

Die loko-regionäre Therapie des frühen Mammakarzinoms – was ist Standard in 2026?

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Klinikum Detmold



Interessenskonflikte –

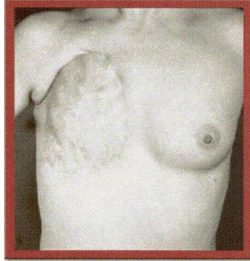
keine in Bezug auf die lokoregionäre Therapie des Mammakarzinoms

Aspekte heute – Lokale Therapie?

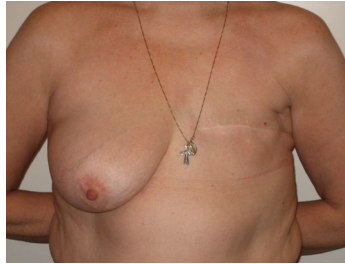
- Optimale Methode/Herangehensweise zur Diagnostik
 - MG, US, MRT,...
 - Lokalisation Brust u/o Axilla (prä- und intra-OP)
 - SLN-Tracer
- Deeskalation OP Radikalität (Brust u/o Axilla)
- Risikoreduzierenden Operationen
- Neue OP Techniken (z.B. roboterassistiert)
- Deeskalation Radiatio

Brusterhaltende Therapie beim Mammakarzinom

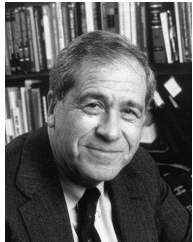
Radikale Mastektomie



Mastektomie



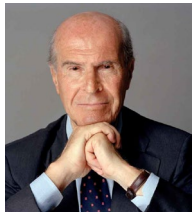
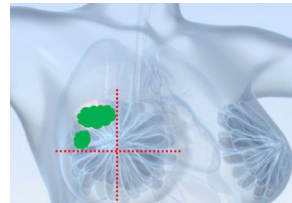
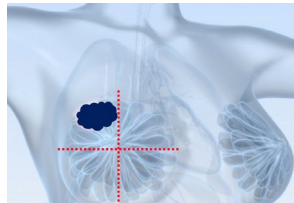
Brusterhaltende Therapie-BET + Radiatio



Bernard Fisher
* 1918 - 2019

NSABP B-04 / NSABP B-06 MILAN-Trial

Veronesi et al NEJM 2002; Fisher et al NEJM 2002



Umberto Veronesi
*1925 - 2016

**Die brusterhaltende
Operation mit
anschließender
Bestrahlung ist eine
sichere Therapiemaßnahme**
(Entfernung im Gesunden)

Der Blick zurück – St Gallen Konsensusempfehlungen 2001

Sentinel

- An **important development** relates to the extensive investigation of axillary staging by SNB, ...
- Controversy** remains about the **routine use of SNB** and the **degree of surgical expertise**
- The **role of immunohistochemistry** and the significance of detected micrometastatic disease in sentinel lymph nodes require further investigation.
- There is **no consensus** about whether **immunohistochemically detected tumor cells** should be regarded as proof for node-positive disease.

Axilläre Lymphknotendisektion (ALND) ohne neoadjuvante Chemotherapie

Empfehlung zur ALND:	Oxford		
	LoE	GR	AGO
▪ Endpunkt: Überleben (bei adäquater, multimodaler Therapie)	3	D	-
▪ Endpunkt: Staging	3	A	-
▪ Endpunkt: Lokoregionale Tumorkontrolle	2a	A	+/-
▪ pN+ (präoperativ histologisch gesichert)	2a	B	+
▪ cN0 pN0 (+) (sn)	1b	A	--
▪ cN0 pN1mi (sn)	1b	A	--
▪ cN0 pN1 (sn) (T1-3, < 3 SN+, BEO + RT + adäquate Systemtherapie)	1b	A	-
▪ cN0 pN1 (sn) und Mastektomie (T1-2, < 3 SN+, keine Radiotherapie der Thoraxwand)	2b	B	+/-
▪ cN0 pN1 (sn) und Mastektomie (T1-3, < 3 SN+, Radiotherapie der Thoraxwand + LAG)	1b	B	-

Sentinel-Lymphknoten-Exzision (SLNE) Indikationen I

	Oxford		
	LoE	GR	AGO
▪ Klinisch / sonographisch neg. Axilla (cN0)	1b	A	++
▪ cT 1-2	1b	A	++
▪ cT 3-4c	3b	B	+
▪ DCIS			
▪ Mastektomie	3b	B	+
▪ BET	3b	B	-
Verzicht auf SLNE:			
▪ postmenopausale Patientin (≥ 50 J., cT1 cN0, BEO + Ganzbrustbestrahlung, HR+/HER2-, G1/G2) analog SOUND/INSEMA	1b	B	+
▪ bei der älteren Patientin (≥ 70 J., cT1/cN0, HR+/HER2-, Mastektomie)	3b	B	+

Aspekte der Axilla-OP - Deeskalation



NACT

- Optimale Methode/Herangehensweise zur Diagnostik
 - MG, US, MRT,...
 - Lokalisation Brust u/o Axilla (prä- und intra-OP)
 - SLN-Tracer
- Deeskalation OP Radikalität (Brust u/o Axilla)
- Risikoreduzierenden Operationen
- Reihenfolge/Deeskalation Radiatio

Rückblick 2024 - Axillasonographie

False-negative AUS

AUS after NACT (n=2200)	ypN0 n (%)	ypN+ n (%)
Not suspicious	1414 (64.3)	786 (35.7)

