Diagnostik und Therapie früher und fortgeschrittener Mammakarzinome

Adjuvante Strahlentherapie
Search Strategy
Search Terms: Radiotherapy Breast Cancer
Source: Pubmed 1/2010 – 1/2018

Effect of radiotherapy after mastectomy and axillary surgery on 10-year recurrence and 20-year breast cancer mortality: meta-analysis of individual patient data for 8135 women in 22 randomised trials

Effect of radiotherapy after breast-conserving surgery on 10-year recurrence and 15-year breast cancer death: meta-analysis of individual patient data for 10,801 women in 17 randomised trials
Overview of the randomized trials of radiotherapy in ductal carcinoma in situ of the breast

1. **DEGRO practical guidelines for radiotherapy of breast cancer IV: radiotherapy following mastectomy for invasive breast cancer**

**DEGRO practical guidelines: radiotherapy of breast cancer III--radiotherapy of the lymphatic pathways**

**DEGRO practical guidelines: radiotherapy of breast cancer I: radiotherapy following breast conserving therapy for invasive breast cancer**


7. Chan EK, Woods R2, McBride ML2, et al. Adjuvant hypofractionated versus conventional whole breast radiation therapy for early-


18. Haviland JS, Bentzen SM, Bliss JM et al On behalf of the START Trial Management Group. Prolongation of overall treatment time as a cause of treatment failure in early breast cancer: An analysis of the UK START (Standardisation of Breast Radiotherapy) trials of
radiotherapy fractionation. Radiotherapy and Oncology 121 (2016) 420–423


Radiotherapy (RT) after Breast Conserving Surgery (Invasive Cancer) - Partial Breast Irradiation -

Boost-RT (improves local control, no survival benefit)


Boost-RT in premenopausal p.
**Boost-RT in postmenopausal p.**


**Intraoperative irradiation (IORT/IOERT)**

As boost-irradiation followed by WBI


As sole radiotherapy modality

IORT using 50 kV (pT1 pN0 R0 G1-2, non-lobular, age >50 y, no extensive DCIS, IORT during first surgery, HR+)


>70 yrs


5. Vaidya JS, Wenz F, Bulsara M et al. An international randomised controlled trial to compare TARGeted Intraoperative radioTherapy
(TARGIT) with conventional postoperative radiotherapy after breast-conserving surgery for women with early-stage breast cancer (the TARGIT-A trial). Health Technol Assess 2016;20(73).


**Postoperative partial breast irradiation as sole radiotherapy modality (ABPI)**

**Interstitial brachytherapy**


**Interstitial brachytherapy >70 yrs**


**Intracavity balloon technique**


7. NCCN Guidelines for Treatment of Cancer by Site


Postmastectomy Radiotherapy (PMRT) to the Chest Wall in pts. with > 3 tumor infiltrated lymph nodes (Lnn.)


Postmastectomy Radiotherapy (PMRT) to the Chest Wall in pts. with 1–3 tumor infiltrated lymph nodes (Lnn.) high risk


8. NCCN Guidelines for Treatment of Cancer by Site


Postmastectomy Radiotherapy (PMRT) to the Chest Wall in pts. with 1–3 tumor infiltrated lymph nodes (Lnn) low risk


6. NCCN Guidelines for Treatment of Cancer by Site

Postmastectomy Radiotherapy (PMRT) to the Chest Wall in pts. with T3 / T4 breast cancer


Postmastectomy Radiotherapy (PMRT) to the Chest Wall in pts. with pT3 pN0 R0 breast cancer (and no additional risk factors)


Postmastectomy Radiotherapy (PMRT) to the Chest Wall in pts. with if R0 is impossible to reach (for invasive tumor)


6. Rowell NP. Radiotherapy to the chest wall following mastectomy for node-negative breast cancer: a systematic review. Radiother

Postmastectomy Radiotherapy (PMRT) to the Chest Wall in young pts with high risk features


Postmastectomy Radiotherapy (PMRT) to the Chest Wall in pts. after neoadjuvant chemotherapy) based on the initial stage prior to NACT (cN+, cT3/4a-d)


4. Rusthoven CG, Rabinovitch RA, Jones BL et al. The Impact of Postmastectomy and Regional Nodal Radiation after Neoadjuvant

Omission of Postmastectomy Radiotherapy (PMRT) to the Chest Wall after NACT in case of ypT0 ypN0 after NACT

Indications for Postmastectomy Radiotherapy (PMRT) to the Chest Wall and regional RT are independent of adjuvant systemic treatment

Effect of radiotherapy after mastectomy and axillary surgery on 10-year recurrence and 20-year breast cancer mortality: meta-analysis of individual patient data for 8135 women in 22 randomised trials.
DEGRO practical guidelines for radiotherapy of breast cancer IV: radiotherapy following mastectomy for invasive breast cancer.


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Boost bei PMRT

- Eine boost-Bestrahlung der Thoraxwand hat keinen Einfluss auf das brustkrebsspezifische und Gesamtüberleben
- Eine boost-Bestrahlung der Thoraxwand sollte nur bei nachgewiesener R1/R2-Situation ohne Möglichkeit einer Nachresektion erfolgen
- Reicht der Tumor nach Mastektomie (unter Mitnahme der Pectoralisfaszie) an den pectoralen Absetzungsrand heran und ist ein fastenüberschreitendes Tumorwachstum klinisch nicht zu erkennen, ist von einer R0-Situation auszugehen. Eine Boostbestrahlung ist nicht erforderlich

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Boost Thoraxwand und Gesamtüberleben


Tumor residuals after axillary dissection

1. Interdisziplinäre S3-Leitlinie für die Diagnostik, Therapie und Nachsorge des Mammakarzinoms Langversion 3.0, Aktualisierung 2012 AWMF-Register-Nummer: 032 – 045OL Leitlinie. Herausgeber: Leitlinienprogramm Onkologie der AWMF, Deutschen Krebsgesellschaft e.V. und Deutschen Krebshilfe e.V.

