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Diagnostik und Therapie früher und fortgeschrittener Mammakarzinome

Onkoplastische und rekonstruktive Mammachirurgie



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Plastisch-rekonstruktive Aspekte nach Mastektomie

- **Versionen 2002–2018:**
Audretsch / Bauerfeind / Blohmer / Brunnert / Dall /
Ditsch / Fersis / Gerber / Hanf / Kümmel / Lux / Nitz /
Rezai / Rody / Scharl / Solbach / Thomssen /
- **Version 2019:**
Kümmel / Friedrich

Pubmed 2003 - 2017

Cochrane data base (z.B. Cochrane Breast Cancer Specialised Register)

Suchbegriffe: breast reconstruction; ... AND random allocation, ... AND cohort study

Einteilung in EBM-Grade nach

Jeremy Howick, et al. "The 2011 Oxford CEBM Evidence Levels of Evidence (Introductory Document)". Oxford Centre for Evidence-Based Medicine. <http://www.cebm.net/index.aspx?o=5653>

Verwendete Guidelines zu Diagnostik und Therapie des Mammakarzinoms

National Institute of Health (NIH) – National Cancer Institute:


<http://www.cancer.gov/cancertopics/pdq/treatment/breast/HealthProfessional/>

American Association of Clinical Oncology (ASCO) and Technology Assessments: <http://www.asco.org/portal/site/ASCO/menuitem>.
(Practice Guidelines),


Canadian Medical Association (CMA): <http://www.cmaj.ca/cgi/content/full/158/3/DC1>

NCCN 2016

Regeln zur Überarbeitung der AGO Empfehlungsdias_Stand 01/ 2019

 <p>© AGO e. V. in der DGGG e.V. sowie in der DKG e.V.</p> <p>Guidelines Breast Version 2019.1D</p> <p>www.ago-online.de</p> <p>FORSCHEN LEHREN HEILEN</p>	<h2 style="text-align: center;">Definition der onkoplastischen Operation</h2> <p>Einsatz plastischer operativer Techniken zum Zeitpunkt der Tumorentfernung, um sichere Resektionsgrenzen zu erreichen und eine ästhetische Brustform zu ermöglichen.</p> <p>Fokus auf günstige Narbenplatzierung, adäquate Weichteilformierung, Wahl des geeigneten Wiederaufbauverfahrens (auch unter der Bedingung einer Radiatio) und Rekonstruktion der Gegenseite, um eine Symmetrie zu erreichen.</p>
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1. Oncoplastic breast surgery: comprehensive review. Bertozzi N, et al. 2017; 21(11): 2572-2585.
2. Optimizing breast cancer adjuvant radiation and integration of breast and reconstructive surgery. Kuerer H, et al. ASCO Educational Book 2017



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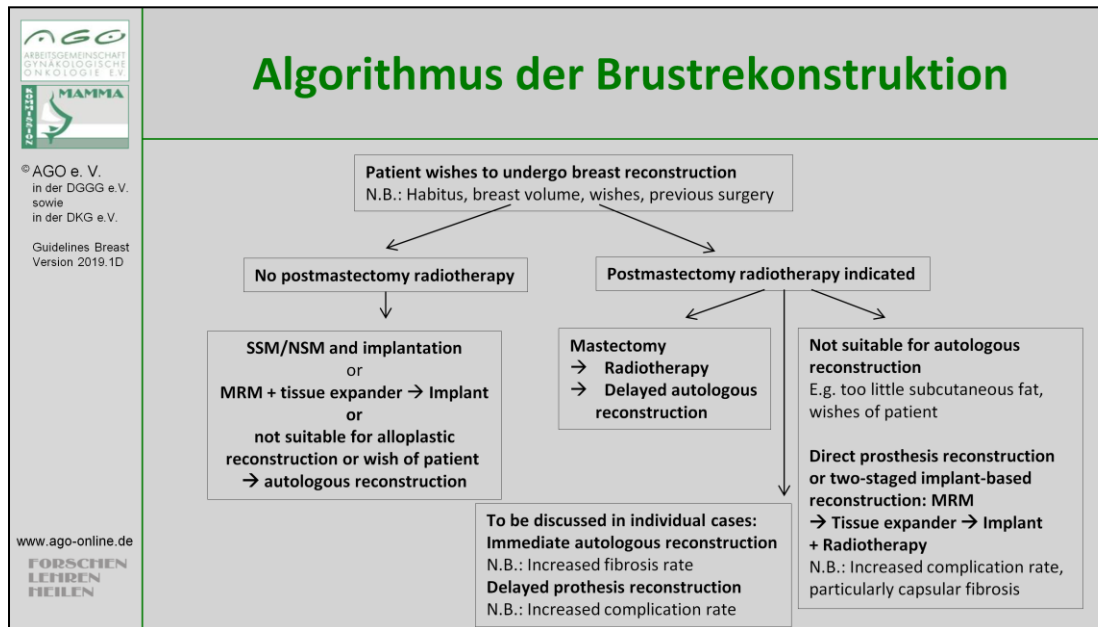
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Onkoplastische brusterhaltende Operation


