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48.1 Introduction

There has been major progress in breast cancer surgery over the past few decades. Conceptually, it must now be performed with special attention to cosmetic results and the quality of life of the patients. Disfiguring and mutilating surgical procedures can no longer be biologically and oncologically justified for most patients under screening programs. In this way, oncoplastic surgery is a necessary evolution and a final refinement of breast cancer surgery. It combines oncologic and plastic surgery techniques in order to improve the final aesthetic outcomes. It includes appropriate oncologic surgery, immediate reconstruction using the full range of all available plastic surgery techniques, and immediate correction of contralateral breast symmetry, whenever indicated [1–10].

The original concept of oncoplastic surgery and the philosophy of work is already consolidated since there are no significant changes in basilar oncologic principles. Local control in terms of margins and surgical care is the same as in breast-conserving treatment and mastectomy. This advance is now the standard practice in many centers in different countries [1–7].

Three important facts are considered as the main reasons for a change in the system of breast surgery training. The first one is that most breast cancer patients do not receive any kind of breast reconstruction. The classic model “breast surgeon–plastic surgeon working together in all cases” works very well but is clearly not sufficient to cover all of the new breast cancer cases. The second one is that immediate breast reconstruction with volume displacement and replacement techniques has better oncologic results in breast-conserving surgery in terms of margins, lower index of re-excisions, better local control of disease, and positive results regarding radiotherapy planning, particularly for the group of patients with gigantomastias. Although there have been few studies in oncoplastic surgery (most of them are series of cases or retrospective cohorts of patients), it is clear that the combination of plastic surgery techniques and breast-conserving surgery do not compromise clear excision margins nor the long-term oncologic results. Moreover, immediate breast reconstruction has better aesthetic outcomes than delayed breast reconstruction after conservative surgery and mastectomies. The third one, and perhaps the most important of them, is the cultural and psychological representation of the breast in postmodern society. Patients with pronounced asymmetry after breast cancer surgery are more likely to feel significantly stigmatized. They have more fear of death, increased psychosocial problems due to loss of their femininity, more depressive symptoms, and, consequently, more harm to their quality of life independent of their chances of cure [6, 8, 10].

So, this new arrangement is perfectly well justified. Fellowships need to expand the current curriculum in order to create a new specialist surgeon who performs all kinds of reconstructions—the so-called oncoplastic surgeon. Of course, a single surgeon with both oncologic and reconstructive backgrounds requires special training in cross-specialty techniques to undertake all these procedures to the highest standard and with new responsibilities and new medicolegal implications. The aim of this chapter is to address the qualifications and limits in oncoplastic surgery training and practice.

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48.2 Who is the Oncoplastic Surgeon?

The new generation of breast surgeons should be oncoplastic surgeons. In other words, oncoplastic surgeons are the specialist breast surgeons. Although there is controversy in some countries as to whether breast surgeons or plastic surgeons should perform breast reconstruction, the breast is an aesthetic–functional organ, and surgeons who perform breast surgery should also consider the aesthetic and functional outcomes in all their procedures on the breast. Even those breast surgeons who work together with plastic surgeons can perform high-quality surgery if they have broader skills in techniques related to plastic surgery of the breast. On the other hand, plastic surgeons who have deeper knowledge of all oncologic aspects of breast surgery work better with integration in breast teams. Moreover, there is no longer a clear limit between the aesthetic and the oncologic aspects in breast oncologic surgery.

It is necessary to develop international standards for training and a special qualification for oncoplastic surgery. Fellows eligible for acceptance into a comprehensive breast cancer training program for oncoplastic surgery can be specialists from gynecology, general surgery, and plastic and reconstructive surgery. The real aim of this new model is to expand high-quality breast reconstruction in order for it to be available to most breast cancer patients.

48.3 Breast Training Competences in Oncoplastic Surgery

An oncoplastic surgery fellowship training curriculum must be multidisciplinary and include knowledge from various breast cancer correlated disciplines, such as molecular biology and genetics, anatomy and physiology, epidemiology, bioethics and legal medicine, medical photography, radiology, pathology, radiotherapy, and clinical oncology. This knowledge is the basis for breast cancer surgery decisions.