Sentinel node negative


Axillary dissection not indicated e.g. cN0, SLN positive (see surgical chapter)


Extracapsular tumor spread (ECS)


Axillary micrometastases or isolated cells found in regional lymph nodes

1-2 pos SLN: BCT: No further treatment to the axilla neither axillary dissection nor RT of the axilla (criteria according ACOSOG Z011)


1-2 pos SLN: BCT: Axillary dissection


1-2 pos SLN: BCT: radiotherapy of the axilla


1-2 pos SLN: Mastectomy: If RT of chestwall is indicated, axillary dissection or radiotherapy of the axilla


1-2 pos SLN: Mastectomy: If RT of chestwall is indicated, no axillary treatment (criteria ACOSOG Z011)
EXPERT OPINION, extrapolated from:


1-2 pos SLN: Mastectomy: If RT of chestwall is not planned, axillary dissection or radiotherapy of the axilla
EXPERT OPINION, extrapolated from:


>=3 positive SLN: Axillary LN dissection

1. Giuliano AE, Hunt KK, Ballmann KV, et al. Axillary dissection vs no axillary dissection in women with breast invasive cancer and


>=3 positive SLN: Radiotherapy of the axilla


Radiotherapy (RT) of Other Locoregional Lymph Node Areas (SCG/ICG) (15/20)


Supra-/infraclavicular lymphatic regions

RT to Supra-/infraclavicular lymphatic regions if ≥ pN2a


RT to Supra-/infraclavicular lymphatic regions if Level III involved


RT to Supra-/infraclavicular lymphatic regions if pN1a high risk


RT to Supra-/infraclavicular lymphatic regions if pN1a low risk


RT to Supra-/infraclavicular lymphatic regions if pN0 high risk, if radiotherapy of the internal mammaria Inn. chain is indicated (see below)


RT to Supra-/infraclavicular lymphatic regions after NACT/NAT (indications as for PMRT)


4. Rusthoven CG, Rabinovitch RA, Jones BL, et al. The Impact of Postmastectomy and Regional Nodal Radiation after Neoadjuvant
Radiotherapy (RT) of Other Locoregional Lymph Node Areas (IMN) - Slide 16/20

Internal mammary lymph node region (IMN)

RT to Internal mammary lymph node region (IMC) if pN0 high risk with central/medial tumors


RT to Internal mammaria lymph node region (IMN) if pN1-pN2 and HR positive in patients who had systemic chemotherapy


Multivariate Analysis of Overall Survival: Effect of Radiotherapy of the Internal Mammaria Lymph Nodes

<table>
<thead>
<tr>
<th>Adjuvant treatment</th>
<th>n*</th>
<th>Hazard ratio (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No adjuvant reported</td>
<td>623</td>
<td>0.91 (0.59 - 1.39)</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>954</td>
<td>1.05 (0.84 - 1.32)</td>
</tr>
<tr>
<td>Endocrine therapy</td>
<td>1185</td>
<td>0.82 (0.63 - 1.06)</td>
</tr>
<tr>
<td>Both (endocrine th. and chemotherapy)</td>
<td>1200</td>
<td>0.72 (0.55 - 0.94)</td>
</tr>
<tr>
<td>Total</td>
<td>4004</td>
<td>0.88 (0.76 - 1.01)</td>
</tr>
</tbody>
</table>

* missing data on 40 patients

Poormans et al. ECCO Amsterdam 2013
### Radiotherapie nach NACT

<table>
<thead>
<tr>
<th>Lokal fortgeschritten</th>
<th>Posttherapeutisch</th>
<th>RT-BET</th>
<th>PRTT</th>
<th>IRT-LAW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lokal fortgeschritten</td>
<td>pCR / keine pCR</td>
<td>ja</td>
<td>ja</td>
<td>ja</td>
</tr>
<tr>
<td>(T1/2, N0)*</td>
<td>ypT1/0-3, ypN0</td>
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</tr>
<tr>
<td>(T1/2, N1a)</td>
<td>ypT1/0-3, ypN1a</td>
<td>ja</td>
<td>nein</td>
<td>nein</td>
</tr>
</tbody>
</table>

**Lokal fortgeschritten: T3-4 oder cN2-N3**

1. Kriterien für hohes Rezidivrisiko:
   - pNO prämenopausal hohes Risiko: zentraler oder medialer Sitz, und (G2-3 und ER/PgR-negativ)
   - prätherapeutisch pN1a/ cN1+ hohes Risiko: zentraler oder medialer Sitz und (G2-3 oder ER/PgR-negativ) oder prämenopausal, lateraler Sitz und (G2-3 oder ER/PgR-negativ)
   - * = durch Stanzbiopsie gesichert

316. doi: 10.1056/NEJMoa1415340


Trastuzumab* concurrent with radiotherapy (*in HER2 pos tumors parasternal RT should generally be avoided; no concurrent trastuzumab in parasternal RT)


Tamoxifen concurrent with radiotherapy


AI (letrozole, anastrozole) concurrent with radiotherapy


**Pertuzumab concurrent with radiotherapy**


**T-DM1 concurrent with radiotherapy**


**Checkpointinhibitors concurrent with radiotherapy**

Extrapolated from trial results in other tumor entities and from current clinical trial in breast cancer

**Capecitabine and radiotherapy**


Other compounds (bevacizumab)