	Oxford		
	LoE	GR	AGO
▪ Tumoradaptierte Reduktionsplastik	2a	B	+
▪ Lokale Lappen-/Verschiebetechniken	2a	B	+
▪ Partielle Mastektomie mit Gewebetransfer	3b	B	+/-
▪ Onkologische Sicherheit gegeben	2a	B	

1. Determinants for patient satisfaction regarding aesthetic outcome and skin sensitivity after breast-conserving surgery. Dahlbäck C, et al. World J Surg Oncol. 2016; 14(1):303.
2. Oncoplastic surgery combining abdominal advancement flaps with volume displacement techniques to breast-conserving surgery for small- to medium-sized breasts. Ogawa T, et al. Breast Cancer. 2016; 23(6):932-938.
3. The role of oncoplastic breast conserving treatment for locally advanced breast tumors. A matching case-control study. Vieira RA, et al. Ann Med Surg (Lond). 2016; 10:61-8.
4. Complications of Oncoplastic Breast Surgery Involving Soft Tissue Transfer Versus Breast-Conserving Surgery: An Analysis of the NSQIP Database. Cil TD, et al. Ann Surg Oncol. 2016; 23(10):3266-71.
5. Comparative study of oncoplastic versus non-oncoplastic breast conserving surgery in a group of 211 breast cancer patients. Cali Cassi L, et al. Eur Rev Med Pharmacol Sci. 2016; 20(14):2950-4.
6. Operative and Oncologic Outcomes in 9861 Patients with Operable Breast Cancer: Single-Institution Analysis of Breast Conservation with Oncoplastic Reconstruction. Carter SA, et al. Ann Surg Oncol. 2016; 23(10):3190-8.
7. Outcomes After Oncoplastic Breast-Conserving Surgery in Breast Cancer Patients: A Systematic Literature Review. De La Cruz L, et al. Ann Surg Oncol. 2016; 23(10):3247-58.

8. Oncoplastic breast conserving surgery and oncological outcome: Systematic review. Yiannakopoulou EC, et al. 2016; 42(5):625-30.
9. Oncoplastic reduction mammoplasty for breast cancer in women with macromastia: Oncological long-term outcomes. Emiroglu M, et al. Asian J Surg. 2017; 40(1):41-47.



1. Radiation and breast reconstruction: Algorithmic approach and evidence-based outcomes. El-Sabawi B, et al. J Surg Oncol. 2016; 113(8):906-12.
2. Breast Reconstruction Following Cancer Treatment. Gerber B, et al. Dtsch Arztebl Int. 2015; 112(35-36):593-600
3. Optimizing breast cancer adjuvant radiation and integration of breast and reconstructive surgery. Kuerer H, et al. ASCO Educational Book 2017; Memorial Sloan Kettering Cancer Center, Fig. 2 und 3
4. What is the optimum timing of postmastectomy radiotherapy in two-stage prosthetic reconstruction: radiation to the tissue expander or permanent implant? Cordeiro PG, et al. Plast Reconstr Surg. 2015



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Brustrekonstruktion

Grundsätze

AGO: ++

- **Planung der Rekonstruktion im interdisziplinären Tumorboard vor einer Mastektomie**
- **Beratung hinsichtlich aller OP-Techniken, sowie deren Vor- und Nachteile**
- **Möglichkeit zum Einholen einer Zweitmeinung**
- **Besprechung einer neoadjuvanten Systemtherapie bei ungünstiger Tumor-Brust-Relation**
- **Berücksichtigung der kontralateralen Brust;**
 - mögliche Angleichung-/Folge-OPs zur Symmetrieherstellung besprechen; i.d.R. sekundär nach Abstand von mindestens 3-6 Monate (Cave: Notwendigkeit Nachresektionen, Effekte der Radiotherapie der betroffenen Seite berücksichtigen)
- **Bevorzugung einer die Patientin wenig belastenden OP-Technik mit langfristig stabilem ästhetischen Ergebnis (BET gegenüber Mastektomie zu präferieren)**
- **Cave: keine Verzögerung in der adjuvanten Therapie durch die Rekonstruktion**

