

Diagnosis and Treatment of Patients with early and advanced Breast Cancer



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Breast Cancer Surgery Oncological Aspects

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FORSCHEN
LEHREN
HEILEN

Breast Cancer Surgery

Oncological Aspects

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- **Versionen 2002–2018:**
Bauerfeind / Blohmer / Böhme / Brunnert / Costa / Fersis / Gerber / Hanf / Janni / Junkermann / Kaufmann / Kühn / Kümmel / Nitz / Rezai / Simon / Solomayer / Thomssen / Thill / Untch
- **Version 2019:**
Möbus/Kühn

Breast Cancer Surgery

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AGO: ++

Surgery is one sub-step out of multiple steps in breast cancer treatment. Thus, both a diagnostic and an oncological expertise are an essential requirement for every breast surgeon

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Pretherapeutic Assessment of the Breast and the Axilla

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- **Clinical examination**
- **Mammography**
 - + Tomosynthesis (DBT)
- **Sonography**
 - Axilla CNB
- **Minimally invasive biopsy***
- **MRI****

| Oxford | | |
|--------|----|-----|
| LoE | GR | AGO |
| 5 | D | ++ |
| 2b | B | ++ |
| 3b | B | + |
| 2b | B | ++ |
| 2b | B | ++ |
| 1b | A | ++ |
| 1b | B | +/- |

* Histopathology of lesions if relevant for treatment

** MRI-guided vacuum biopsy is mandatory in case of MRI-detected additional lesions.

Individual decision for patients at high familiar risk, with dense breast (density 3-4/diagnostic assessability C-D), lobular invasive tumors, suspicion of multilocular disease. No reduction in reexcision rate.

Pretherapeutic Staging

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- History and clinical examination

Only recommended in high metastatic potential and/or symptoms (in decision making for chemotherapy and/or Her 2 – therapy)

- CT scan of thorax/abdomen

- Bone scan

- Chest X-ray

- Liver ultrasound

- FDG-PET or FDG-PET /CT

- Whole body MRI

- Liver – MRI in case of suspected liver metastases

| | Oxford | | |
|--|--------|----|-----|
| | LoE | GR | AGO |
| | 5 | D | ++ |
| | 2a | B | + |
| | 2b | B | + |
| | 5 | C | +/- |
| | 5 | D | +/- |
| | 3a | C | +/- |
| | 4 | C | +/- |
| | 4 | C | + |

Evidence of Surgical Procedure

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| | Oxford | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|-----|
| | LoE | GR | AGO |
| <ul style="list-style-type: none"> Survival rates after lumpectomy + XRT are equivalent to those after (modified) radical mastectomy | 1a | A | |
| <ul style="list-style-type: none"> Local recurrence rates after skin sparing mastectomy are equivalent to those after mastectomy | 2b | B | |
| <ul style="list-style-type: none"> Conservation of the NAC (nipple areola complex) is an adequate surgical procedure periphery of the gland and after tumor-free section, if R0 resection is achieved | 2b | C | |

Breast Conservation: Surgical Technical Aspects

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| | Oxford | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|-----|
| | LoE | GR | AGO |
| <ul style="list-style-type: none"> ■ Non-palpable lesion <ul style="list-style-type: none"> ■ Wire guided localisation ■ Radionuclide guided localisation ■ Specimen radiography or ultrasound | 2b | B | ++ |
| | 2b | B | +/- |
| | 2b | B | ++ |
| <ul style="list-style-type: none"> ■ Tumor-free margins required (also in unfavorable biology „no ink on tumor“ are enough) | 2a | A | ++ |
| <ul style="list-style-type: none"> ■ Immediate intraoperative re-excision for close margins (specimen radiography or ultrasound and/or intra-operative pathology) | 1c | B | ++ |
| <ul style="list-style-type: none"> ■ Re-excision required for involved margins (paraffin section) | 3b | C | + |
| <ul style="list-style-type: none"> ■ Therapeutic stereotactic excision alone | 4 | D | -- |
| <ul style="list-style-type: none"> ■ Ultrasound guided surgery to prevent re-excision | 1a | A | +/- |
| <ul style="list-style-type: none"> ■ Intraop. margin evaluation with margin probe | 1b | A | +/- |