Significant determinants in multivariate analysis:	OR (95% CI)	false-negative AUS
▪ Breast-pCR (ref. no breast-pCR)	0.13 (0.10-0.16)	10.3%
▪ Tumor subtype (ref. HR+/HER2-)		
HR+/HER2+	0.32 (0.24-0.42)	22.3%
HR-/HER2+	0.24 (0.16-0.37)	11.7%
HR-/HER2-	0.33 (0.24-0.45)	19.8%
▪ Histological grading (ref. 1)		
2	0.51 (0.21-1.20)	
3	0.31 (0.13-0.71)	26.5%

False-positive AUS

AUS after NACT (n=1060)	ypN0 n (%)	ypN+ n (%)
Suspicious	379 (35.8)	681 (64.2)

Significant determinants in multivariate analysis:	OR (95% CI)	false-positive AUS
▪ Breast-pCR (ref. no breast-pCR)	11.47 (7.90-16.91)	78.6%
▪ Tumor subtype (ref. HR+/HER2-)		
HR+/HER2+	3.94 (2.64-5.88)	56.3%
HR-/HER2+	5.32 (2.91-9.97)	76.7%
HR-/HER2-	2.68 (1.75-4.09)	46.5%

AXSANA/EUBREAST-03 /AGO-B-053

-
- ACT study.

- ### Clip

Probe-guided

Magnetic seed: 225
Radar marker: 102
Radioactive seed: 16
RFID: 10
Other: 2



Carbon ink



Combination

Clip + carbon: 16
Clip + magseed: 7
Magseed + carbon: 5
Clip + radar marker: 3
Clip + radioact. seed: 1
Clip + carbon +
radioact. seed: 1

Comparison of marking techniques for target lymph nodes in 2,596 patients with node-positive breast cancer treated with neoadjuvant chemotherapy: Results from the prospective multicenter AXSANA / EUBREAST-03 / AGO-B-053 study (NCT04373655)

Maggie Banyas-Paluchowski, Steffi Hartmann, Nina Ditsch, Janna de Bontface, Ornella Cavide Gentilini, Roger Stiehlens, Gudrun Karandich, Michael Hauptmann, Marc Thiel, Rosa D. Miccio, Marius Hahn, David Muraica, Barbara Ferec, Thibault Di Pietro, Michelle Kontny, Laura Ninkovic, Maria Luiza Gasparri, Heidemarie Lina Rebaza, Florian Gubaix & AXSANA Study Group

2025 ASCO® ANNUAL MEETING #ASCO25 PRESENTED BY: Prof. Dr. M. ...
Therapeutics is property of the author.

TLN detection rate differed significantly according to the marker used ($p = 0.004$) and was highest in case of probe-guided techniques (96.6%), followed by carbon (94.9%), and clip (89.6%)

Marking technique pre-NACT	Number of pts.	Number of removed nodes	TLN detection rate
		during TAD/TLNB Mean $\pm$ SD	
Clip	1,594	2.95 $\pm$ 1.90	89.6%
Carbon ink	118	2.99 $\pm$ 1.73	94.9%
Total probe-guided detection markers	355	2.81 $\pm$ 1.73	96.6%
Magnetic seed	225	2.77 $\pm$ 1.64	96.9%
Radar marker	102	3.10 $\pm$ 2.01	96.1%
Radioactive seed	16	1.88 $\pm$ 0.72	100%
RFID	10	2.40 $\pm$ 1.08	90%
Other	2	2.00 $\pm$ 0.00	100%
Combination	33	2.76 $\pm$ 1.42	93.9%
Total	2,100	2.92 $\pm$ 1.86	91.2%

Vorgehen axilläres Staging nach NACT – AGO 2025

Axilläre operative Interventionen bei NACT (cN0)

							Oxford		
							LoE	GR	AGO
cN-Status (vor NACT)	pN-Status (vor NACT)	ycN-Status (nach NACT)	Axilläre operative Intervention (nach NACT)	AGO	ypN-Status (nach NACT und Operation)	Operative Konsequenz aus Histobefund			
cN0	Keine OP vor NACT	ycN0	SLNE	++	ypN0 (sn)	Keine	2b	B	++
					ypN0 (i+) (sn)	ALND	2b	B	-
					ypN1mi (sn)	ALND	2b	C	+/-
					ypN1 (sn)	ALND	2b	C	++

Axilläre operative Interventionen bei NACT (cN+)

							Oxford		
							LoE	GR	AGO
cN-Status (vor NACT)	pN-Status (vor NACT)	ycN-Status (nach NACT)	Axilläre operative Intervention (nach NACT)	AGO	ypN-Status (nach NACT und Operation)	Operative Konsequenz aus Histobefund			
cN+*	pN+ ^{cN0}	ycN0	ALND	+	ypN0 / ypN+	Keine	2b	B	++
			TAD	+	ypN0	Keine	2b	B	+
					ypN0 (i+)	ALND	2b	B	-
					ypN1mi	ALND	2b	B	+/-
					ypN+	ALND	2b	B	+
			SLNE	+/-	ypN0	Keine	2b	B	+/-
					ypN0 (i+)	ALND	2b	B	+/-
					ypN+ inkl. ypN1mi	ALND	2b	B	+
			TLNE	+/-	ypN0	ALND	2b	B	+/-
					ypN0 (i+)	ALND	3b	B	+/-
					ypN+ inkl. ypN1mi	ALND	3b	B	+
		ycN+**	ALND	+	ypN0 / ypN+	Keine	2b	B	++