1. AWMF Leitlinien: S3-LL. Brustrekonstruktion mit Eigengewebe. Registernummer 015 – 075, Stand: 01.04.2015 , gültig bis 31.03.2020
2. Oncoplastic breast surgery: comprehensive review. Bertozzi N, et al. Eur Rev Med Pharmacol Sci. 2017; 21(11):2572-2585.
3. Oncologic safety of nipple-sparing mastectomy in women with breast cancer. Smith BL, et al. J Am Coll Surg
4. Nipple-sparing mastectomy and direct to implant breast reconstruction. Colwell AS, et al. Plast Reconstr Surg. 2017; 140(5S Advances in Breast Reconstruction):44S-50S.
5. Impact of Breast Reconstruction on Time to Definitive Surgical Treatment, Adjuvant Therapy, and Breast Cancer Outcomes. Brice Jabo, Ann C. Lin, Mayada A. Aljehani et al.: [Ann Surg Oncol](#). 2018 Oct;25(10):3096-3105.



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Möglichkeiten der Rekonstruktion nach Mastektomie

Oxford			
LoE	GR	AGO	
Einsatz von mit Silikongel gefüllten Implantaten einzeitig (primär) oder zweizeitig nach Expander	2a	B	+
▪ Sicherheit vergleichbar mit Kochsalzimplantaten	2b	B	
Autologer Gewebettransfer	2a	B	+
Gestielter Gewebettransfer	2a	B	+
Freier Gewebettransfer (mit Gefäßanastomosen)	2a	B	+
Autologer Gewebettransfer kombiniert mit Implantaten	3a	C	+

Cave: BMI > 30, Raucher, Diabetes, Strahlentherapie, Alter, bilaterales ME

1. Complications in Postmastectomy Breast Reconstruction: One-year Outcomes of the Mastectomy Reconstruction Outcomes Consortium (MROC) Study. Wilkins EG, et al. Ann Surg. 2016 [Epub ahead of print]
2. Comparison of subcutaneous versus submuscular expander placement in the first stage of immediate breast reconstruction. Zhu L, et al. J Plast Reconstr Aesthet Surg. 2016; 69(4):e77-86.
3. Five-Year Safety Data for More than 55,000 Subjects following Breast Implantation: Comparison of Rare Adverse Event Rates with Silicone Implants versus National Norms and Saline Implants. Singh N, et al. Plast Reconstr Surg. 2017; 140(4):666-679.
4. Short-term safety outcomes of mastectomy and immediate implant-based breast reconstruction with and without mesh (iBRA): a multicentre, prospective cohort study. Shelley Potter, Elizabeth J Conroy, Ramsey I Cutress, Paula R Williamson et al.: [Lancet Oncol.](#) 2019 Jan 9. pii: S1470-2045(18)30781-2.



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Zeitpunkt der Rekonstruktion

	Oxford LoE	GR	AGO
Sofortrekonstruktion <ul style="list-style-type: none"> Obligat bei SSM/NSM Vermeiden des Postmastektomie-Syndroms 	3b	B	++
Intervallrekonstruktion <ul style="list-style-type: none"> Keine Behinderung von adjuvanten Therapien (CHT, RT) Nachteil: Verlust des Hautmantels 	3b	B	++
Verzögerte Sofortrekonstruktion („Delayed-immediate BR“)	3b	B	+/-

