

Cicero Urban and Mario Rietjens

11.1 Introduction

Oncoplastic surgery represents an important evolution in breast cancer surgery. It allows better aesthetic–functional outcomes and consequently an improvement of the psychological aspects of patients with breast cancer, as it broadens the range of indications for breast-conserving treatment (BCT). The various techniques for immediate reconstruction must be dealt with case by case so the best results concerning the aesthetic–functional aspects can be achieved. For delayed reconstruction, the results are generally inferior to those obtained in immediate surgery, and in many cases major surgical procedures are required. Therefore, the emphasis of this new phase in breast surgery must be on immediate reconstruction associated with the integration of oncologic and aesthetic concepts by the surgery team and by the single surgeon [1–18].

However, it is hard to eliminate completely the risk of local recurrence after BCT. A local failure might reflect a disease with more aggressive biological characteristics, as well as a new primary tumor or even a failure of the treatment. These failures may occur as a consequence of selection of patients or inadequate treatment, but they tend to reduce after the use of high-quality imaging, postoperative radiotherapy, appropriate adjuvant systemic treatment, and surgical excision with negative margins [19, 20]. Concerning this last point, the surgeon daily faces the dilemma of performing resections with wide margins, aiming to reach ideal oncologic control, and at the same

time, not removing so much breast tissue, which could result in major deformities or asymmetry between the breasts. If local–regional control represents the main target of oncologic surgery, the aesthetic result is the basic principle of breast conservation from the very beginning.

A way to soften this conflict is to apply plastic surgery techniques to breast cancer surgery. This new concept, which has been spreading in some centers for treatment of cancer in Europe, is based on three fundamental points: ideal cancer surgery, homolateral reconstruction, and immediate contralateral remodeling applying plastic surgery techniques [1–18]. Therefore, it allows more extensive resections in BCT and it does not negatively affect the final aesthetic results [21, 22]. The focus of oncoplastic surgery, as well of other techniques such as sentinel node biopsy, with regard to breast surgery is to improve quality of life of patients through treatments that can be more effective and less aggressive.

This chapter will deal with planning oncoplastic surgery in early breast cancer, which is as important as the operating time for this surgery, in order to achieve the best oncologic and aesthetic outcomes and to reduce errors.

11.2 Patient Selection

Oncoplastic surgery is more complex and time-consuming than lumpectomy and quadrantectomy. Thus, the selection of patients from the oncologic, aesthetic, and psychological point of view is critical. All attempts should be made to minimize the risk of positive margins, which are difficult and sometimes impossible to reassess in a second surgical procedure, and to reduce and prevent complications that may delay adjuvant treatments. Patients strongly motivated to preserve their breasts better tolerate this kind of surgery. Therefore, there are some established indications for oncoplastic surgery in BCT. The main one is for patients with a mammary resection volume of more than 20 %, and especially in the case of macromastia, where results from

C. Urban (✉)
Oncoplastic and Reconstructive Division, Breast Unit, Hospital
Nossa Senhora das Graças,
Positivo University, Curitiba, Brazil
e-mail: cicerourban@hotmail.com

M. Rietjens
Division of Plastic and Reconstructive Surgery,
European Institute of Oncology, Milan, Italy
e-mail: mario.rietjens@ieo.it

Table 11.1 Indications and relative contraindications for oncoplastic surgery in breast-conserving surgery

Indications	Relative contraindications
Resections over 20 % of breast volume	Extensive tumors located in medial regions
Macromastia	Low-volume breasts, and without ptosis
Severe ptosis and asymmetry	Previously irradiated breasts
Need for large skin resections inside the mammoplasty area	Large skin resections beyond the mammoplasty area
Central, medial, and inferior tumors	Tobacco addiction and uncontrolled diabetes
Previous plastic surgery of the breast	Exaggerated patient expectations with aesthetic results

skin-sparing or nipple-sparing mastectomy are usually unsatisfactory and the oncoplastic approach may also favor radiotherapy planning [23].