Regarding specifically oncoplastic surgery, there are three major topics to be covered in the training of oncoplastic surgeons: developing specific surgical skills, ethics, and openings for research opportunities.

48.3.1 Developing Skills

Oncoplastic surgeons should be well trained and competent in all aspects of breast oncology and oncologic surgery of the breast, have broad understanding of breast defects and all their reconstructive requirements, have competence in almost all breast reconstructive techniques, and be

proficient in prevention and care of all of the potential complications [6].

There is no formal training of breast surgeons in breast reconstruction techniques, and training differs over the world. Competence in performing these surgical procedures needs to be graduated in a specific classification in order to standardize training programs. The classification proposed here is based on different levels of competence:

- *Level I.* Monolateral and displacement techniques: aesthetic skin incisions, deepithelization of the areola margins, glandular mobilization and reshaping techniques, purse-string sutures for central quadrant reconstruction
- *Level II.* Bilateral and replacement techniques: breast reduction (inferior and superior pedicles, and round-block techniques), mastopexy, Grisotti flap, nipple and areola reconstruction
- *Level III.* Expander/Implant techniques: immediate breast reconstruction with temporary expanders or implants, and contralateral symmetrization
- *Level IV.* Autologous flap techniques: pedicled or free flaps, or a combination of techniques

Since most breast cancer patients need level I–III techniques, it is highly recommended that the basic surgical training of oncoplastic surgeons be in these competences. Specific competence in plastic surgery techniques of the breast is not required at level I, since general surgeons, working only on the compromised breast, do most of these procedures now. Level II requires specific competence in reduction mammoplasty techniques in order to repair major partial defects after breast-conserving surgery, and to achieve better symmetry of the contralateral breast whenever necessary. Level III requires competence in indications, surgical techniques, and management of complications with breast implants. A high standard of knowledge of different qualities of implants is necessary in order to individually select which patient is better served with which implant.

If surgeons are well trained in immediate breast reconstruction with expander/implants, in superior and inferior pedicle breast reductions, and in round-block techniques, they will be able to solve more than 90 % of their cases. So, level IV competence (with flaps) will require advanced surgical training.

The real point to consider is how to set the limits for this new discipline, which is translational among different specialties. The challenge is to train surgeons to be competent in all these techniques in order to achieve high-quality breast surgery for most breast cancer patients, reducing the differences between different centers. Surgeons must be able to recognize their own limits using this classification.

Since there is increasing demand for training in oncoplastic surgery techniques, and breast surgeons have different backgrounds and work in different scenarios, it is

difficult to establish a minimal number of cases per surgeon. Evidence-based training in oncoplastic surgery is more complex to implement than it was before the introduction of sentinel node biopsy. Here the numbers of techniques involved are numerous, and many of them are not part of regular training in general surgery.

The training of the new generation of breast surgeons must include at least the first three levels of competence in the curriculum in order to solve most breast cancer cases. At least 20 cases per technique per surgeon under supervision in accredited breast units and/or in cadavers is recommended as a learning curve.

48.3.2 Ethics

The demands and expectations of patients tend to be higher with oncoplastic surgery. Although delay in the diagnosis of breast cancer remains the commonest reason why breast specialists are sued for malpractice in the USA, there is a potential for increasing issues in oncoplastic surgery. The appearance of the breast is becoming a critical component in breast cancer treatment for patients. It is expected that medicolegal analysis will change with these advances. The essential and central element is the duty of the breast surgeon to obtain a good aesthetic outcome without compromising oncologic control. Basically, the oncologic scenario is easy to document and analyze individually in a medicolegal scenario as it is standardized now: mastectomy versus conservative indications, local control with clear margins, and right adjuvant and neoadjuvant treatment indications. The reconstructive part of oncoplastic surgery is the new and real great difference in the medicolegal analysis. It is clear that oncoplastic surgery is not like aesthetic surgery in terms of outcomes and judgments. It is both an oncologic and a reconstructive procedure, not a purely aesthetic breast surgery. It has all the oncologic limits in its background and the aim is not only aesthetics. All the limitations must be included in the informed consent in order to avoid errors of interpretation and communication between the surgeon and the patient. Of course, the integration of plastic surgery techniques with oncologic breast surgery will potentially improve aesthetic outcomes, but it will add new responsibilities for the surgeon too. Regular protocols and respect of levels of individual competences and limits may avoid both additional risks to the patients and increasing liability.