1. Complications After Mastectomy and Immediate Breast Reconstruction for Breast Cancer: A Claims-Based Analysis. Jaggi R, et al. Ann Surg. 2016; 263(2):219-27.
2. What Is the Optimum Timing of Postmastectomy Radiotherapy in Two-Stage Prosthetic Reconstruction: Radiation to the Tissue Expander or Permanent Implant? Maione L, et al. Plast Reconstr Surg. 2016; 138(1):150e-1e.
3. Comparison of Delayed and Immediate Tissue Expander Breast Reconstruction in the Setting of Postmastectomy Radiation Therapy. Ribuffo D, et al. Ann Plast Surg. 2016; 76(6):743-4.
4. Impact of bilateral versus unilateral mastectomy on short term outcomes and adjuvant therapy, 2003–2010: a report from the National Cancer Data Base. Sharpe SM, et al. Ann Surg Oncol. 2014; 21:2920–7.
5. A Comparison of Surgical Complications Between Immediate Breast Reconstruction and Mastectomy: The Impact on Delivery of Chemotherapy-An Analysis of 391 Procedures. Zhong T, et al. Ann Surg Oncol. 2012; 19(2):560-6.
6. Immediate versus delayed reconstruction following surgery for breast cancer. D'Souza N, et al. Cochrane Database Syst Rev. 2011; (7):CD008674.
7. Direct to implant versus two stage tissue expander/implant reconstruction: 2 year risks and patient reported outcomes from a prospective, multicenter study. Srinivasa DR, et al. Plast Reconstr Surg. 2017; 140(5):869-877.

8. Quality of life and patient satisfaction after one-stage implant-based breast reconstruction with an acellular dermal matrix versus two-stage breast reconstruction (BRIOS): primary outcome of a randomised, controlled trial. Vera Lidwina Negenborn, Danny Aschwin Young-Afat, Rieky Elise Gustina Dikmans et al: [Lancet Oncol.](#) 2018 Sep;19(9):1205-1214.



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Zeitpunkt der Rekonstruktion mit Implantaten in Bezug zur Strahlentherapie

	Oxford		
	LoE	GR	AGO
■ Implantat-Rekonstruktion (IR)			
■ IR ohne Strahlentherapie (RT)	2a	B	+
■ IR vor RT	2a	B	++
■ IR nach RT	2a	B	+
■ IR nach sekundärer Mastektomie nach BET	2b	B	+/-
■ IR nach sekundärer Mastektomie nach BET	2a	B	+/-
■ Perioperativ verlängerte antibiotische Prophylaxe (mind. 24 Stunden)	2b	B	+

1. Postmastectomy Radiation Therapy and Two-Stage Implant-Based Breast Reconstruction: Is There a Better Time to Irradiate? Santosa KB, et al. Plast Reconstr Surg. 2016; 138(4):761-9.
2. What Is the Optimum Timing of Postmastectomy Radiotherapy in Two-Stage Prosthetic Reconstruction: Radiation to the Tissue Expander or Permanent Implant? Maione L, et al. Plast Reconstr Surg. 2016; 138(1):150e-1e.
3. Radiation and breast reconstruction: Algorithmic approach and evidence-based outcomes. El-Sabawi B, et al. J Surg Oncol. 2016; 113(8):906-12.
4. Antibiotic Prophylaxis following Implant-Based Breast Reconstruction: What Is the Evidence? Phillips BT, Halvorson EG. Plast Reconstr Surg. 2016; 138(4):751-7.
5. Discussion: Antibiotic Prophylaxis following Implant-Based Breast Reconstruction: What Is the Evidence? Hunter JG. Plast Reconstr Surg. 2016; 138(4):758-9.
6. Are Prophylactic Postoperative Antibiotics Necessary for Immediate Breast Reconstruction? Results of a Prospective Randomized Clinical Trial. Phillips BT, et al. J Am Coll Surg. 2016; 222(6):1116-24.
7. Prosthetic breast reconstruction in previously irradiated breasts: A meta-analysis. Lee KT, Mun GH. J Surg Oncol. 2015; 112(5):468-75.