Targeted Axillary Dissection (TAD) = TLNE + SLNE



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in der DGK e.V.
Guidelines Breast
Version 2025.1D

In Zusammen-
arbeit mit:



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FORSCHEN
LEBEN
HEILEN

- Stanzbiopsische Sicherung der LK-Metastase und Markierung
- Markierung von mehreren Lymphknoten bei mehr als 1 suspekten LK
- Evidenz für den Vergleich einzelner Marker (Clip / Coil, Kohle, magnetischer Seed, Radar-Reflexion, Radiofrequenzmarker etc.) nicht ausreichend*
- TAD bei 1-3 suspekten LK vor NACT
- TAD bei ≥ 4 suspekten LK vor NACT
- Vollständige Aufarbeitung aller Lymphknoten am Paraffinschnitt mit Schnittstufen von ≤ 500 µm
 - Immunhistochemie zum Nachweis von ITC
- ALND bei prä- oder intraoperativ nicht auffindbarem Marker
 - Weitere Intervention zur Entfernung des nicht auffindbaren Markers (auch nach ALND)
- Alleinige TLNE ohne SLNE

* Studienbeteiligung an AXSANA empfohlen.

Oxford			
LoE	GR	AGO	
2b	B	++	
2b	B	+/-	
2b	B	+	
2b	B	+	
5	D	+/-	
5	D	++	
2b	D	-	
5	D	+	
5	D	-	
2B	B	+/-	



Tumor bed biopsy for prediction of pCR after NACT

Study	TP (n)	FP (n)	FN (n)	TN (n)	FNR (%)	IR (%)	Sensitivity	Specificity
Basik et al. [12]	18	0	18	65	5.6%	98.2%	94.4% (34 / (34 + 2))	94.8% (73/(73 + 4))

- Pooled sensitivity 0.58 (95% CI 0.51–0.65)
- Pooled specificity 1.00 (95% CI 0.99–1.00)
- pooled false-negative rate was 42% (95% CI 35–49%)

While tumor bed biopsy may help identify residual disease, **its current diagnostic performance does not support its use as a standalone tool for surgical de-escalation**, underscoring the need for further refinement and prospective validation before clinical adoption

******Authors did tumor bed biopsy of all post-NACT patients, Heil et al. included partial response patients as well

*******Koelbel et al.: Uncertain histology of tumor bed were taken as false positive, Kilic et al.: hypothesized that minimal residual tumor might have been taken out during biopsy

Eliminating breast surgery for invasive breast cancer in exceptional responders to neoadjuvant systemic therapy: a multicentre, single-arm, phase 2 trial

Henry M Kuerer, Benjamin D Smith, Savitri Krishnamurthy, Wei T Yang, Vicente Valero, Yu Shen, Heather Lin, Anthony Lucci, Judy C Boughey, Richard L White, Emilia J Diego, Gaiane M Rauch, on behalf of the Exceptional Responders Clinical Trials Group*

- TNBC od. HER2 +
- cT1/2; cN0/1 (<4)
- NACT
- 12 VSB (9G) Clippr

pCR*

Radiatio

40 Gy in 15 fractions or 50 Gy in 25 fractions
plus a mandatory boost (14 Gy in seven fractions)

standard therapy

efficacy and safety analyses

Breast surgery:

- 37% no residual
- 63% residual

MD Anderson Expansion cohort
(NCT02945579; cohort C)

South Korean OPTIMIST trial
(NCT05505357-KBCSG-24)

Kuerer et al. Lancet Oncol 2022

in follow-up 26.4 mo
no ipsilateral recurrences
no other recurrence events or
deaths were observed

Kuerer et al. Jama Oncol 2022

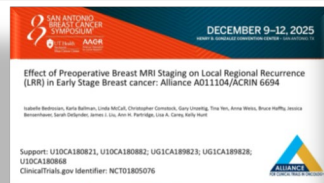
in follow-up 55.4 mo
no ipsilateral recurrences
no other recurrence events or
deaths were observed

*falls bei ED cN+, dann TAD Axilla erforderlich

Der Blick zurück – St Gallen Konsensusempfehlungen 2005

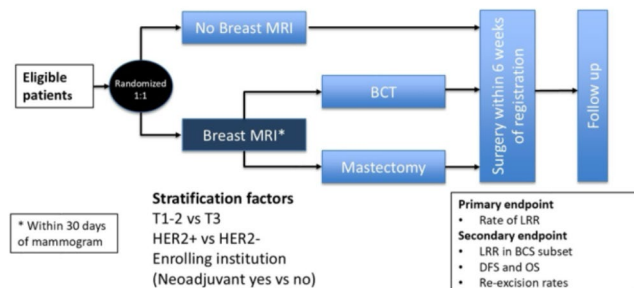
2005

- Exclusion of multifocal disease by MRI may improve selection for conservative surgery.