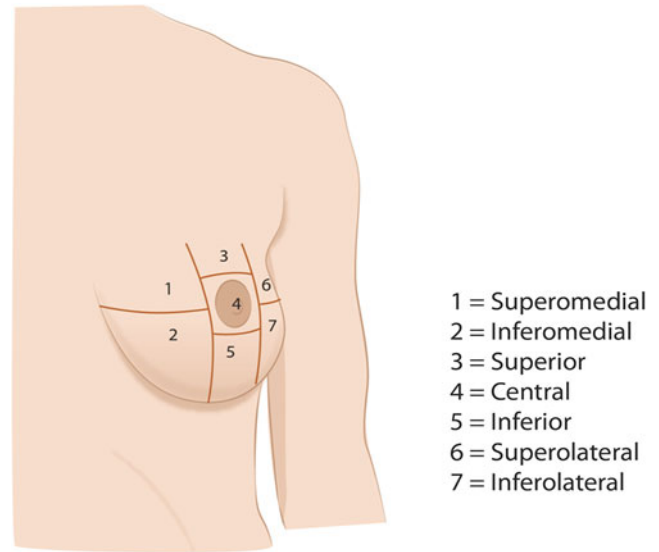
Current indications and relative contraindications for oncoplastic surgery in BCT are given in Table 11.1.

11.3 Preoperative Planning

It is essential that the choice of the technique for oncoplastic surgery in breast-conserving surgery depends on elements related to the tumor location, size, and multifocality/multicentricity, characteristics of the breast, and clinical evaluation of the patient. Although the only significant element mentioned as an aesthetic risk in breast-conserving surgery in the Cochrane evaluation was a mammary resection volume over 20 %, in clinical practice there are other individualized risk factors that should be observed [23]:

- Tumor size/breast size
- Multicentricity and multifocality
- Location of tumor and proximity to skin
- Distance between the tumor and the nipple–areola complex (NAC)
- Previous and future radiotherapy
- Previous mammoplasty
- Volume and shape of the breast
- Level of mammary ptosis and breast asymmetry.
- Liposubstitution level.

In some circumstances, associated clinical conditions may influence the choice of the most appropriate technique. Diabetic patients, obesity, tobacco addicts, those with collagen diseases, and those above 70 years old are subject to risks concerning unsatisfactory aesthetic results and skin-healing complications are greater. Major resections and wide NAC dislocations may bring additional risks of fat necrosis and partial or total NAC losses [23].

**Fig. 11.1** Breast quadrants for oncoplastic surgery

The ideal location for a tumor is within the wide resection area, or inside the mammoplasty area. When the tumor is close to the skin and outside this area, the oncoplastic procedure may be more complex and it may require combined techniques, whose results are not always satisfactory. In such cases, skin-sparing or nipple-sparing mastectomy should be considered as an option, as well as in cases where a major resection of the skin is needed. Flaps such as latissimus dorsi flap, which has a different color and texture compared with the breast, usually lead to unsatisfactory results, and therefore should be considered as an exception [23].

A high-volume breast with severe ptosis allows surgical procedures with wider margins and usually leads to more satisfactory results. Patients with macromastia represent a formal indication for oncoplastic surgery owing to better radiotherapy planning. In cases of previous breast augmentation plastic surgery, it is necessary to take into consideration that the breast volume is not the real one, and consequently some considerable deformities may result. The biggest problem concerning oncoplastic surgery is dealing with young patients, with a conic breast, without mammary ptosis, and with low or medium volume. In such cases, according to the location or tumor size, local flaps offer little chance of good results, so skin-sparing or nipple-sparing mastectomy with immediate reconstruction may be the best choice [23].

The decision for oncoplastic surgery is based on oncologic and aesthetic concepts and principles, so a structured guideline is not possible to assist in all cases with all involved variables, but it can help the decision-making process. Basically, the flowchart for planning oncoplastic surgery should take into consideration the features of the patient's breast and the tumor size (Figs. 11.1 and 11.2) [23].