8. A single pre-operative antibiotic dose is as effective as continued antibiotic prophylaxis in implant-based breast reconstruction: A matched cohort study. Townley WA, et al. *J Plast Reconstr Aesthet Surg*. 2015; 68(5):673-8.
9. Implant breast reconstruction and radiation: a multicenter analysis of long-term health-related quality of life and satisfaction. Albornoz CR, et al. *Ann Surg Oncol*. 2014; 21(7):2159-64.
10. Acellular dermal matrices and radiotherapy in breast reconstruction: a systematic review and meta-analysis of the literature. Valdatta L, et al. *Plast Surg Int*. 2014; 472604.
11. A systematic review of morbidity associated with autologous breast reconstruction before and after exposure to radiotherapy: are current practices ideal? Kelley BP, et al. *Ann Surg Oncol*. 2014; 21(5):1732-8.
12. Reconstruction: before or after postmastectomy radiotherapy? A systematic review of the literature. Berbers J, et al. *Eur J Cancer*. 2014; 50(16):2752-62.
13. Radiotherapy in implant-based immediate breast reconstruction: risk factors, surgical outcomes, and patient-reported outcome measures in a large Swedish multicenter cohort. Eriksson M, et al. *Breast Cancer Res Treat*. 2013; 142(3):591-601.
14. Delayed autologous breast reconstruction after postmastectomy radiation therapy: is there an optimal time? Momoh AO, et al. *Ann Plast Surg*. 2012; 69(1):14-8.
15. Extended trimethoprim/sulfamethoxazole prophylaxis for implant reconstruction in the previously irradiated chest wall. Mirzabeigi MN, et al. *Plast Reconstr Surg*. 2012; 129(1):1e-7e.
16. Radiotherapy and breast reconstruction: a meta-analysis. Barry M, Kell MR. *Breast Cancer Res Treat*. 2011; 127(1):15-22.
17. Determining the outcomes of post-mastectomy radiation therapy delivered to the definitive implant in patients undergoing one- and two-stage implant-based breast reconstruction: A systematic review and meta-analysis. Magill LJ, et al. *J Plast Reconstr Aesthet Surg*. 2017; 70(10):1329-1335.
18. Impact of Radiotherapy on Complications and Patient-Reported Outcomes After Breast Reconstruction. Jaggi R, et al. *J Natl Cancer Inst*. 2018; 110(2).



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Radiotherapie und Implantatrekonstruktion

**Cave: Hohe Komplikationsrate in Kombination mit
Radiotherapie (Kapselkontraktur,
Revisionsoperationen, Versagen der Rekonstruktion,
reduzierte Kosmetik und Patientenzufriedenheit)**

**Cave: Niedrigere Patientenzufriedenheit bei
Implantatrekonstruktion plus Radiotherapie im
Vergleich zur autologen Rekonstruktion plus
Radiotherapie**

LoE 2b B

1. Determining the outcomes of post-mastectomy radiation therapy delivered to the definitive implant in patients undergoing one- and two-stage implant-based breast reconstruction: A systematic review and meta-analysis. Magill LJ, et al. J Plast Reconstr Aesthet Surg. 2017; 70(10):1329-1335.
2. Impact of Radiotherapy on Complications and Patient-Reported Outcomes After Breast Reconstruction. Jagsi R, et al. J Natl Cancer Inst. 2018; 110(2).
3. Impact of Postmastectomy Radiation Therapy in Prepectoral Versus Subpectoral Implant-Based Breast Reconstruction. Catherine J. Sinnott, Sarah M. Persing, Mary Pronovost et al.: [Ann Surg Oncol](#). 2018 Oct;25(10):2899-2908.



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Possible Associations between Implants and rare Diseases

- **US FDA Breast Implant Postapproval Studies (LPAS)**
Long-term Outcomes in 99,993 Patients
(Primary Augmentation: N= 71.937 / Primary Reconstruction: N= 9942)
 - 56% of implants were silicone implants
- **Possible Associations:**
 - Sjogren syndrome: (SIR*8.14)
 - scleroderma: (SIR 7.00)
 - rheumatoid arthritis: (SIR5.96)
 - stillbirth: (SIR4.50)
 - melanoma: (SIR3.71)
- **At 7 years, reoperation rate is 11.7% for primary augmentation, and 25% for primary/revision reconstruction.**
- **One case of BI-ALCL**

Associations need to be further analyzed with
patient-level data to provide conclusive evidence !

*Standardized incidence ratio

New Background slide

Statistical Analysis:

LPAS data is expressed relative to normative population rates using standardized incidence ratios (SIRs)

Systemic harm rates in the study population are calculated per 10,000 person-years.

Normative population rates for systemic harms, self-harm, and reproductive outcomes are obtained from the literature; rates reflect LPAS demographics for female sex, age, and race in the United States.

1. [Coroneos CJ](#)¹, [Selber JC](#), [Offodile AC](#) **2nd** et al.: US FDA Breast Implant Postapproval Studies: Long-term Outcomes in 99,993 Patients. [Ann Surg.](#) 2019 Jan;269(1):30-36.



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New Background slide

1. [Coroneos CJ](#), [Selber JC](#), [Offodile AC 2nd](#) et al.: US FDA Breast Implant Postapproval Studies: Long-term Outcomes in 99,993 Patients. [Ann Surg](#). 2019 Jan;269(1):30–36.



