Ductal Carcinoma in Situ
(DCIS)
Duktales Carcinoma in situ (DCIS)

- **Versions 2002–2019:**
  Audretsch / Bauerfeind / Blohmer / Brunnert / Budach / Costa / Fersis / Friedrich / Gerber / Hanf / Junkermann / Kühn / Lux / Maass / Möbus / Mundhenke / Nitz / Oberhoff / Scharl / Schütz / Solomayer / Souchon / Thill / Thomssen / Wenz

- **Version 2020:**
  Friedrich / Gerber
Pretherapeutic Assessment of Suspicious Lesions (BIRADS 4-5)

- **Mammography**
  - Magnification view of microcalcifications
  - Increased detection rate of G1/G2 DCIS by full-field digital mammography (versus screen-film)

- **Stereotactic core needle / vacuum biopsy (VAB)**
  - Specimen radiography
  - Marker (clip) left at biopsy site for localization if lesion is completely removed

- **Assessment of extension**
  - MRI
  - Clinical examination
  - FNA / ductal lavage
  - Interdisciplinary board presentation

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Oxford LoE</th>
<th>AGO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography</td>
<td>1b B</td>
<td>++</td>
</tr>
<tr>
<td>Magnification view</td>
<td>4 C</td>
<td>++</td>
</tr>
<tr>
<td>Increased detection rate</td>
<td>2b B</td>
<td>+</td>
</tr>
<tr>
<td>Stereotactic core needle / VAB</td>
<td>2b B</td>
<td>++</td>
</tr>
<tr>
<td>Specimen radiography</td>
<td>2b B</td>
<td>++</td>
</tr>
<tr>
<td>Marker (clip)</td>
<td>5 D</td>
<td>++</td>
</tr>
<tr>
<td>MRI</td>
<td>1b B</td>
<td>+/-</td>
</tr>
<tr>
<td>Clinical examination</td>
<td>5 D</td>
<td>++</td>
</tr>
<tr>
<td>FNA / ductal lavage</td>
<td>5 D</td>
<td>-</td>
</tr>
<tr>
<td>Interdisciplinary board</td>
<td>5 D</td>
<td>++</td>
</tr>
</tbody>
</table>
Original Investigation

Breast Cancer Mortality After a Diagnosis of Ductal Carcinoma In Situ


- 108,196 patients from the SEER data base
- Retrospective analysis
- Breast cancer specific mortality 3.3 %
- Increased in young women (< 35 years) and black ethnicity
- The risk of death increases after ipsilateral invasive recurrence HR 18 (95%CI, 14,0–23,6)
- Prevention of invasive recurrence by radiotherapy does not diminish mortality at 10 years
## Breast Cancer Mortality After a Diagnosis of Ductal Carcinoma In Situ


### Treatment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Cases, No</th>
<th>10-Year BCS Mortality (95%CI), %</th>
<th>Univariate HR (95% CI)</th>
<th>P Value</th>
<th>Multivariate(^3) HR (95%)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lumpectomy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without radiotherapy</td>
<td>19762</td>
<td>0.9 (0.7 - 1.1)</td>
<td>1 [Reference]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With radiotherapy</td>
<td>42250</td>
<td>0.8 (0.7 – 1.0)</td>
<td>0.86 (0.67 – 1.10)</td>
<td>0.22</td>
<td>0.81 (0.63 – 1.04)</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>all</strong></td>
<td>63319</td>
<td>0.8 (0.7 – 1.0)</td>
<td>1 [Reference]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unilateral mastectomy</td>
<td>19515</td>
<td>1.3 (1.1 – 1.5)</td>
<td>1.45 (1.18 – 1.79)</td>
<td>&lt; 0.001</td>
<td>1.20 (0.96 – 1.50)</td>
<td>0.11</td>
</tr>
</tbody>
</table>

\(^3\) Adjusted for year of diagnosis, age of diagnosis, ethnicity, income, ER-status, tumor size and grade
General Therapeutic Principles

Surgical excision (BCS or mastectomy) is the standard treatment for DCIS.

Adjuvant treatment (radiotherapy, endocrine treatment) must be discussed with the patient individually. Adverse effects should be weighed against risk reduction.
Surgical Treatment for Histologically Proven DCIS I

- **Excisional biopsy (wire guided)**
  - Oxford: 2b B ++

- **Bracketing wire localization in large lesions**
  - Oxford: 3a C +

- **Specimen radiography**
  - Oxford: 2b B ++

- **Intraoperative ultrasound (visible lesion)**
  - Oxford: 3a C +/-

- **Immediate re-excision for close margins (specimen radiography)**
  - Oxford: 1c B ++

- **Intraoperative frozen section (in individual cases for margin assessment)**
  - Oxford: 3a D +/-

- **Interdisciplinary board presentation**
  - Oxford: 2b C ++

Open biopsy in suspicious lesions (mammographic microcalcifications, suspicious US, MRI etc.) without preoperative needle biopsy should be avoided
Surgical Treatment for Histologically Proven DCIS II

- **Histologically clear margins (R0)**
  - Oxford: LoE 1a, GR A, AGO ++

- **Multifocal DCIS: BCS if feasible**
  - Oxford: LoE 2b, GR B, AGO +

- **Re-excision required for close margin (≤ 2 mm in paraffin section)**
  - Oxford: LoE 2b, GR C, AGO +

- **Mastectomy**
  - Oxford: LoE 2a, GR B, AGO ++
    - Large lesions confirmed by multiple biopsies; no clear margins after re-excision