Breast Conservation Surgery (BCS)

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

| | Oxford | | |
|--|-----------|----------|------------|
| | LoE | GR | AGO |
| | 2b | B | +/- |
| | 2b | B | -- |
| | 2b | B | -- |

**Surgery after neoadjuvant chemotherapy
go to chapter „neoadjuvant chemotherapy“**

Primary Axillary Lymph Node Dissection (ALND) I

Oxford

| | LoE | GR | AGO |
|-----------------------------------------------------------------------------------------------------------|-----|----|------|
| ▪ Endpoint: Survival | 3 | D | - |
| ▪ Endpoint Staging | 3 | A | - |
| ▪ Endpoint: Locoregional control | 2a | A | +/- |
| ▪ pN+ (pre-surgery) without neoadjuvant systemic therapy | 2a | B | + |
| ▪ cN0 pN0(sn)(i+) | 1b | A | -- |
| ▪ cN0 pN1(mi) | 2b | B | -- |
| ▪ cN0 pN 1(sn) (cT1/2 , < 3 SN +, BCS + tangential radiation field, adequate systemic therapy) | 1b | B | - |
| ▪ cN0 pN1 (sn) and mastectomy (no radiotherapy of the chestwall) | 1b | B | +* |
| ▪ cN0 pN1(sn) and mastectomy (T1/2, <3SN+) (radiotherapy of the chestwall) | 5 | D | +/-* |
| ▪ ALND indicated, but not feasible | | | |
| ▪ Irradiation according to AMAROS-trial | 1b | B | + |

* Study participation recommended

Axillary Intervention and NACT

| SLNB before or after NACT bei cN0 | | | | | | |
|------------------------------------------------------|----------------------------------------|--------------------------|------------------------------------|----|---|-----|
| SLNB before NACT | | | | 2b | B | +/- |
| SLNB after NACT | | | | 2b | B | + |
| Further surgical procedures depending on SLNB status | | | | | | |
| cN-Status (before NACT)) | pN-Status (before NACT) | N-Status (after NACT) | Surgical Procedure (after NACT) | | | |
| cN0 | pN0(sn) | - | Nihil | 1a | A | + |
| cN0 | pN+(sn) according to ACOSOG Z0011 | ycN0 | Nihil | 5 | D | + |
| | | | Re-SN alone | 2b | B | - |
| | | | ALND | 3 | B | - |
| cN0 | pN+(sn) different from ACOSOG Z0011 | ycN0 | Re-SN alone | 2b | B | - |
| | | | ALND | 2b | B | + |
| | | | Axilla XRT | 2b | B | + |
| cN0 | Not done | ypN0(sn) | SN alone | 2b | B | + |
| | | | ALND | 2b | B | - |
| | | ypN1(sn) | ALND | 2b | B | + |
| | | | Axillary RT | 5 | B | + |
| cN+ | pN+ (CNB) | ycN0 | SN alone | 2b | B | +/- |
| | | | TAD inkl. SN | 3b | C | + |
| | | | ALND | 2b | B | +/- |
| cN+ | pN+ (CNB) | ypN1 (CNB) | ALND | 2B | B | ++ |

Improvement of the False-Negative Rate of SLNB after NACT in Patients with pN+ (CNB)



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- Removal of > 2 SLNs
- Combined tracer
- IHC and serial sections to detect micrometastases
- Exclusive LN localisation (Clip / Coil / Tattoo)
- Targeted Axillary Dissection (SLNB + removal of localised lymph node, if ycN0)

| Oxford | | |
|--------|----|------|
| LoE | GR | AGO |
| 3b | C | +/- |
| 3b | C | +/- |
| 2b | B | + |
| 3b | C | +/-* |
| 3b | C | +* |