48.3.3 Research

There are many research opportunities to be explored in oncoplastic surgery, such as how improve oncoplastic surgery training, how to decrease re-excision rates, how to

decrease complication rates, how to decrease recurrence rates, how to optimize operating room time, how to optimize aesthetic outcomes, how to reduce costs of treatment, and analysis of the aesthetic and psychological benefits of the techniques.

48.4 Surgical Mentoring

Mentoring, according to Rombeau et al. [11], is the provision of personal and professional guidance, usually to younger surgeons. Education and growth in surgery is highly dependent on this old process, maybe more than in other disciplines in medicine. The complete concept of mentoring, according to these authors, has three basic characteristics related to the mentor's personality and ability to teach and evaluate the technical skills of a trainee: experience, trust, and commitment. Recent changes in breast surgery with the advent of oncoplastic techniques in the past two decades are bringing different methods of mentoring and require new strategies in teaching and setting limits for the mentee.

Leaders in oncoplastic surgery have an important role, and are an important part of the future of breast surgery. There is worldwide interest in the career benefits of breast surgery with these new opportunities in oncoplastic surgery. There are also challenges that are completely different from the traditional surgical mentoring process. There is no standard and no consensus between breast surgery societies and plastic surgery societies all over the world on how to establish training programs, and concurrently there are an emerging number of surgeons who are now interested in learning these techniques [12] So, it is time to revisit our pedagogical way of teaching and a lack of formal guidelines in mentoring oncoplastic surgeons.

There are three generations of oncoplastic surgeons. The first were the pioneers who began to do these surgical procedures between 1980 and 1990, most coming from Europe after the consolidation of breast-conserving treatment. The next were young breast surgeons who trained with the pioneers or went to progressive plastic surgery departments to obtain specific training in plastic and reconstructive techniques. The third generation is the new breast surgeons who are now receiving this background in their regular training as a specialty, as in Brazil, or as a subspecialty in plastic surgery or in general surgery, as in the UK. Between the second and third generations, however, there is an important gap.

This group in the gap is surgeons who perform most breast cancer surgical procedures all over the world and have had no specific training in oncoplastic techniques or are not able to offer breast reconstruction to most of their patients because of difficulties or unavailability of plastic

surgeons to work with them. Many of these surgeons are now looking for training opportunities in short or intensive courses in order to learn techniques that can help them with their patients. They are not young residents or fellows, but are already specialized surgeons, with different degrees of experience and technical skills in breast surgery. How do we provide practical guidance for mentors of oncoplastic surgeons to guide these colleagues? What is the philosophy behind oncoplastic surgery and its implications for mentoring? What are the limitations for these different courses? How do we set the limits? These are the unsolved, although fundamental, questions for breast surgery in the next few years.

The basic question is what oncoplastic surgery is and what the philosophy behind it is. According to Werner Audretsch, the German surgeon who originally coined the term, oncoplastic surgery is tumor-specific immediate breast reconstruction [13]. So, it is not considered a new specialty. It is a gray zone between plastic surgery and breast surgery, a common area of interest for both specialties. It does not make sense anymore to discuss who should do oncoplastic surgery (and consequently who should not do it), because even plastic surgeons who have training in all reconstructive techniques should now have experience in all breast cancer treatments and their consequences in order to decide on the best approach for each individual patient. They cannot think only in terms of aesthetics anymore. At the same time, breast surgeons have an oncologic background, but usually do not have training or experience in plastic and reconstructive techniques. However, they should not be limited only to oncologic outcomes. This fragmented approach leads to negative consequences in an organ that is aesthetic and functional and to negative consequences for the patient's quality of life. Most breast cancer patients are currently not undergoing breast reconstruction, even in developed countries. In contrast, oncoplastic surgery is a translational way of doing breast surgery, by one surgeon, or by a team. Breast reconstruction should be integral to breast cancer treatment for most patients, not an option [2, 3, 6, 8, 12–14].