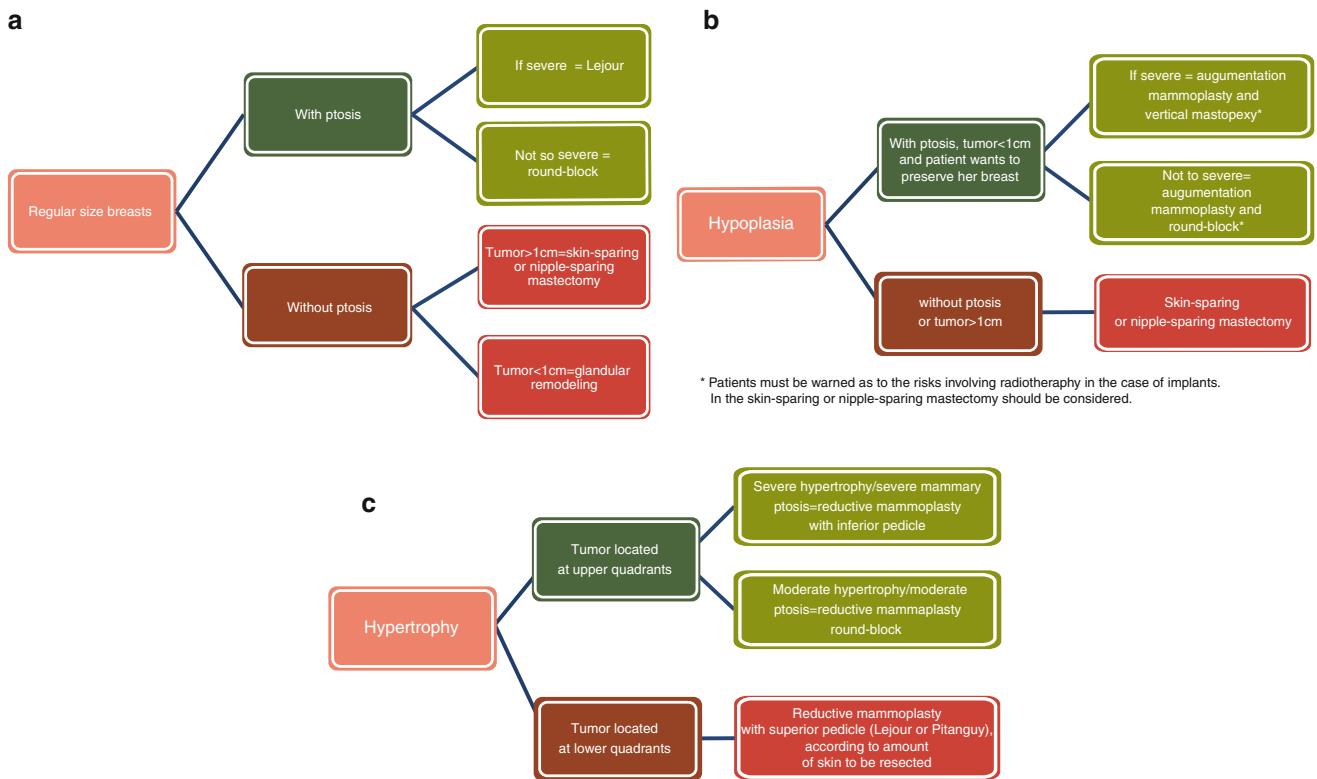
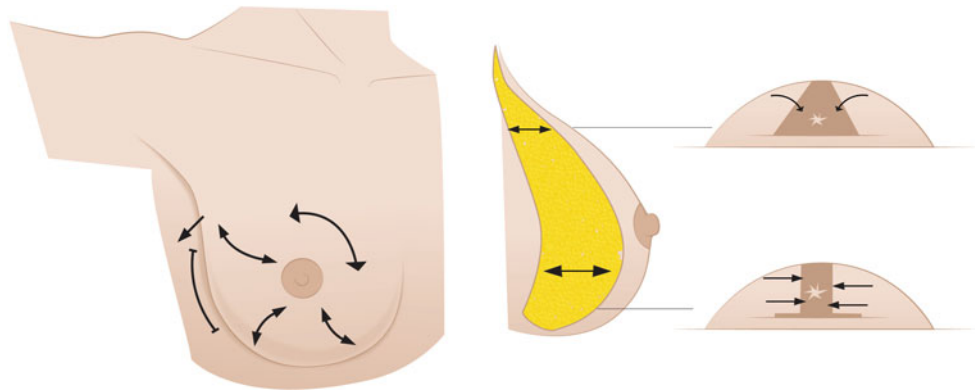