Bedrosian et al SABCS2025

Study Design: A randomized, multi-center phase III trial



Breast MRI for surgical planning does not result in improved locoregional control
No indication of benefit to breast MRI based on age and tumor subtype

S3-LL Mammakarzinom 2025

Empfehlungsgrad B Evidenzlevel 2	Bei der Abklärung auffälliger Befunde sollte die Kontrastmittel-MRT auf diejenigen Fälle eingegrenzt werden , die mit konventioneller Diagnostik (MG, US) sowie perkutaner Biopsie nicht ausreichend sicher gelöst werden können
Empfehlungsgrad B Evidenzlevel 2	Die ergänzende Kontrastmittel-MRT, alternativ Kontrastmittel-Mammographie, sollte bei gesichertem Malignom dort prätherapeutisch durchgeführt werden, wo mit konventioneller Bildgebung eine eingeschränkte Beurteilbarkeit der Befund-ausbreitung zu erwarten ist, z.B. invasiv-lobuläres Mammakarzinom, V.a. Multifokalität/-zentrität, sehr dichtes Drüsengewebe etc. Die Indikation hierzu sollte in einer multidisziplinären Konferenz gestellt werden.
EK	Bei Multifokalität/-zentrität und geplanter brusterhaltender Operation sollte ein Kontrastmittel-MRT erfolgen.
EK	Eine Kontrastmittel-MRT der Mamma oder Kontrastmittel-Mammographie soll nur dort erfolgen , wo die Möglichkeit einer MRT-gestützten oder Kontrastmittel-Mammographie-gestützten Intervention vorhanden bzw. verbindlich geregelt ist und die histologischen Ergebnisse der Intervention in einer multidisziplinären Konfe-renz im Sinne der Dokumentation der Ergebnisqualität vorgestellt werden.

Der Blick zurück – St Gallen Konsensusempfehlungen 2009

- The **definition of adequate surgical margins remains controversial** with a majority of **North American** radiation oncologists **willing to accept a margin as negative if the tumour does not extend to the inked specimen surface, while surgeons and European radiation oncologists prefer a clearance of 2–5 mm in addition to this.**

4.45	Evidenzbasiertes Statement	geprüft 2025
ST	Der Resektionsrandstatus hat einen prognostischen Effekt beim invasiven Mammakarzinom. Es besteht ein signifikanter Zusammenhang zwischen dem Resektionsrandstatus (positiv vs. negativ) und der Lokalrezidivrate.	
Evidenzlevel 1	Daher wird bei allen intrinsischen Subtypen, auch bei begleitendem DCIS, die Resektion als ausreichend erachtet, wenn am Schnittrand kein Tumorgewebe nachweisbar ist („no tumor on ink“). Eine Nachresektion ist daher bei einer R0-Resektion auch bei knappen freien Schnitt-grenzen nicht indiziert. Bei extensiver intraduktaler Komponente kann ggf. ein größerer Sicherheitsabstand sinnvoll sein (siehe Kapitel 4.2 DCIS).	

Brusterhaltende Operation (BEO) Resektionsränder			
	Oxford		
	LoE	GR	AGO
■ Invasives Mammakarzinom ohne extensive intraduktale Komponente (EIC)*			
▪ Ziel: tumorfreie Resektionsränder (auch bei ungünstiger Biologie ist "no ink on tumor" ausreichend)	2a	A	++
▪ Nachresektion bei invasivem oder in situ Tumorausläufer bis in den Resektionsrand (Paraffinschnitt)	2a	B	++
■ Invasives Mammakarzinom mit EIC*			
▪ Nachresektion bei invasivem oder in situ Tumorausläufer bis in den Resektionsrand (Paraffinschnitt)	2a	B	++
▪ Nachresektion bei knappem Resektionsrand der intraduktalen Komponente (< 2 mm im Paraffinschnitt)**	2a	B	-
* Keine einheitliche Definition der EIC in der Literatur. Da die EIC das Lokalrezidivrisiko erhöht, wenn die Größe der intraduktalen Komponente in einer Dimension mindestens das Doppelte der Größe der invasiven Komponente beträgt, wird die Verwendung dieser Definition entsprechend der S3-Leitlinie empfohlen.			
** Individuelles Vorgehen mit Berücksichtigung des Alters und der Tumorausdehnung.			

Der Blick zurück – St Gallen Konsensusempfehlungen 2009

- Lobular carcinoma in situ (LCIS) at the margin is not regarded as an indication for reexcision.



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Strategy after Diagnosis of LIN / LCIS

	Oxford		
	LoE	GR	AGO
LIN / LCIS in core- / vacuum-assisted biopsy: - No further measures if LIN (LCIS, classical variant) with involvement of ≤ 3 TDLU (terminal ductulo-lobular unit) in vacuum biopsy and concordant with imaging. - Open excisional biopsy, with pleomorphic LIN / LCIS, florid LIN / LCIS, or LIN / LCIS with comedo type necrosis or if not concordant with imaging findings.	2b	C	++
LIN / LCIS at margins of resection specimen (BCT): No further surgery.	2a	C	++

Exceptions:

- Pleomorphic, florid, or LIN / LCIS with necrosis
- Imaging abnormality is not removed

Der Blick zurück – St Gallen Konsensusempfehlungen 2015

2013 multicentric disease:

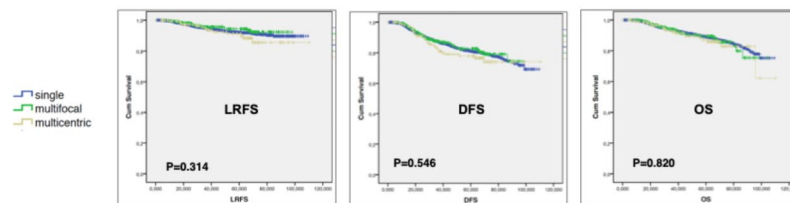
relative contraindication to breast-conserving therapy

2015

Breast conservation after neoadjuvant chemotherapy is **feasible** even when the disease is multicentric, provided that the margins are free of disease [96].

