



Treatment of Breast Cancer

INTRABEAM 600 from ZEISS



Localized tumor control, gentle and precise – targeted effectiveness for breast cancer treatments

In recent years, a new approach has been gaining ground in the treatment of breast cancer. Radical surgical methods are being replaced by less-invasive, breast-conserving therapy. Such a trend is now also appearing in radiotherapy. Radiation oncologists are moving away from the current, largely standardized treatment plan to risk-adapted, tailored radiation therapy because intraoperative radiation therapy (IORT) offers key benefits for breast cancer patients.

- With IORT the tumor bed is irradiated; this is the area where the risk of recurrence is highest immediately after R0 resection.¹
- Depending on your patient, radiation can be delivered as a single, targeted treatment during surgery or as a boost treatment in combination with conventional EBRT.²
- IORT avoids the risk of temporal and geographic miss.³
- IORT can also be used in settings where oncoplastic techniques are performed.⁴
- IORT has better cosmetic outcomes.^{5,6,7}
- IORT offers selected patients the possibility of a second breast-conserving treatment.^{8,9}
- IORT leads to better quality of life and patient convenience compared to EBRT.¹⁰



1 The position of the tumor is determined.



2 During surgery a minimally invasive access point is created.



3 The tumor is surgically removed.



4 The correct size (\emptyset) of the applicator is determined and the applicator is positioned in the tumor bed.



5 The tumor bed is locally irradiated for about 30 minutes.



6 The applicator is removed and the incision closed.



The targeted, intraoperative dose of radiation with IORT from ZEISS is on its way to becoming a standard treatment for breast cancer. This risk-adapted therapeutic solution makes it possible for a patient cohort with a favorable prognosis to complete surgery and irradiation in a single session or as irradiation of the tumor bed (boost) in combination with postoperative external beam radiation therapy (EBRT). Traditional radiotherapy, including the stress of protracted treatment regimes, is eliminated for these patients. In situations in which definitive irradiation cannot be performed, such as local recurrence, the TARGIT dose of radiation also provides an opportunity for a second attempt at breast-conserving therapy.^{8,9}



The clinical rationale

Unlike traditional irradiation, IORT from ZEISS can be adapted to the needs of the patient: For selected patients with a low risk profile the standard 3-6 weeks of post-op irradiation can either be reduced or completely eliminated.¹⁰ In radiotherapy the tumor bed is frequently missed due to postoperative changes or oncoplastic reconstruction. Even with modern-day imaging techniques the exact position of the tumor cavity is difficult to localize, but targeted irradiation avoids collateral tissue damage.³ Targeted breast cancer treatment with IORT from ZEISS achieved excellent results compared to all other IORT modalities. TARGIT-A is the largest multicenter randomized clinical trial in the field of partial breast irradiation. 3,451 patients aged 45 and older were randomized in 33 centers from 11 countries between 2000 and 2012. The results were non-inferior in the TARGIT arm compared to standard treatment. Toxicity and mortality were lower, especially for non-breast-cancer-related deaths compared to EBRT.¹¹



Adapt the radiation to the needs of your patients

To irradiate the tumor bed, e.g. in breast-conserving treatment for breast cancer patients, ZEISS offers a complete range of applicators in different shapes, sizes and diameters. This versatility enables the physician to exactly adapt the emitted radiation beam to the form and size of the tumor bed.

Literature References

- 1 Vaidya, J. S., Joseph, D. J., Tobias, J. S., Bulsara, M., Wenz, F., Saunders, C., ... Baum, M. (2010). Targeted intraoperative radiotherapy versus whole breast radiotherapy for breast cancer (TARGIT-A trial): an international, prospective, randomised, non-inferiority phase 3 trial. *The Lancet*, 376(9735), 91–102.
- 2 Williams, N. R., Pigott, K. H., Brew-Graves, C., & Keshtgar, M. R. S. (2014). Intraoperative radiotherapy for breast cancer. *Gland Surgery*, 3(2), 109–119.
- 3 Benda, R. K., Yasuda, G., Sethi, A., Gabram, S. G. A., Hinerman, R. W., & Mendenhall, N. P. (2003). Breast boost: Are we missing the target? A dosimetric comparison of two boost techniques. *Cancer*, 97(4), 905–909.
- 4 Malter, W., Kirn, V., Richters, L., Fridrich, C., Markiefka, B., Bongartz, R., ... Kraemer, S. (2014). Intraoperative Boost Radiotherapy during Targeted Oncoplastic Breast Surgery: Overview and Single Center Experiences. *International Journal of Breast Cancer*, 1–6.
- 5 Keshtgar, M. R. S., Williams, N. R., Bulsara, M., Saunders, C., Flyger, H., Cardoso, J. S., ... Joseph, D. J. (2013). Objective assessment of cosmetic outcome after targeted intraoperative radiotherapy in breast cancer: results from a randomised controlled trial. *Breast Cancer Research and Treatment*, 140(3), 519–525.
- 6 Corica, T., Nowak, A. K., Saunders, C. M., Bulsara, M., Taylor, M., Vaidya, J. S., ... Joseph, D. J. (2016). Cosmesis and breast-related quality of life outcomes following intra-operative radiotherapy for early breast cancer - a sub-study of the TARGIT-A trial. *International Journal of Radiation Oncology*Biolog*Physics*.
- 7 Grobmyer, S. R., Lightsey, J. L., Bryant, C. M., Shaw, C., Yeung, A., Bhandare, N., ... Copeland, E. M. (2013). Low-kilovoltage, single-dose intraoperative radiation therapy for breast cancer: Results and impact on a multidisciplinary breast cancer program. *Journal of the American College of Surgeons*, 216(4), 617–624.
- 8 Kraus-Tiefenbacher, U., Bauer, L., Scheda, A., Schoeber, C., Schaefer, J., Steil, V., & Wenz, F. (2007). Intraoperative radiotherapy (IORT) is an option for patients with localized breast recurrences after previous external-beam radiotherapy. *BMC Cancer*, 7(1), 178.
- 9 Keshtgar, M. R. S., Vaidya, J. S., Tobias, J. S., Wenz, F., Joseph, D., Stacey, C., ... Baum, M. (2011). Targeted Intraoperative Radiotherapy for Breast Cancer in Patients in Whom External Beam Radiation Is Not Possible. *International Journal of Radiation Oncology*Biolog*Physics*, 80(1), 31–38.
- 10 Welzel, G., Boch, A., Sperk, E., Hofmann, F., Kraus-Tiefenbacher, U., Gerhardt, A., ... Wenz, F. (2013). Radiation-related quality of life parameters after targeted intra-operative radiotherapy versus whole breast radiotherapy in patients with breast cancer: results from the randomized phase III trial TARGIT-A. *Radiation Oncology*, 8(1), 9.
- 11 Vaidya, J. S., Wenz, F., Bulsara, M., Tobias, J. S., Joseph, D. J., Keshtgar, M., ... Baum, M. (2014). Risk-adapted targeted intraoperative radiotherapy versus whole-breast radiotherapy for breast cancer: 5-year results for local control and overall survival from the TARGIT-A randomised trial. *The Lancet*, 383(9917), 603–613.



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 **Carl Zeiss Meditec AG**
Goeschwitzer Strasse 51–52
07745 Jena
Germany
www.zeiss.com/radiotherapy
www.zeiss.com/med/contacts

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