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Local breast cancer treatment with targeted oncoplastic breast surgery

Stefan Kraemer, Mahdi Rezai, Wolfram Malter and Michael Friedrich*

Breast Center, Deptartment Gynaecology and Obstetrics, HELIOS Medical Center Krefeld, Lutherplatz 40, 47805 Krefeld, Germany

Abstract

Oncoplastic surgery was introduced into breast-conserving surgery 15 years ago to allow oncologically safe breast conservation, by performing a wide excision for larger tumours, while limiting the risk of postoperative deformities. A new concept of targeted oncoplastic breast surgery was developed to standardize published surgical methods, and to optimize oncological and aesthetic outcomes during breast-conserving therapy in an academic breast center. We analyzed the results of more than 900 patients undergone targeted oncoplastic breast-conserving surgery. Even after the new SSO-ASTRO-consensus guideline on margins for breast-conserving surgery with whole breast irradiation in stage I and II invasive breast cancer, we were able to demonstrate a practice-relevant rational and indication for targeted oncoplastic breast surgery.

Introduction

Breast-conserving therapy (BCT) consisting of surgical removal of the primary tumour followed by whole breast irradiation is an alternative to mastectomy which results in equivalent long-term survival [1]. Although rates of BCT have increased over time worldwide, there remains remarkably little consensus about what amount of normal breast tissue should be removed as a margin to minimize the risk of local recurrence. The conclusion of the SSO (Society of Surgical Oncology) - ASTRO (Americal Society of Radiation Oncology) Consensus Panel reinforced the importance of obtaining negative margins defined as no ink on tumour (invasive cancer or DCIS), to optimize local control [2]. The most important and potentially practice-changing conclusion was based on the finding in the meta-analysis of Houssami et al. that margins of 1, 2, or 5 mm were not associated with significantly different risks of local recurrences [3]. This meta-analysis could not be used to demonstrate whether a margin of no ink on tumour is adequate for patients with invasive lobular cancer, an EIC in association with invasive cancer, tumors of unfavourable biologic subtype (i.e., triple negative breast cancer), and in young patients.

Oncoplastic principles were introduced into breast-consering surgery 15 years ago to allow oncologically safe breast conservation, by performing a wide excision for larger or poorly located tumours, while limiting the risk of postoperative deformities [4]. Numerous surgical techniques with tissue displacement and tissue replacement have been published with different indications, incision lines and suggested rotation techniques, missing a systematic and structured approach for oncoplastic breast surgery [5]. During the last years we have defined five reconstruction principles introducing a new concept of breast-conserving surgery, termed *targeted oncoplastic breast-conserving surgery* [6]. We analyzed the oncological and aesthetic outcome of targeted oncoplastic breast-conserving surgery in the era of multimodal therapy of early breast cancer.

Materials and methods

We prospectively defined five major principles in oncoplastic breast surgery (Krämer et al., Breast Care 2007;2:299-306) based on the localization, size of the segmental resection defect, size of the breast and the necessity for skin resection during breast-conserving therapy. These major principles were: BCT-glandular rotation, BCT-dermoglandular rotation, BCT-tumoradapted reduction mammoplasty, BCT-thoracoepigastric flap, BCT-latissimus dorsi flap (Figure 1). We analyzed the clinical practicability, the oncological outcome and the cosmetic results. All patients received adjuvant postoperative radiotherapy. Systemic adjuvant treatment was applicated according to international guidelines. 35 % of the treated patients received neoadjuvant chemotherapy.

Results

Between 2013 and 2017 we performed 952 breast-conserving operations in 913 patients. For reconstruction of the partial resection defect during segmental resection the defined five oncoplastic principles were used as follows: glandular rotation (n=549; 58 %), dermoglandular rotation (n=149; 16%), tumoradapted reduction mammoplasty (n=135; 14%), thoracoepigastric flap (n=27; 3%) and latissimus dorsi flap (n=92; 9%). Partial mastectomy defects could be reconstructed during BCT with these five oncoplastic principles in 97%. The cosmetic results were good or excellent in 95%. A tumour-free resection margin of 1 mm was mandatory (according to german guidelines) and achieved in 91% during first surgery, while in 5% secondary mastectomy was required. Local-recurrences were diagnosed in 1,9% with a median follow-up of 4,2 years.

Discussion

Our understanding of breast cancer biology has advanced considerably since the initial trials comparing BCT and mastectomy

Correspondence to: Michael Friedrich, Breast Center, Deptartment Gynaecology and Obstetrics, HELIOS Medical Center Krefeld, Lutherplatz 40, 47805 Krefeld, Germany, E-mail: michael.friedrich@helios-gesundheit.de

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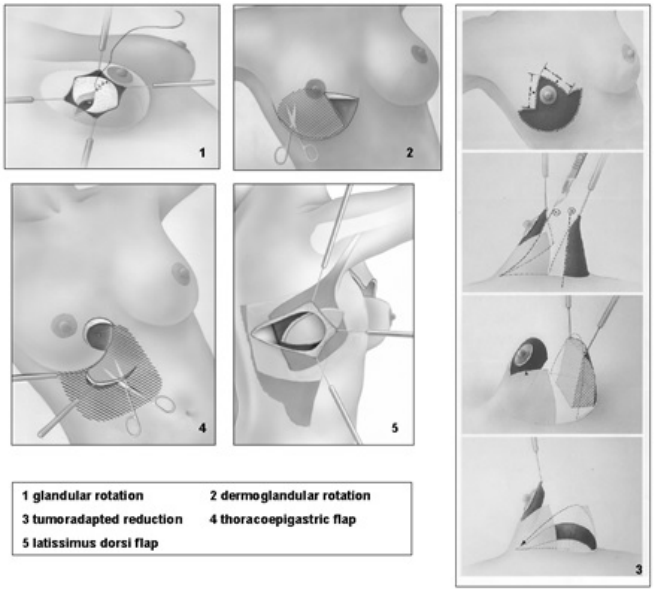

Figure 1. Targeted oncoplastic breast-conserving surgery

more than 30 years ago. It is apparent that factors such as tumour biology and the availability of effective systemic treatment are at least as important as microscopic residual disease burden in determining local control of breast cancer. Adoption of no ink on tumour as the standard negative margin definition has clear potential to decrease the use of re-excision and large quadrantectomy-type resections. Adoption of a minimal margin definition removes the rational for the *old* concept of oncoplastic breast surgery – introduced 15 years ago. The meta-analysis of Houssami *et al.* [3] could not be used to demonstrate whether a margin of no ink on tumor is adequate for patients with invasive lobular cancer, an EIC in association with invasive cancer, tumours of unfavourable biologic subtype (i.e., triple negative breast cancer), and in young patients. Further development of the traditional concept of oncoplastic breast surgery to a concept of *targeted oncoplastic breast-conserving surgery* with five defined oncoplastic principles allows the reconstruction of segmental resection defects during breast-conserving therapy with highest clinical applicability and results in favourable oncological and aesthetic outcomes. This approach might be useful in extending the indications for breast-conserving therapy. The adoption of a minimal margin definition does not remove the rational for a *new* concept of targeted oncoplastic breast surgery. Targeted oncoplastic breast surgery depends on the anatomical, pathological and reconstructive aspects of breast cancer to achieve favourable local outcomes for the patients – combining oncological and aesthetic prerequisites.

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