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Techniken / Netze im Rahmen der Rekonstruktion

Oxford		
LoE	GR	AGO
3b	C	+
2a	B	+ [#]
2b	B	+ [#]

- **Eigengewebe (z.B. deepithelialisierter Corium-Fett-Lappen, TDAP[§], LDF*)**
- **Azelluläre Dermis (ADM)**
- **Synthetische Netze**


§ Thorakodorsaler Arterien Perforator-Lappen

* Latissimus dorsi Lappen

Teilnahme an Registerstudien empfohlen

1. The scarless latissimus dorsi flap for full muscle coverage in device-based immediate breast reconstruction: an autologous alternative to acellular dermal matrix. Elliott LF, et al. Plast Reconstr Surg. 2011; 128(1):71-9
2. Long-term outcomes following fat grafting in prosthetic breast reconstruction: a comparative analysis. Seth AK, et al. Plast Reconstr Surg. 2012; 130(5):984-9.
3. Focus on technique: one-stage implant-based breast reconstruction. Salzberg CA. Plast Reconstr Surg. 2012; 130(5 Suppl 2):95S-103S.
4. Mesh versus acellular dermal matrix in immediate implant-based breast reconstruction - A prospective randomized trial. Gschwantler-Kaulich D, et al. Eur J Surg Oncol. 2016; 42(5):665-71.
5. Single-stage breast reconstruction using Strattice™: A retrospective study. Dikmans RE, et al. J Plast Reconstr Aesthet Surg. 2016; 69(2):227-33.
6. Subcutaneous Implant-based Breast Reconstruction with Acellular Dermal Matrix/Mesh: A Systematic Review. Salibian AA, et al. Plast Reconstr Surg Glob Open. 2016; 4(11):e1139.
7. Clinical outcome and patient satisfaction with the use of bovine-derived acellular dermal matrix (SurgiMend™) in implant based immediate reconstruction following skin sparing mastectomy: A prospective observational study in a single centre. Headon H, et

- al. Surg Oncol. 2016; 25(2):104-10.
8. Biological and synthetic mesh use in breast reconstructive surgery: a literature review. Logan Ellis H, et al. World J Surg Oncol. 2016; 14:121.
 9. Subcutaneous Tissue Expander Placement with Synthetic Titanium-Coated Mesh in Breast Reconstruction: Long-term Results. Casella D, et al. Plast Reconstr Surg Glob Open. 2016; 3(12):e577.
 10. Risk-reducing, conservative mastectomy-analysis of surgical outcome and quality of life in 272 implant-based reconstructions using TiLoop(®) Bra versus autologous corial flaps. Rezai M, et al. Gland Surg. 2016; 5(1):1-8.
 11. Acellular Dermal Matrix in Immediate Expander/Implant Breast Reconstruction: A Multicenter Assessment of Risks and Benefits. Sorkin M, et al. Plast Reconstr Surg. 2017; 140(6):1091-1100.
 12. A Meta-analysis of Studies Comparing Outcomes of Diverse Acellular Dermal Matrices for Implant-Based Breast Reconstruction. Lee KT, Mun GH. Ann Plast Surg. 2017; 79(1):115-123.
 13. Thoracodorsal artery perforator flap as an autologous alternative to acellular dermal matrix. Hashem T, Farahat A. World J Surg Oncol. 2017; 15(1):185.
 14. Is single-stage implant-based breast reconstruction (SSBR) with an acellular matrix safe?: Strattice™ or Meso Biomatrix® in SSBR. Hillberg NS, Ferdinandus PI1, Dikmans REG et al.: Eur J Plast Surg. 2018;41(4):429-438. doi: 10.1007/s00238-018-1415-2. Epub 2018 Apr 24.



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Lipotransfer

	Oxford		
	LoE	GR	AGO
▪ Lipotransfer nach ME und Rekonstruktion	2a	B	+
▪ Lipotransfer nach brusterhaltender Therapie	2a	B	+
▪ Mit Stammzellen (ACS) angereicherte, autologe Fettgewebstransplantation	4	C	-