Überleben nach BET bei MF/MC nach neoadjuvanter Chemotherapie

Überleben	Unifokal (n= 3217)	Multifokal (n= 454)	Multizentrisch (n=163)	p-Wert
3-J-Lokalrezidivfreies Überleben (LRFS)	94.3%	95.8%	92.0%	p=0.314
3-J-Krankheitsfreies Überleben (DFS)	85.6%	86.8%	81.6%	p=0.546
3-J-Gesamtüberleben (OS)	91.5%	91.9%	89.0%	p=0.820



Ataseven et al Ann Surg Oncol 2015

[96] Ataseven B, Lederer B, Blohmer JU et al. Impact of Multifocal or Multicentric Disease on Surgery and Locoregional, Distant and Overall Survival of 6,134 Breast Cancer Patients Treated With Neoadjuvant Chemotherapy. Ann Surg Oncol 2015; 22: 1118-27.

Der Blick zurück – St Gallen Konsensusempfehlungen 2015

2013 multicentric disease:

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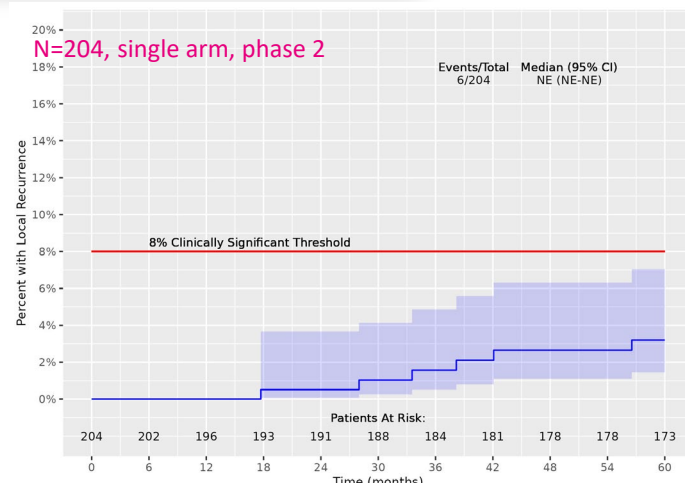
2023

The ACOSOG Z11102 trial demonstrated the safety of breast-conserving surgery and radiation for patients with multiple ipsilateral breast cancers



Inclusion Criteria

- Women age ≥ 40
- 2 or 3 foci of breast cancer
- At least one foci of invasive disease
- ≥ 2 cm normal tissue between lesions
- No more than 2 quadrants with disease
- cN0 or cN1 disease



3.1%
(95% CI: 1.3 - 6.4)

CAVE:

LR war höher

- Präop kein MRT (22,6 % vs. 1,7%, p=0.002)
- Keine adj endokrine Therapie (12.5% vs 1.9%)

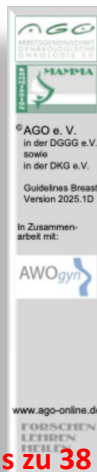
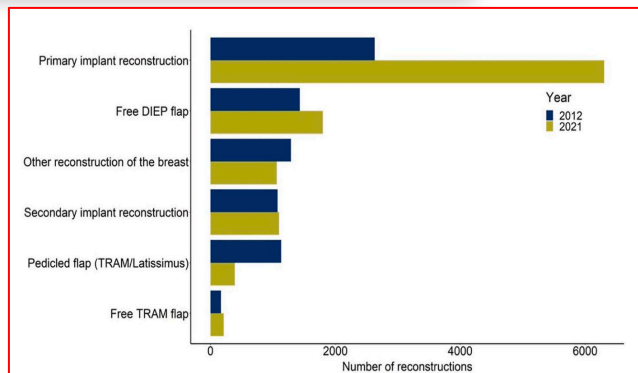
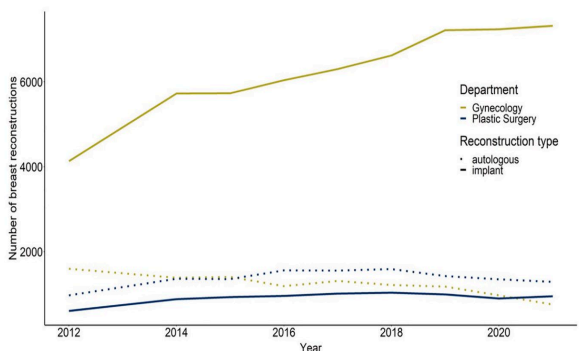
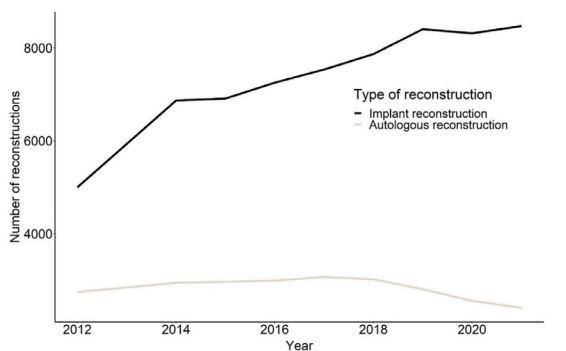
Der Blick zurück – St Gallen Konsensusempfehlungen 2001

