**

**Z0011 validation**

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<td>8</td>
<td>Italy, IEO S637/311 SOUND</td>
<td>T1cN0</td>
<td>No SLN vs SLN +/- ALND</td>
<td>DDFS</td>
<td>Jan 2012</td>
</tr>
</tbody>
</table>

Sentinel Node vs Axillary Dissection

Omission of ALND in cN+ patients
Sentinel after chemotherapy

- cN+ → cN0: SLN-> back up ALND

<table>
<thead>
<tr>
<th></th>
<th>ACOSOG 1071</th>
<th>SENTINA</th>
<th>SN-FNAC</th>
<th>Swedish(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>663</td>
<td>592</td>
<td>153</td>
<td>195</td>
</tr>
<tr>
<td>Identification</td>
<td>93%</td>
<td>80%</td>
<td>87.6%</td>
<td>77.9%</td>
</tr>
<tr>
<td>FNR overall</td>
<td>12.6%</td>
<td>14%</td>
<td>8.4%</td>
<td>14.1%</td>
</tr>
<tr>
<td>FNR with ≥ 3 SLN</td>
<td>9.1%</td>
<td>&lt;10%</td>
<td>4.9%  (≥ 2 SLN)</td>
<td>0</td>
</tr>
<tr>
<td>FNR with dual tracer</td>
<td>10.8%</td>
<td>8.6%</td>
<td>5.2%</td>
<td>13.4%</td>
</tr>
</tbody>
</table>

Sentinel Node vs Axillary Dissection

- For patients with operable BC who are candidates for PST, ultrasound of the axilla and FNA/CB of suspicious lymph nodes should be considered as part of the staging workup.
- SNB before PST does not offer particular clinical advantages and reduces the number of patients who could benefit from the down-staging effect of PST in the axillary nodes.
- SNB after PST is feasible and accurate with similar performance to SNB before PST (bigger samples). Neo-adjuvant protocol.
- By performing SNB after PST, up to 40 percent of patients who present with minimal involvement of axillary nodes may be spared from axillary dissection.
- Caution is however required for patients who present with clinically (or pathologically) involved nodes before PST (until further results of prospective trials are obtained).

Maria João Cardoso
The Breast Team