1. AWMF-Leitlinie „Autologe Fetttransplantation“, Klasse: S2k Registernummer: 009/017, 11/2015
2. Autologous fat transplantation for breast reconstruction: A literature review. Simonacci F, et al. Ann Med Surg (Lond). 2016; 12:94-100.
3. Systematic review: The oncological safety of adipose fat transfer after breast cancer surgery. Waked K, et al. Breast. 2016; 31:128-136.
4. Breast cancer and fat grafting: efficacy, safety and complications-a systematic review. De Decker M, et al. Eur J Obstet Gynecol Reprod Biol. 2016; 207:100-108.
5. Lipofilling of the Breast Does Not Increase the Risk of Recurrence of Breast Cancer: A Matched Controlled Study. Petit JY, Maisonneuve P. Plast Reconstr Surg. 2016; 138(5):937e-938e.
6. Oncological Safety of Lipofilling in Patients with Breast Cancer: A Meta-analysis and Update on Clinical Practice. Wazir U, et al. Anticancer Res. 2016; 36(9):4521-8.
7. Lipofilling of the Breast Does Not Increase the Risk of Recurrence of Breast Cancer: A Matched Controlled Study. Batista BN, et al. Plast Reconstr Surg. 2016; 138(6):1068e-1069e.
8. Oncological outcomes of lipofilling breast reconstruction: 195 consecutive cases and literature review. Silva-Vergara C, et al. J Plast

- Reconstr Aesthet Surg. 2016; 69(4):475-81.
9. Lipofilling of the Breast Does Not Increase the Risk of Recurrence of Breast Cancer: A Matched Controlled Study. Kronowitz SJ, et al. Plast Reconstr Surg. 2016; 137(2):385-93.
 10. Efficacy and Safety of Cell-Assisted Lipotransfer: A Systematic Review and Meta-Analysis. Zhou Y, et al. Plast Reconstr Surg. 2016; 137(1):44e-57e.
 11. The Safety, Effectiveness, and Efficiency of Autologous Fat Grafting in Breast Surgery. Spear SL, et al. Plast Reconstr Surg Glob Open. 2016; 4(8):e827.
 12. Autologous fat grafting in onco-plastic breast reconstruction: A systematic review on oncological and radiological safety, complications, volume retention and patient/surgeon satisfaction. Groen JW, et al. J Plast Reconstr Aesthet Surg. 2016; 69(6):742-64.
 13. Indications and Controversies in Lipofilling for Partial Breast Reconstruction. Delay E, Guerid S, Meruta AC. Clin Plast Surg. 2018 Jan;45(1):101-110. doi: 10.1016/j.cps.2017.08.008. Epub 2017 Sep 18.
 14. Adipose-Derived Stem Cells in Novel Approaches to Breast Reconstruction: Their Suitability for Tissue Engineering and Oncological Safety. O'Halloran N, et al. Breast Cancer (Auckl). 2017; 11:1178223417726777.
 15. Lipofilling effects after breast cancer surgery in post-radiation patients: an analysis of results and algorithm proposal. Debald M, et al. Eur J Plast Surg. 2017; 40(5):447-454.
 16. Determining the Oncologic Safety of Autologous Fat Grafting as a Reconstructive Modality: An Institutional Review of Breast Cancer Recurrence Rates and Surgical Outcomes. Cohen O, et al. Plast Reconstr Surg. 2017; 140(3):382e-392e.
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Gestielte Lappen zur Rekonstruktion


Brustrekonstruktion (BR) mit autologem Gewebe

- **TRAM, Latissimus-dorsi-Lappen** (können muskel-sparend präpariert werden)
 - **Delayed-TRAM** bei Risikopatientinnen
 - **Ipsilateral gestielter TRAM**
 - **Radiotherapie:**
 - BR nach RT
 - BR vor RT
- (erhöhte Rate an Fibrosen, Wundheilungsstörungen, Lipoidnekrosen, reduziertes ästhetisches Outcome)

Oxford		
LoE	GR	AGO
3b	C	+
3a	B	+
3b	A	+
2a	B	+
2a	B	+/-

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Freie Lappen zur Rekonstruktion

Oxford		
LoE	GR	AGO
2a	B	+
2a	B	+
3a	C	+/-
4	C	+/-
4	C	+/-

Freier Gewebetransfer

- DIEP
- Freier TRAM
- SIEA
- Gluteallappen (SGAP- / IGAP, FCI)
- Free gracilis flap (TMG)

Vorteil

- Freier TRAM und DIEP sind potenziell muskelsparend; DIEP hat niedrige Rate an Hernien.