Sofortrekonstruktion

Goldhirsch et al. JCO 2001

Surgery for primary invasive breast cancer include **increasing acceptance of immediate reconstruction in cases where mastectomy is required.**

2012 bis 2021: Brustrekonstruktionsrate nach Mastektomie auf bis zu 38 % angestiegen
Zahl implantatbasierter Rekonstruktionen um fast 70 % angestiegen



Zeitpunkt der Rekonstruktion

	Oxford		
	LoE	GR	AGO
▪ Sofortrekonstruktion			
▪ Vermeiden des Postmastektomie-Syndroms	3b	B	++
▪ Spätrekonstruktion (zweizeitig)			
▪ Keine Verzögerung von adjuvanten Therapien (CTx, RT)	3b	B	++
▪ Nachteil: Verlust des Hautmantels			
▪ Verzögerte Rekonstruktion (Platzhalter vor definitiver Rekonstruktion) („Delayed-immediate reconstruction“)	3b	B	+

Der Blick zurück – St Gallen Konsensusempfehlungen 2005

2005

- Conservation of the nipple-areola complex during mastectomy, with immediate breast reconstruction, while well accepted by patients, **requires careful patient selection and patient information on limited long-term experience.**

4.52	Evidenzbasierte Empfehlung	geprüft 2025
Empfehlungsgrad 0	Unter Berücksichtigung von tumorfreien Resektionsrändern kann die Mastektomie auch hautsparend mit oder ohne Erhalt des Mamillen-Areola-Komplexes (MAK) durchgeführt werden.	
Evidenzlevel 2	[492] , [493] , [494] , [495]	
	Starker Konsens	

Ann Surg Oncol (2021) 28:4284–4291
<https://doi.org/10.1245/s10434-020-09427-0>

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY



ORIGINAL ARTICLE – BREAST ONCOLOGY

Oncologic Safety of Nipple-Sparing Mastectomy in Patients with Breast Cancer and Tumor-to-Nipple Distance ≤ 1 cm: A Matched Cohort Study

Zhen-Yu Wu, MD, PhD^{1,2}, Hee Jeong Kim, MD, Jisun Kim, MD, PhD², Sae-Byul Lee, MD, PhD², Hyun Ho Han, MD, PhD³, Jin-Sup Eom, MD, P Gyungyub Gong, MD, PhD³, Hak Hee Kim, MD, PhD³

Ann Surg Oncol (2023) 30:8381–8388
<https://doi.org/10.1245/s10434-023-14143-6>

ORIGINAL ARTICLE – BREAST ONCOLOGY

Spare the Nipple: A Systematic Review of Tumor Nipple-Distance and Oncologic Outcomes in Nipple-Sparing Mastectomy

Susie Youn, MD¹, Es and Nikoo Rajaei, MD

TABLE 3 Summary of case series of nipple-sparing mastectomies including tumors < 2 cm from the nipple

Study	Country	Journal	n (total or subgroup)	Pathology	Exclusion criteria	Mean tumor-to-nipple distance (mm)	LRR (all patients, %)	# of patients with TND < 2 cm (n)
Burdette et al. ¹⁶	USA	Annals of Surgical Oncology	39 (subgroup)	IBC, DCIS	No direct nipple involvement	Mean 25.3 $\pm$ 14.8	4 (10.3%)	Not reported
Chan et al. ²⁰	Hong Kong	World Journal of Surgery	97 (total)	IBC, DCIS	No direct nipple involvement	Mean 20.6 (1–70)	4 (4.1%)	Not reported
De Alcantara et al. ⁷	USA	Annals of Surgical Oncology	157 (subgroup)	IBC, DCIS	1 cm	10.4 (0–109)	0 (0%)	Not reported
Dent et al. ¹⁷	USA	Plastic and Reconstructive Surgery	195 (total)	IBC, DCIS	No direct nipple involvement	10.6 months ^a	9 (4.6%)	112 on MRI, 103 on ultrasound
Fortunato et al. ¹⁸	Italy	Journal of Surgical Oncology	121 (total)	IBC, DCIS	1 cm	25 (range not reported)	1 (0.8%)	31 tumors 1 cm from NAC
Jun et al. ¹⁹	South Korea	Clinical Breast Cancer	30 (subgroup)	IBC, DCIS	No direct nipple involvement	47 (5–72)	0 (0%)	19
Krivoski et al. ²⁰	USA	Annals of Surgical Oncology	218 (subgroup)	IBC, DCIS	No direct nipple involvement	19 (1–66)	5 (1.7%)	26
Mesdag et al. ²¹	France	Journal of Gynecology and Obstetrics	63 (subgroup)	IBC, DCIS	No direct nipple involvement	42 (18–58)	1 (1.6%)	10
Papke et al. ²²	Germany	Annals of Surgical Oncology	96 (total)	IBC, DCIS	No direct nipple involvement	34 (20–54)	2	Not reported
Polid et al. ⁸	USA	Annals of Surgical Oncology	412 (subgroup)	IBC, DCIS	No direct nipple involvement	28 (3–116)	8 (2%)	Not reported
Porok et al. ²⁰	USA	American Journal of Surgery	105 (subgroup)	IBC, DCIS	No direct nipple involvement	25.8 ($\pm$ 18)	4 (3.1%)	5
Orkunt et al. ²³	Turkey	Balkan Medical Journal	14 (subgroup)	IBC, DCIS	No direct nipple involvement	64 (31–114)	0 (0%)	13
Sacchini et al. ²³	USA	Journal of American College of Surgeons	68 (subgroup)	IBC, DCIS	1 cm	24.5 (4.7–71.9)	2 (3.1%)	11
Santoro et al. ²⁴	Italy	The Breast	186 (total)	IBC, DCIS	1 cm	35 (range not reported)	3 (1.6%)	Not reported
Shino et al. ²⁵	Japan	Breast Cancer	425 (total)	IBC, DCIS	No direct nipple involvement	46.8 (6–158)	25 (5.8%)	Not reported
Tang et al. ⁷	USA	Journal of American College of Surgeons	642 (subgroup)	IBC, DCIS	No direct nipple involvement	36 (6–79)	9 (1.4%)	Not reported
Valero et al. ²⁶	USA	Annals of Surgical Oncology	449 (total)	IBC, DCIS	1 cm	39.4 (0.4–150)	4 (0.6%)	Not reported
Yamashita et al. ²⁷	Japan	Clinical Breast Cancer	190 (subgroup)	IBC, DCIS	1 cm	71 (10–131)	11 (5.8%)	48

