Breast Cancer Surgery
Oncological Aspects
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- **Versions 2002–2011:**
  Bauerfeind / Böhme / Costa / Gerber / Hanf / Junkermann / Kaufmann / Kümmel / Nitz / Rezai / Simon / Solomayer / Thomssen / Untch

- **Version 2012:**
  Fersis / Janni
### Pretherapeutic Assessment

<table>
<thead>
<tr>
<th>Procedure</th>
<th>LoE</th>
<th>Grade</th>
<th>GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palpation</td>
<td>5</td>
<td>D</td>
<td>++</td>
</tr>
<tr>
<td>Mammography</td>
<td>2b</td>
<td>B</td>
<td>++</td>
</tr>
<tr>
<td>Ultrasound (breast &amp; axilla)</td>
<td>2b</td>
<td>B</td>
<td>++</td>
</tr>
<tr>
<td>Minimalinvasive biopsy</td>
<td>1c</td>
<td>A</td>
<td>+</td>
</tr>
<tr>
<td>MRT</td>
<td>1c</td>
<td>B</td>
<td>+/-</td>
</tr>
</tbody>
</table>
Perioperative Staging

- History and physical examination

High metastatic potential and / or symptoms:

- Chest X-ray
- Liver ultrasound
- CT-scan
- Bone-scan
- FDG-PET or FDG-PET / CT
- Whole body MRI

Oxford / AGO LoE / GR

<table>
<thead>
<tr>
<th>Test</th>
<th>Oxford</th>
<th>AGO LoE</th>
<th>GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>History and physical examination</td>
<td>5</td>
<td>D</td>
<td>++</td>
</tr>
<tr>
<td>Chest X-ray</td>
<td>5</td>
<td>D</td>
<td>+</td>
</tr>
<tr>
<td>Liver ultrasound</td>
<td>5</td>
<td>D</td>
<td>+</td>
</tr>
<tr>
<td>CT-scan</td>
<td>5</td>
<td>D</td>
<td>+</td>
</tr>
<tr>
<td>Bone-scan</td>
<td>5</td>
<td>D</td>
<td>+</td>
</tr>
<tr>
<td>FDG-PET or FDG-PET / CT</td>
<td>4</td>
<td>C</td>
<td>-</td>
</tr>
<tr>
<td>Whole body MRI</td>
<td>4</td>
<td>C</td>
<td>-</td>
</tr>
</tbody>
</table>
Evidence of Surgical Procedure

- Survival rates after lumpectomy + XRT are equivalent to those after (modified) radical mastectomy
  
  - Survival rates after modified radical mastectomy are equivalent to those after radical mastectomy
  
  - Local recurrence rates after skin sparing mastectomy are equivalent to those after mastectomy
  
  - Conservation of the NAC is an adequate surgical procedure in tumors of the periphery of the gland and after tumor-free section of retroareolar tissue

<table>
<thead>
<tr>
<th>Evidence of Surgical Procedure</th>
<th>Oxford / AGO LoE / GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survival rates</td>
<td>1a A ++</td>
</tr>
<tr>
<td>Survival rates after modified</td>
<td>1b A ++</td>
</tr>
<tr>
<td>Local recurrence rates</td>
<td>2b B ++</td>
</tr>
<tr>
<td>Conservation of the NAC</td>
<td>4b C +</td>
</tr>
</tbody>
</table>
Breast Conservation: Surgical Technical Aspects

- Wire guided excisional biopsy in non-palpable lesion  
  \[ \text{Oxford / AGO LoE / GR: } 2b \text{ B } ++ \]

- Tumor-free margins required  
  \[ \text{Oxford / AGO LoE / GR: } 1a \text{ A } ++ \]

- Specimen radiography or ultrasound in non-palpable lesion  
  \[ \text{Oxford / AGO LoE / GR: } 2b \text{ B } ++ \]

- Immediate intraoperative re-excision for close margins (specimen radiography and/or intra-operative frozen section)  
  \[ \text{Oxford / AGO LoE / GR: } 1c \text{ B } ++ \]

- Re-excision required for involved margins (paraffin section)  
  \[ \text{Oxford / AGO LoE / GR: } 2b \text{ C } ++ \]

- Radionuclide guided localisation of occult lesions  
  \[ \text{Oxford / AGO LoE / GR: } 2b \text{ B } +/\- \]

- Therapeutic stereotactic excision alone  
  \[ \text{Oxford / AGO LoE / GR: } 4 \text{ D } - - \]
Breast Conservation Surgery (BCS)

- Multicentricity
- Positive microscopic margins after repeated excision
- Inflammatory breast cancer

pCR after neoadjuvanter Chemotherapy

Oxford / AGO LoE / GR

2b  B  -
2b  B  - -
2b  B  - -
+/-
Axillary Lymph Node Dissection

Axillary lymph node dissection (removal of 10+ LN)

- Endpoint: survival
- Endpoint: staging
- Endpoint: local control

Axillary lymph node dissection:

- DCIS
- cT1/2 cN0 (without prior sentinel)
- SN + (cT1/2 cN0; < 3 SN +, BCS + tangential radiation field, no subsequent axillary radiation, adequate systemic therapy)
- SN + (mic)
- SN (i+)
- SN + (mastectomy, > cT1/2)
- SN + (mastectomy, ≤ cT1/2)

Irradiation of the axillary lymph nodes in case of waiving further axillary staging
## Sentinel Lymph Node Excision (SNE): Indications I

<table>
<thead>
<tr>
<th>Oxford / AGO LoE / GR</th>
<th>Indication</th>
</tr>
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<tbody>
<tr>
<td>1b A ++</td>
<td>Clinically (cN0) / sonographically neg. axilla</td>
</tr>
<tr>
<td>1b A ++</td>
<td>T 1</td>
</tr>
<tr>
<td>2b B ++</td>
<td>T 2</td>
</tr>
<tr>
<td>3b B +</td>
<td>T 3</td>
</tr>
<tr>
<td>2b B +</td>
<td>Multifocal / multicentric lesions</td>
</tr>
</tbody>
</table>
| 3b B +/ -             | DCIS                         
|                       | ≥ 5 cm or 2,5 cm + high grade (see DCIS)                                   |
| 3b B +                | if mastectomy is required                                                  |
| 3b C +*               | Before primary chemotherapy                                               |
| 2b B +/ -*            | After primary systemic therapy                                             |
| 2b B +                | Male breast cancer                                                         |
| 2b B +                | In the elderly                                                             |
| 2b C +/-*             | Add. FNA or core Bx of LN (suspicious acc. to clinical / sonographic assessment) in order to enable SLN |

* Study participation recommended
**Sentinel Lymph Node Excision (SNE): Indications II**

- During pregnancy and/or breast feeding: **3 C +**
- After previous tumor excision: **2b B +**
- Previous major breast surgery (e.g. reduction mammoplasty, mastectomy): **3b C +/-**
- Ipsilateral breast recurrence after prior BCS and prior SNE: **4 D +/-**
- SN in the mammarian internal chain: **2b B -**
- After axillary surgery: **3b B -**
- Prophylactic bilateral/contralateral mastectomy: **3b B --**
- Inflammatory breast cancer: **3b C --**
Surgery after Neoadjuvant Therapy (NT)

- Precise documentation of tumor location before, during and after NT
- Adequate surgery after NT
- Microscopically clear margins
- Tumor resection in the new margins
- Sentinel node biopsy if feasible

Oxford / AGO LoE / GR

- Precise documentation of tumor location: 5 D ++
- Adequate surgery after NT: 2b C ++
- Microscopically clear margins: 5 D ++
- Tumor resection in the new margins: 3b C +
- Sentinel node biopsy if feasible: 2b B +/-*

* Study participation recommended
Breast surgery:

After the nadir of the leucocyte count
(2 to 4 weeks after the last chemotherapy)

Irradiation after Mastectomy is recommended
< 6 weeks after surgery
Indication based on the initial stage prior NT
(cN+, cT3/4a-d)
Surgery after Neoadjuvant Therapy (NT)

Breast conservation after clinical response possible:

- Multicentric lesion  
  - Oxford / AGO LoE / GR: 3 C +/-*

- cT4a-c  
  - Oxford / AGO LoE / GR: 2b B +/-*

- Inflammatory breast cancer (in case of pCR)  
  - Oxford / AGO LoE / GR: 2b C +/-*

Mastectomy is recommended:

- If after re-excision no clear margins are achieved  
  - Oxford / AGO LoE / GR: 2b C ++

- Extensive microcalcifications  
  - Oxford / AGO LoE / GR: 5 D ++

- If irradiation is not feasible  
  - Oxford / AGO LoE / GR: 5 D ++

* Study participation recommended
Adjuvant Therapy after Primary Surgery

- Start adjuvant systemic therapy and RT as soon as possible (a.s.a.p.) after surgery
  - Level of Evidence (LoE): 1b
  - Grade of Recommendation (GR): A
  - Support: ++

- Start of adjuvant chemotherapy after surgery a.s.a.p., and prior to RT
  - Level of Evidence (LoE): 1b
  - Grade of Recommendation (GR): A
  - Support: ++

Without cytotoxic therapy:

- Start irradiation 6-8 weeks after surgery
  - Level of Evidence (LoE): 2b
  - Grade of Recommendation (GR): B
  - Support: ++

- Start endocrine therapy after surgery and a.s.a.p.
  - Level of Evidence (LoE): 5
  - Grade of Recommendation (GR): D
  - Support: ++

- Tamoxifen concurrent with radiotherapy
  - Level of Evidence (LoE): 3b
  - Grade of Recommendation (GR): C
  - Support: +

- AI concurrent with radiotherapy
  - Level of Evidence (LoE): 2a
  - Grade of Recommendation (GR): B
  - Support: +/-