

Intraoperative radiotherapy of the breast - really a valide option or “only” comfortable

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Submitted Mar 02, 2013. Accepted for publication Apr 01, 2013.

doi: 10.3978/j.issn.2227-684X.2013.04.01

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Intraoperative radiotherapy (IORT) of the breast is an innovative treatment option for early breast cancer and has rapidly entered clinical practice in the last years. There are several indications using a breast IORT. Generally accepted because of excellent long-term results is the intraoperative tumorbed boost followed by an external whole breast irradiation (WBI) (1,2). Considering that most in-breast tumor recurrences are seen in or near to the initial tumor site (3-7) partial breast irradiation (PBI) as the sole radiotherapy treatment modality is of large interest. Different PBI techniques, such as an IORT with electrons or 50 kV X-rays (Intrabeam[®]), the interstitial multicatheter or balloncatheter (Mammosite[®]) brachytherapy or also the 3D conformal external beam radiotherapy are in clinical use [overview in (8,9)], whereby no superiority could be shown for one of them.

However, up to now no data of randomized clinical trials with an adequate follow-up comparing the PBI with the standard WBI are available. First results of the TARGIT-trial, published by Vaidya *et al.*, reporting an equal local relapse rate using either WBI or IORT *et al.* seems to be promising (10). But because of the short follow-up of 24.6 months the data must be interpreted as preliminary. Definitively, a valid statement concerning the local tumor control after PBI can at earliest given after a follow-up of 10 years, especially because of the more subsequent appearances of recurrences elsewhere in the breast compared to tumorbed recurrences (11,12).

One of the most frequently mentioned arguments preferring the breast IORT is the shortening of the total radiation treatment time by one to two weeks performing an IORT boost or to one day performing a PBI contributing

to the patient comfort. Among this the assessment of radiation-related quality-of-life (QoL) aspects plays an important role. Welzel *et al.* (13) evaluated this issue based on a single-center subgroup of 87 patients enrolled into the randomized trial TARGIT-A (10). Furthermore, the results were compared to two control groups outside the TARGIT-A trial.

The patients of the TARGIT-A trial treated with IORT alone had significantly fewer breast symptoms and a trend to less general pain and arm symptoms compared to patients receiving IORT and WBI. Furthermore, patients treated with IORT alone showed a significantly better radiation-related QoL than those treated with external beam radiotherapy as assessed by restrictions in daily activities, general pain, breast and arm symptoms. No relevant differences could be observed between TARGIT-patients receiving IORT and EBRT and (non-randomized) patients receiving an IORT-boost or percutaneous boost.

One main limitation of the study was mentioned by the authors themselves. The data were collected based on patients participating in a randomized trial but the analysis itself was performed cross-sectional designed. Therefore, the results do not allow conclusions regarding causality but they can strongly advert to aspects associated with self-reported QoL. Another problem is, analogously to the tumor control data published by Vaidya *et al.* (10), the short follow-up of 32 months. It is known, that the development of side effects associated with breast irradiation like fibrosis is an ongoing process and continues beyond 3 years (14-16).

It should be noted that, because of the different physical characteristics and especially the minor dose homogeneity of the Intrabeam-system (17) the data are only applicable to

the Linac-based IORT with electrons of limited extend.

Concluding, comparing different treatment techniques for breast irradiation the “IORT alone” approach seems to be superior according to QoL aspects. The data published by Welzel *et al.* are very interesting and will enforce the discussion around the PBI.

Acknowledgements

Disclosure: The author declares no conflict of interest.

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Cite this article as: Piroth MD. Intraoperative radiotherapy of the breast - really a valide option or “only” comfortable. *Gland Surg* 2013;2(2):114-115. doi: 10.3978/j.issn.2227-684X.2013.04.01