TND tumor-nipple distance, LRR locoregional recurrence, IBC invasive breast cancer, DCIS ductal carcinoma in situ

^aFollow-up reported as mean ($\pm$ SD) or (range)

Der Blick zurück – St Gallen Konsensusempfehlungen 2009

- The **use of contralateral prophylactic mastectomy is clearly increasing in several series** though the rationale remains unclear, and evidence that this procedure improves survival is lacking.*

4.53	Evidenzbasierte Empfehlung	geprüft 2025
Empfehlungsgrad B	Eine kontralaterale risiko-reduzierend Mastektomie sollte bei Nicht-Mutationsträgerinnen bzw. bei Patientinnen ohne Nachweis einer familiären Hochrisikosituation zur Reduktion des kontralateralen Mammakarzinomrisikos nicht durchgeführt werden.	
Evidenzlevel 2	[449] , [200] , [233] , [496] , [224]	
	Konsens	

*diese Arbeit war im Zusammenhang mit DCIS
GBG 23. ANNUAL SCIENTIFIC MEETING

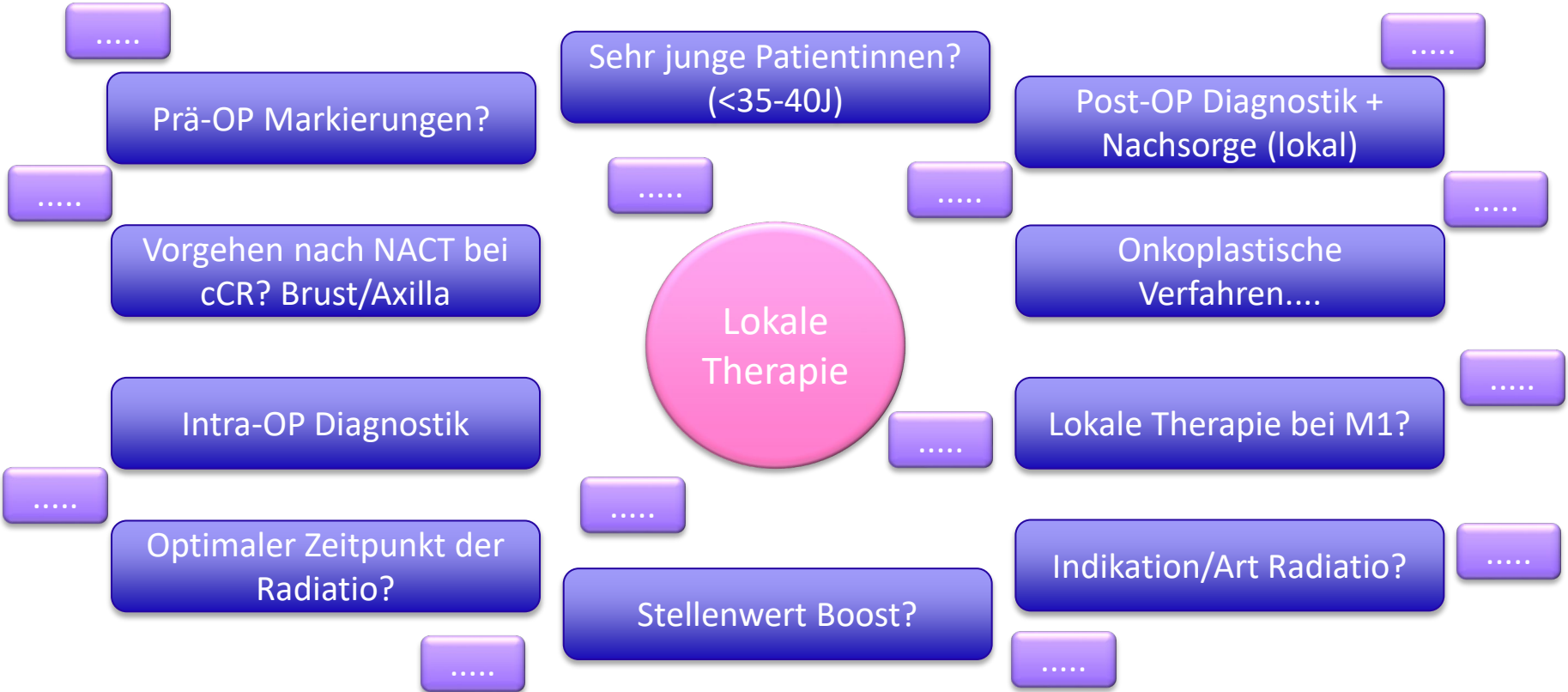
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Goldhirsch et al. AnnOncol 2009