TAD = Targeted Axillary Dissection;

* Study participation recommended

Reduction of individual failures for SLNB in pN1ycN0

The higher the probability for a ypN0 stage the lower is the individual failure risk from a specific false-negative rate

- Predictive Factors for conversion of the N-Stage
 - Young age
 - Intrinsic Subtype (ER neg, HER 2 pos)
 - Grade 3
 - N1 (vs N2)
 - pCR (breast)

Sentinel Lymph Node Biopsy (SLNB): Indications I

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- Clinically / sonographically neg. axilla (cN0)
- Add./CNB of LN (clinical/sonogr. suspicious)
in order to enable SLNB
- T 1–2
- T 3–4c
- Multifocal / multicentric lesions
- DCSI
 - Mastectomy
 - BCT
 - DCIS in male
- Male breast cancer
- In the elderly

| Oxford | | |
|--------|----|-----|
| LoE | GR | AGO |
| 1b | A | ++ |
| 2a | B | + |
| 2b | A | ++ |
| 3b | B | + |
| 2b | B | + |
| 3b | B | + |
| 3b | B | - |
| 5 | D | +/- |
| 2b | B | + |
| 3b | B | + |

Sentinel Lymph Node Excision (SNE): Indications II

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- **During pregnancy and / or breast feeding
(no blue dye)**
- **After previous tumor excision**
- **Previous major breast surgery
(e.g. reduction mammoplasty)**
- **Ipsilateral breast recurrence after prior BCS
and prior SNE**
- **SN in the mammarian internal chain**
- **After axillary surgery**
- **Prophylactic bilateral / contralateral mastectomy**
- **Inflammatory breast cancer**

| Oxford | | |
|--------|----|-----|
| LoE | GR | AGO |
| 3 | C | + |
| 2b | B | + |
| 3b | C | +/- |
| 4 | D | - |
| 2b | B | - |
| 3b | B | +/- |
| 3b | B | -- |
| 3b | C | - |

Sentinel Lymph Node Excision (SNE): Marking

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- **^{99m}Tc Kolloid**
- **Preoperative Lymphoscintigraphy**
- **Patent blue dye**
- **Methylen blue**
- **Indocyanin green (ICG)***
- **SPIO#**

| Oxford | | |
|--------|----|-----|
| LoE | GR | AGO |
| 1a | A | ++ |
| 1b | B | +/- |
| 1a | B | +/- |
| 4 | D | - |
| 2b | B | +/- |
| 2b | B | +/- |

Procedure after Neoadjuvant Therapy

| Oxford | | |
|--------|----|-----|
| LoE | GR | AGO |
| 5 | D | ++ |
| 2b | C | ++ |
| 2 | B | ++ |
| 2 | C | + |

- **Early Clip & Coil marking of tumor**
- **Surgical Removal of the tumor/tumor bed**
- **Microscopically clear margins**
- **Tumor resection in the new margins**

**For „Surgery after neoadjuvant chemotherapy“
see chapter „Neoadjuvant chemotherapy“**

Adjuvant Therapy after Primary Surgery

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- **Start adjuvant systemic therapy and Radiotherapy (RT) as soon as possible (a.s.a.p.) after surgery**
- **Start of adjuvant chemotherapy +/- Her2 therapy after surgery a.s.a.p., and prior to RT**

Without cytotoxic therapy +/- anti-HER2 therapy:

- **Start RT 6-8 weeks after surgery**
- **Start endocrine therapy after surgery and a.s.a.p.**
- **Endocrine therapy concurrent with radiotherapy**

| | Oxford | | |
|--|--------|----|-----|
| | LoE | GR | AGO |
| | 1b | A | ++ |
| | 1b | A | ++ |
| | 2b | B | ++ |
| | 5 | D | ++ |
| | 3b | C | + |