Considering that oncoplastic surgery is a group of techniques for breast cancer treatment concerned with oncologic and aesthetic outcomes, and that there are many differences in breast surgery training worldwide, our focus should be on how to achieve individualized skills in different techniques. In countries such as Brazil, breast surgery (which is coined "mastology") is a specialty, so naturally the Brazilian Society of Mastology is now including oncoplastic surgery in residency training programs, and mentors are adapting themselves to this new reality. In the UK, oncoplastic

surgery is a subspecialty and belongs to plastic surgery and general surgery, and in the USA, breast surgery is part of a general surgery background [2, 3, 8, 12, 13]. All of these different approaches have particular challenges for training surgeons.

We should establish a universal mentoring culture for oncoplastic surgery. In previous eras, a single mentor characterized mentoring of young surgeons. Multiple mentors have become the dominant surgical model for most surgical specialties in a world of limited time [11]. In oncoplastic techniques, it is quite different. We are mentoring residents, fellows, and specialized surgeons of different ages and levels of experience. Particularly, surgeons who perform breast surgical procedures should be skilled in oncologic techniques and principles, mammoplasty techniques (basically superior and inferior pedicles and round block), implants, and flaps. Some countries offer more facilities for training directly with patients in the operating room, others with cadaver laboratories. There is no universal pattern for mentoring oncoplastic surgeons as there is in other specialties. A single oncoplastic surgeon could be more effective as a mentor than a team in some situations, although in others a team would be more appropriate.

Do short courses solve the problem? Of course they do not. But they are important because they help surgeons to learn some techniques, refine other ones, and increase their interest in learning oncoplastic surgery in order to improve their practice. However, they do not provide a complete oncoplastic surgery background because mentoring is necessary. Oncoplastic surgery is more than learning in an operating room or in a cadaver laboratory. It is well-planned surgery, and in order to properly learn the techniques, it is necessary for preoperative evaluation to be taught during the breast marking and the decision making process. After the operation, we should deal with specific complications (and how to solve them), which are different from lumpectomy, mastectomy, axillary dissection, or sentinel node biopsy complications. But how should we mentor oncoplastic surgeons, and for how long? This depends on the previous surgical background of the mentee, and it is difficult to establish a standard norm. Oncoplastic surgery is more subjective than other surgical disciplines or regular residency training. The learning curve should be individualized for each technique and for each surgeon, not for oncoplastic surgery in general, because it is not a new specialty, but a surgical refinement of conservative and radical approaches in breast cancer surgery. Mentors should identify technical limits and establish the borders for their mentees using a model of levels of competence. Objective variables of technical skills should be based on competency-based training.

48.5 Conclusions

It is necessary to ensure the safe introduction of oncoplastic surgery into surgical practice. Surgeons have two important aims to address in this new reality: to perform good local control of disease and to focus on the quality of life of all breast cancer patients. The quality of life is a matter of breast surgery decisions at the moment of breast cancer diagnosis. So the curriculum in breast surgery must expand the limits and the responsibilities in order to better change the reality of breast cancer patients. There is an exciting future for mentoring oncoplastic surgeons. Instruments for performance assessment will be Internet-based, simulating real cases, with virtual reality and telementoring. Finally, oncoplastic surgery is completely reshaping breast cancer surgery. But the way that this is accomplished will depend on how mentors help the present and future generations of surgeons bridge the gap. Overall, mentoring must be individualized, ethically founded, and committed to present and future patients, to mentees, and to new potential areas for research.

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