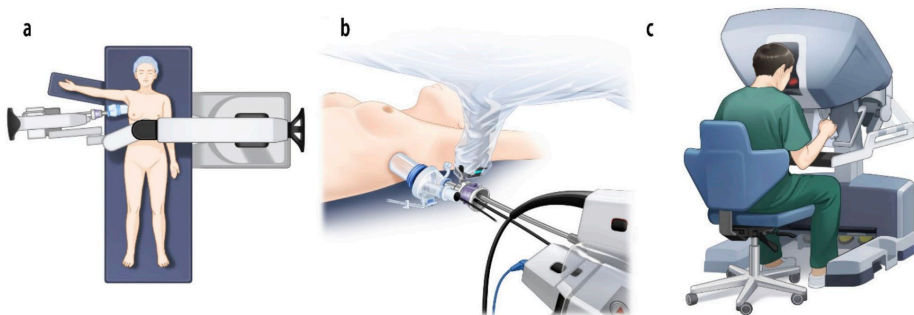
Sind noch Fragen offen?



Die Zukunft?

Use of the Da Vinci SP surgical system in robot-assisted nipple-sparing mastectomy: a single-center, retrospective study

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Lee et al. | <https://doi.org/10.1038/s41598-024-84807-0>

Variables	N = 60
Duration of surgery: NSM performed by breast surgeon, median (IQR, min)	154.0 (130.5–206.0)
Duration of unilateral surgery, median (IQR, min)	150.5 (122.8–181.0)
Duration of bilateral surgery, median (IQR, min)	209.0 (198.0–238.0)
Robotic procedure time, median (IQR, min)	30.0 (20.0–40.0)
Duration of surgery: reconstruction performed by plastic surgeon, median (IQR, min)	133.0 (80.0–255.0)
Duration of unilateral surgery, median (IQR, min)	113.0 (77.0–231.0)
Duration of bilateral surgery, median (IQR, min)	301.5 (243.5–376.8)
Estimated blood loss, median (mL) ^a	< 10
Intraoperative transfusion	0 (0%)
Conversion to alternative methods	0 (0%)
Intraoperative adverse events	0 (0%)

Variables	N = 60
Number of patients admitted to ICU	1 (1.7%)
Days to drain removal, median (IQR, postoperative day)	5.0 (4.0–6.0)
Duration (days) of postoperative hospital stay, median (IQR, postoperative day)	5.5 (3.0–9.0)
Unplanned procedure-related reoperations within 1-month postoperative ^a	3 (5.0%)
Unplanned procedure-related readmissions within 1-month postoperative	0 (0%)

Variables	N = 66
Location of the incision ^a	
Mid or anterior axillary	66 (100%)
Immediate breast reconstruction ^a	
One stage	65 (98.5%)
Two stage	1 (1.5%)
Implant	38 (57.6%)
DIEP	26 (39.4%)
LD flap	2 (3.0%)
Drainage number (average, IQR)	3.1 (2.0–6.0)
Using gas ^a	
Yes	57 (86.2%)
No	9 (13.8%)
Sentinel node biopsy ^a	66 (100%)
Axillary lymph node dissection ^a	12 (18.2%)

Single-Port Robot-Assisted Nipple-Sparing Mastectomy: Main Analysis of a Retrospective Multicenter Study (SPROUT, KoREa-BSG 09)

- 2018-2023
- 428 patients
- 12 institutions in Korea
- mean breast surgeon's operative time: 160.5 ± 54.1 min
- plastic surgeon's operative time: 167.1 ± 116.1 min
- total operative time: 333.5 ± 132.6 min

Reconstruction method

Tissue expander	18 (4.2)
Direct to implant	283 (66.1)
TRAM/DIEP flap	119 (27.8)
LD flap	5 (1.2)
Others	3 (0.7)

Table 3 Surgical complications

Complication	Stats
Complication	
No complication	346 (80.8)
Seroma	27 (6.3)
Bleeding/hematoma	18 (4.2)
Skin necrosis	9 (2.1)
Infection	6 (1.4)
Nipple ischemia	6 (1.4)
Nipple necrosis	5 (1.2)
Skin ischemia	3 (0.7)
Wound dehiscence	2 (0.5)
Autologous flap failure	1 (0.2)
Implant loss	1 (0.2)
Thermal injury	1 (0.2)
Others	3 (0.7)
Clavien_Dindo	
0	346 (80.8)
I	28 (6.5)
II	9 (2.1)
IIIa	32 (7.5)
IIIb	13 (3.0)
Second operation	
No	416 (97.2)
Yes	12 (2.8)

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Original Article



Consensus Statement on Robotic Nipple Sparing Mastectomy Expert Panel

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50 Training and learning curve assessment For fully independent breast surgeons, more than 20 cases experiences of robotic mastectomy experience is
51 considered an expert and therefore proctor other surgeons.
52 For fully independent breast surgeons, 1–5 cases observation is considered adequate before embarking on the first
53 case.
For fully independent breast surgeons, 1–5 cases proctorship is considered adequate before embarking on the first
case.
A cadaveric workshop is highly recommended prior to performing the first case.

Heilung durch Innovation, Kompetenz
und Partnerschaft – führend in der
Brustkrebs-Forschung

Vielen Dank

