

Coming of age of oncoplastic breast surgery

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Breast surgery has emerged as a defined specialty across European and other countries over the past 25 years. Specialization has been driven by a rising incidence of breast cancer, the development of oncoplastic breast surgery techniques, and enhanced patient expectations in terms of treatment and outcomes. The modern specialized breast surgeon must acquire a spectrum of expertise covering oncology, radiology, breast surgery and an understanding of relevant principles and practice of plastic surgery. In addition, they must also possess excellent team working, communication and clinical decision-making skills.

Increasing use of neoadjuvant therapy to downstage locally advanced disease has permitted more successful rates of breast-conserving surgery (BCS). A progressive decrease in the proportion of patients requiring mastectomy in favour of BCS has coincided with increased demand for either immediate or delayed breast reconstruction together with the evolution of oncoplastic procedures. The latter involve utilization of surgical techniques developed by plastic surgeons for cosmetic reshaping of the breast, subsequently applied by breast surgeons in an oncological context for more extensive resections in BCS.

Surgical treatment must, on the one hand, maximize the chance of negative resection margins, thereby reducing the risk of local recurrence, but on the other hand achieve good cosmetic results. There is an innate conflict between the basic aims of oncological and plastic surgery: eradication of locoregional disease while preserving residual breast tissue for optimal cosmesis. The challenge of oncoplastic breast surgery is to reconcile oncological and aesthetic aims to optimize patient outcomes.

Oncoplastic breast surgery aims to retain or enhance the natural appearance of the breast following excision of a cancer. Techniques such as fat transfer can be employed to correct minor defects consequent to surgery and/or radiotherapy, but prevention of breast deformity is preferable to its treatment. Early concerns were raised that oncological outcomes might be compromised in attempts to minimize the volume of tissue resected for cosmetic purposes. There is no evidence, however, that oncoplastic breast conservation techniques are less likely to achieve negative resection margins, or to be associated with increased rates of re-excision^{1,2}. On the contrary, owing to the greater volume of tissue removed with oncoplastic procedures, tumours can be excised with a high chance of clear resection margins at initial surgery³. A negative margin does not always indicate the absence of residual disease within remaining breast tissue, but implies a residual burden of tumour sufficiently low to be controlled with adjuvant treatments such as radiotherapy and chemotherapy/hormone regimens. Local recurrence is thus determined by a combination of surgery, tumour biology, radiation and systemic therapies⁴. An overall reduction in breast volume from 'displacement' techniques may also facilitate delivery of radiotherapy by optimizing breast positioning and reducing dose inhomogeneity.

Nonetheless, unresolved controversies remain for oncoplastic breast conservation, including identification of a positive resection margin following glandular mobilization, accurate targeting of the tumour bed for a radiotherapy boost⁵, the upper size limit for safe breast conservation⁶, and sequencing of radiotherapy with two-stage flap-based partial breast reconstruction.

Skin-sparing techniques have been widely adopted to improve cosmetic outcomes following reconstruction and are now acknowledged to be safe in terms of disease recurrence, provided tumours are non-inflammatory and there is no direct skin infiltration⁷.

A further development of the skinsparing approach is nipple-sparing mastectomy, which can further enhance aesthetic outcomes. However, preservation of the nipple–areola complex (NAC) is of unproven safety, and should be practised selectively only for small unifocal tumours located some distance from the NAC or as a prophylactic procedure⁸. The areola can readily be dissected off the underlying parenchyma without leaving remnant breast tissue, although a thin layer of breast tissue must be retained to ensure viability of the nipple.

Breast surgery is a rapidly evolving specialty with frequent exposure to novel devices and techniques. In particular, some of the newer implantable devices for breast reconstruction are released on to the market with limited clinical and scientific evaluation.

The introduction of acellular dermal matrices and synthetic meshes for implant-based reconstruction have significantly broadened indications for breast reconstruction and promoted uptake. However, despite persistence of surgical enthusiasm, some devices have been officially withdrawn from clinical use owing to the emergence of safety issues. Thus, a judicious approach to the adoption of newer technologies outside the setting of clinical trials should be exercised. When trialling new devices, it is imperative to maintain a comprehensive database to permit subsequent analysis of selection criteria, complications and outcome measures. Local registries can be interlinked and form part of a national, or even global, registry.

Guidelines published by the Association of Breast Surgery in the UK for best oncoplastic practice detail key quality criteria recommendations that cover all aspects of oncoplastic breast surgery⁹. These include preoperative planning, postoperative care, complication rates, training and education, and patient satisfaction outcomes. All specialist breast surgeons should maintain personal records of procedures undertaken, including complication rates, oncological outcome data and patient satisfaction using validated tools. In addition to quality assurance, these surgeon-specific outcome data inform the consent process and aid patients in making decisions when more than one surgical option is available.

Breast surgery continues to evolve apace, and surgeons must ensure their knowledge and skills base is updated regularly. Several well established oncoplastic meetings and workshops exist that provide information on the latest and best practices^{10,11}. Surgeons can further refine their practical repertoire by attending master classes in oncoplastic breast surgery, such as those under the aegis of the European Society of Surgical Oncology¹², or by visiting other institutions to gain valuable hands-on experience in new techniques. Current development of models for surgical simulation will facilitate training in more complex oncoplastic techniques. Levels of professional attainment in terms of knowledge and skills can be assessed with dedicated breast surgery examinations such as the European Board of Surgery Qualification examination¹³ and the master's degree course in oncoplastic breast surgery¹⁴, which provide a specialty-specific qualification and accreditation.

Patients are increasingly well informed about treatment options; widespread use of social media and the existence of online patient blogs and communities have led to heightened patient expectations regarding outcomes. The surgeon should be aware of unrealistic expectations and direct patients to authorized websites to gain accurate and balanced information. In addition, several tools are now available to aid patient decisionmaking, including three-dimensional breast simulation tools to provide a visual approximation of postoperative aesthetic outcomes.

Patients are now surviving longer owing to advances in breast cancer treatment, and expectations have increased accordingly. Improved survivorship has implications for health-related quality of life, and healthcare workers must strive collectively to ensure optimal oncological, cosmetic, functional and psychosocial outcomes. Surgeons must balance the needs of patients in each of these domains and be prepared constantly to face new challenges. The number of elderly patients with breast cancer is increasing, and oncoplastic surgery should be available to those who are otherwise fit despite their chronological age¹⁵. Women who have undergone oncoplastic breast conservation or whole breast reconstruction may require further surgical intervention for late complications or to enhance breast aesthetics. Budgetary restraint can be aided by sensible planning of initial breast cancer treatment that maximizes oncological and cosmetic outcomes and minimizes the need for corrective surgery at a future date.

Disclosure

The authors declare no conflict of interest.

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