Nachteile

- Zeit- und personalintensive mikrochirurgische Techniken
- Aufwendige postoperative Überwachung
- Höhere Rate an Reoperationen
- RT vor Rekonstruktion erhöht Rate vaskulärer Komplikationen

1. Effects of Obesity on Postoperative Complications After Breast Reconstruction Using Free Muscle-Sparing Transverse Rectus Abdominis Myocutaneous, Deep Inferior Epigastric Perforator, and Superficial Inferior Epigastric Artery Flap: A Systematic Review and Meta-analysis. Lee KT, Mun GH. Ann Plast Surg. 2016; 76(5):576-84.
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Gestielter vs. freier Gewebetransfer

- Muskelsparende Techniken und sorgfältiger Verschluss der Bauchdecke führen zu niedrigen Komplikationsraten unabhängig von der verwendeten Methode
- Autologer Gewebetransfer von der Bauchdecke hat die höchste Zufriedenheitsrate in allen Patientengruppen
- Morbidität der Spenderregion (z.B. reduzierte Muskelfunktion) kann bei allen Lappentechniken auftreten

Oxford		
LoE	GR	AGO
3a	A	++

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Lappen-Implantat-Kombination

LDF* + Implantat

- Nach RT
- Vor RT

Weitere Lappentechniken + Implantat

Vorteile:

- TRAM: bevorzugt Implantateinlage nach Intervall
- Verbesserte Abdeckung des Implantates
- Geeignet zur Rekonstruktion bestrahlten Gewebes

Nachteil:

- Muskelkontraktion (LDF)

* LDF = Latissimus dorsi flap


Oxford		
LoE	GR	AGO
2b	C	+
3b	C	+
5	D	-
5	C	+/-

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* ICG = Indocyanine Green

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Risiko-reduzierende bilaterale Mastektomie für nicht erkrankte Frauen (RRBM)

	Oxford		
	LoE	GR	AGO
▪ RRBM verringert die Brustkrebsinzidenz	1b	A	++
▪ RRBM bei BRCA1/2 Mutationsträgerinnen	2a	B	+*
▪ RRBM bei hohem Mammakarzinomrisiko (individuelle Entscheidung in Abhängigkeit von Mutationsstatus und familiärer Belastung – z.B. high-risk/moderate Gene/Hodgkin-Lymphom)	4	D	+/-*
▪ Hohes Risiko und keine Beratung in spezialisierten Zentren*	5	D	--
▪ Nicht direktive Beratung vor RRBM	2b	B	++*
▪ RRBM sollte im Zusammenhang mit anderen Risiko-reduzierenden Op. wie BSO und vorbestehenden Erkrankungen gesehen werden	2a	A	++*
▪ Weitere Notwendigkeit der Fortbildung von Ärztinnen und Ärzten in Bezug auf Möglichkeiten und Vorteile der RRBM	1b	A	++

* Beratung, Risikoberechnung und Nachsorge in spezialisierten Zentren empfohlen

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Chirurgische Prävention bei gesunden **BRCA1/2 Mutationsträgerinnen**


	Oxford LoE	GR	AGO
■ Risiko-reduzierende bilaterale Salpingo-Oophorektomie (RRSO) <ul style="list-style-type: none"> ■ reduziert die Brustkrebsinzidenz und –mortalität ■ reduziert die Eierstockkrebsinzidenz und -mortalität ■ reduziert die Gesamtmortalität 	2c	B	* +/-* ++* ++*
■ Risiko-reduzierende bilaterale Mastektomie (RRM) <ul style="list-style-type: none"> ■ Reduziert die Brustkrebsinzidenz 	2a	B	+*

Die RRSO wird nach Abschluss der Familienplanung empfohlen.
Die Ablate nach RRM zeigen eine erhöhte Rate an prämaligen Läsionen.

* Studienteilnahme empfohlen

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Formen der Risiko-reduzierenden (bilateralen) Mastektomie (RRBM)

Oxford

LoE	GR	AGO
-----	----	-----

RRBM reduziert die Inzidenz von MaCa und wahrscheinlich auch MaCa-bedingte Mortalität**

▪ Einfache Mastektomie	2b	B	+
▪ RRBM mittels SSM*	2b	C	+
▪ RRBM mittels NSM* (MAK# erhaltend)	2b	C	+
▪ Kontralaterale prophylaktische Mastektomie	4	C	+/-

* SSM / NSM: Skin-/Nipple-Sparing Mastectomy
 # MAK: Mamillen-Areola-Komplex
 ** in Abhängigkeit von Vorerkrankungen, z.B. bei vorbestehendem Ovarialkarzinom 1-2%

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