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Oncoplastic Breast Surgery – Pros and Cons for the Breast Surgical Oncologist

Faina Nakhlis*[a]

[a] *Department of surgical oncology, Women and Brigham Hospital, Harvard Medical School, Boston, USA*

As the role of local therapy in multidisciplinary management breast cancer has been evolving over the past few of decades, so has the concept of oncoplastic surgery. While the safety of breast conserving therapy, or BCT, which consists of lumpectomy and adjuvant breast radiotherapy, for invasive and in situ breast carcinomas is well-established[1,2], the idea of a lumpectomy for larger lesions has been a challenge, even when neoadjuvant systemic therapy could be expected to downsize the lesion of interest.

Oncoplastic surgery encompasses a number of procedures combining oncologic and reconstructive techniques utilized in the surgical management of larger breast lesions, and this strategy has been perfected and evaluated over the last 2 decades.[3,4] In this process, there have been a number of outstanding challenges related oncoplastic surgery, especially relevant for the surgical oncologist: 1) the oncologic safety and the degree of local control associated with a lumpectomy for a larger lesion; 2) the optimal timing for a reconstructive procedure to overcome the potential cosmetic deformities resulting from excising a larger volume of tissue.

As for the issue of local control, achieving clear surgical margins is a priority in ensuring the safety of BCT. A large number of studies have addressed this in both invasive breast cancer and ductal carcinoma in situ (DCIS), consistently demonstrating low re-excision rates in patients undergoing oncoplastic breast conserving surgery (4-12%), with breast conservation successfully achieved in greater than 90% of cases.[5-8] These findings can reassure us as surgeons of the reliability of preoperative clinical and imaging assessment of the malignancy planned for resection, and it is, undoubtedly, at least in part, attributable to more "generous" excisions taking place in anticipation of a reconstructive operation.

Factors that have been found to be associated with higher re-excision rates are BMI of least 25 kg/m^2 and above, presence of mammographic calcifications, presence of DCIS in the lumpectomy specimen and invasive lobular histology.[5,9] This is an important observation for patient counselling since the management of positive margins could be a challenge in cases when an immediate oncoplastic reconstructive procedure is performed during the same operation, as the latter extensively rearranges the breast tissue. In situations like these, when positive margins are reported after the operation, there is not clear guidance in the existing literature as to how a re-excision can be reliably performed, as the margins of interest would be difficult to be identified within extensively rearranged breast tissue. There is only anecdotal evidence related to intraoperative margin assessment (to enable margin clearance) and to intraoperative margin orientation (to facilitate initial lumpectomy wall identification for a possible subsequent re-excision). If there is no certainty about identifying the margin to be re-excised, the patient would likely require a mastectomy. Therefore, it may be more practical to complete the lumpectomy, with or without re-excisions, if necessary, and confirm the negative margin status and to plan the reconstructive procedure on a different date.

Additionally, there has been mounting evidence of excellent long-term local control achieved by oncoplastic surgery. In a single-institution retrospective analysis by Crown et al. which included 71 patients who underwent oncoplastic breast surgery, at a mean follow-up of 32.1 months, the local recurrence rate was 1.4%, and over 90% of patients reported excellent or good cosmetic outcomes.[8] A larger retrospective study by Mansell et al. included 980 patients from an institutional prospective database, of whom 104 underwent an oncoplastic procedure, 558 had standard breast conservation and 318 had mastectomies.[10] It is

Address for correspondence:
Faina Nakhlis, MD
Address: 1153 Centre St, Jamaica Plain, MA 02130, USA
Tel: +1 617-983-7777
Fax: +1 617-983-7779
Email: fnakhlis1@bwh.harvard.edu

noteworthy that the patients who underwent an oncoplastic procedure had larger and higher grade tumors, and fewer of them were estrogen and progesterone receptor positive, yet the 5-year local recurrence rates were very low in all 3 study groups (3% in the oncoplastic group, 3.4% in the standard lumpectomy group and 2% in the mastectomy group).[10] Subsequently, other studies have corroborated the oncologic safety of the oncoplastic approach.[11-13]

Another consideration is the safety of the oncoplastic approach following neoadjuvant chemotherapy. In a study by Adamson et al., among 429 patients who underwent an oncoplastic procedure, 122 underwent neoadjuvant chemotherapy.[14] In this study, the neoadjuvant chemotherapy group consisted of younger patients (median age 52 years vs. 57 years), but they had more advanced tumors, and there was no difference in the postoperative complication rates observed.

An important aspect of the oncoplastic approach is the possibility of the already mentioned significant tissue rearrangement potentially resulting in difficulty in interpreting future mammographic studies; however, a study by Piper et al. demonstrated that at up to 5 years following oncoplastic procedures and standard lumpectomies there were no differences in mammographic recalls and in the number of imaging-prompted biopsies.[15] As the comfort level with oncoplastic surgery has increased overtime, it is not surprising that the utilization of this approach has significantly grown.[16]

Admittedly, there is controversy regarding the optimal timing oncoplastic reconstructive procedure and adjuvant radiation. If the reconstruction is performed prior to radiation, a lower rate of radiation-related wound healing complications might be expected; however, subsequent radiation may affect the treated breast in a way that would compromise its symmetry with the contralateral breast, whether or not the latter had undergone an oncoplastic procedure. On the other hand, postponing of the oncoplastic reconstructive procedure until after radiation may be more optimal in achieving symmetry, but possibly at the price of a greater risk of healing issues associated with radiation. As these procedures become more prevalent, there will be a better consensus on the most appropriate timing of the reconstructive operation with respect to adjuvant radiotherapy.

In summary, there is a convincing body of evidence to-date as to the oncologic safety of the oncoplastic approach to breast cancer, as it appears that more generous excisions and meticulous negative margin achievement result in outcomes similar to those seen with standard BCT. It may be more rational to complete the oncoplastic lumpectomy to ensure the negative margin status, and to proceed with the reconstructive procedure at a later date, in order to facilitate reliable margin identification, if a re-excision is necessary. Finally, it remains unclear whether the timing of oncoplastic reconstruction is more optimal when performed before or after adjuvant radiation therapy. Therefore, it is best for the patient to have this discussion with a plastic surgeon prior to any surgical interventions to facilitate shared decision-making.

Conflict of Interest

None.

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