- **SLNE**
  - Oxford: LoE 3b, GR B, AGO +
    - Mastectomy
    - BCS
    - In case of DCIS in the male breast

- **ALND**
  - Oxford: LoE 2b, GR B, AGO −

* Especially if postoperative radiation therapy is not performed
** Patients who present with a palpable mass have a significantly higher potential for occult invasion (26%), multicentricity and local recurrence.
# Prognostic Factors for an Ipsilateral Recurrence

<table>
<thead>
<tr>
<th>Factor</th>
<th>Oxford LoE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resection margins</td>
<td>1a</td>
</tr>
<tr>
<td>Age</td>
<td>1a</td>
</tr>
<tr>
<td>Size</td>
<td>1a</td>
</tr>
<tr>
<td>Grade</td>
<td>1a</td>
</tr>
<tr>
<td>Comedo necrosis</td>
<td>1a</td>
</tr>
<tr>
<td>Method of diagnosis</td>
<td>1a</td>
</tr>
<tr>
<td>Focality</td>
<td>1a</td>
</tr>
<tr>
<td>HER2-overexpression</td>
<td>1a</td>
</tr>
<tr>
<td>ER/PgR (positive vs. negative)</td>
<td>1a</td>
</tr>
<tr>
<td>Residual tumor-associated microcalcifications</td>
<td>2b</td>
</tr>
<tr>
<td>Architecture</td>
<td>2b</td>
</tr>
<tr>
<td>(modified) Van Nuys Prognostic Index</td>
<td>2b</td>
</tr>
<tr>
<td>Palpable DCIS</td>
<td>2b</td>
</tr>
<tr>
<td>Palpable and ER-, HER2+, Ki-67+</td>
<td>2b</td>
</tr>
<tr>
<td>DCIS-Score (9 Gene recurrence score)</td>
<td>2b</td>
</tr>
<tr>
<td>MSKCC Nomogram</td>
<td>2b</td>
</tr>
<tr>
<td>Intrinsic subtypes (luminal A, B, HER2+, triple negative)</td>
<td>2b</td>
</tr>
</tbody>
</table>
DCIS Radiotherapy Statements

- Radiotherapy has no impact on survival
- Radiotherapy reduces the risk of ipsilateral (invasive and non invasive) recurrences by 50%
- Avoidance of invasive recurrence is probably not associated with survival benefit
- The absolute (individual) benefit of radiotherapy depends on the individual risk of local recurrence
- The number needed to treat (for ipsilateral breast recurrence) is 9 (over all risk groups)

LOE 1a  LOE 1a  LOE 2b
DCIS

Adjuvant Radiotherapy

Radiotherapy after:
- Breast conserving surgery (BCS)
- Mastectomy

Modality:
- Partial breast radiotherapy (PBI) (DCIS < 3 cm)
- Hypofractionated radiotherapy regimens
- Radiotherapy boost on the tumor bed
  - Women younger than 45-50 years
- Intraoperative Radiotherapy

Side effects and disadvantages must be weighed against risk reduction. Omitting radiotherapy implies elevated risk for local recurrence without effect for overall survival even in the subset of „good risk“ patients. Lack of level-1 evidence supporting the omission of adjuvant radiotherapy in selected low-risk cases: < 2.5 cm, low and intermediate nuclear grade, mammographically detected

* Analysis in ongoing trials
DCIS –
Adjuvant Systemic Treatment

- Adjuvant endocrine treatment has no impact on survival  
  LOE 1a
- Endocrine treatment may have a small effect on ipsilateral invasive and DCIS recurrences  
  LOE 1a
- Endocrine treatment for DCIS has an effect on contralateral invasive and non-invasive cancer  
  LOE 1a
- The number needed to treat for any ipsilateral breast event is 15  
  LOE 1a
## DCIS – Adjuvant Systemic Treatment

*Indication for treatment depends on risk factors, side effects and patient preference*

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Oxford LoE</th>
<th>AGO</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamoxifen (only ER+) 20mg</td>
<td>1a</td>
<td>+/-%</td>
<td>A</td>
</tr>
<tr>
<td>Tamoxifen (only ER+) 5mg (long-term data missing)</td>
<td>2b&lt;sup&gt;a&lt;/sup&gt;</td>
<td>+/-%</td>
<td>B</td>
</tr>
<tr>
<td>Aromatase inhibitor (only ER+) in postmenopausal women only</td>
<td>1b</td>
<td>+/-%</td>
<td>A</td>
</tr>
<tr>
<td>Trastuzumab (only HER2+)</td>
<td>5</td>
<td>--</td>
<td>D</td>
</tr>
</tbody>
</table>
Low dose Tamoxifen (5mg) in premalignant lesions

- **N = 500**

- **Follow up 5.69 years**
  - DCIS (69%), LCIS (11%), ADH (20%)

- **EFS: TAM 5.5% (14/253) vs. PLAC 11.3% (28/247)**

- **Severe adverse Event with same incidence** (Endometrial cancer TAM 1 vs. PLAC 0, thrombo-embolic event TAM 1 vs. PLAC 1)

- **Adherence TAM 65% vs. PLAC 61%** Lazzeroni M et al: Breast 2019
Therapy of Local DCIS Recurrence after Tumorectomy

After Radiation:

- Simple Mastectomy + SLNE
- Secondary breast conserving surgery

Without radiation after first tumorectomy

- Treatment like primary disease

Prognosis seems to be better for invasive recurrences than for primary invasive breast cancer. About 50% of recurrences are invasive.