Fig. 11.2 Decision flowchart for planning oncoplastic surgery (Modified from Urban et al. [23])

Fig. 11.3 Class I glandular flaps: skin incisions and plan for glandular reshaping



11.4 Immediate Partial Breast Reconstruction Techniques

11.4.1 Class I Techniques

11.4.1.1 Planning for Glandular Flaps

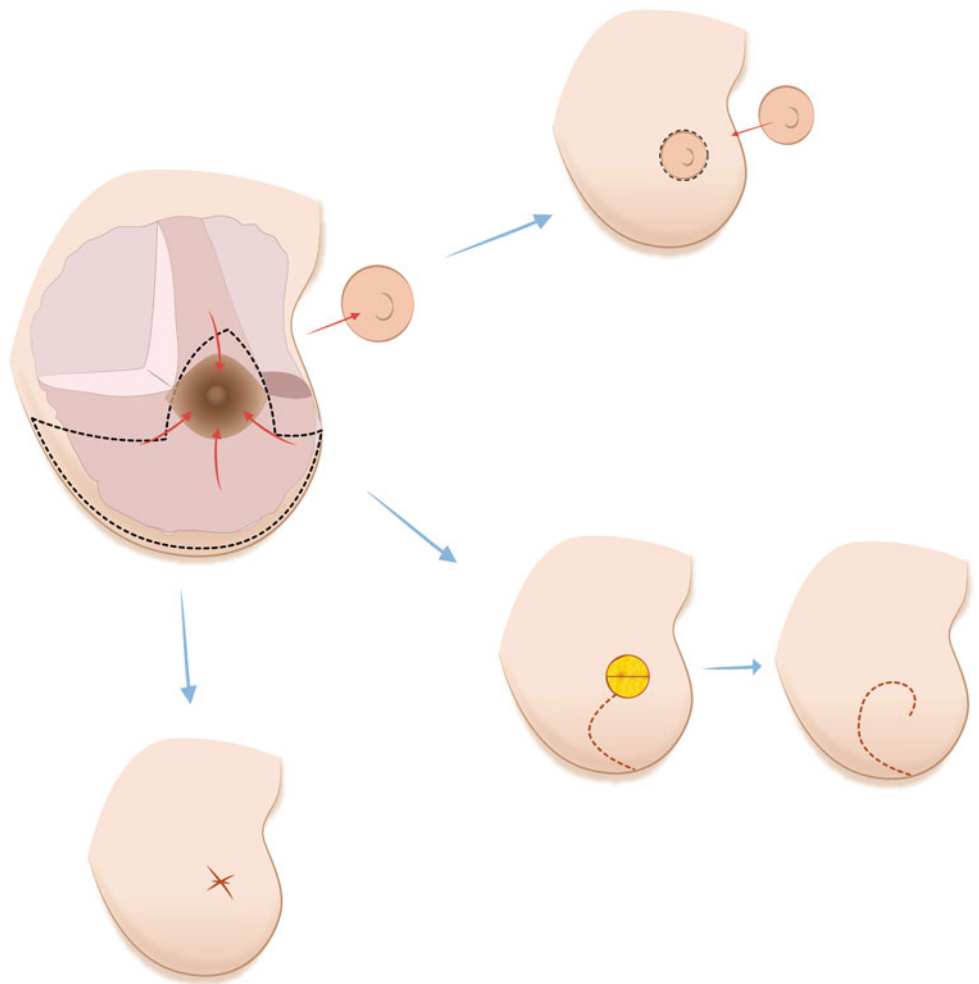
This class I technique consists of moving glandular flaps around the defect caused by classic quadrantectomy or lumpectomy resections, in an attempt to cover it completely. It is preferentially indicated for premenopausal patients, when the glandular component of the breast is greater,

therefore reducing the risk of liponecrosis in the postoperative period. This technique is also indicated in cases of tumors located in the upper quadrants, where the mammary gland is less thick; and even if there is a small filling defect, such a defect is not so visible. The opposite effect happens in the lower quadrants, where the mammary gland thickness is more important to consider, and if an adapted technique is not applied, the resulting aesthetic defect may be disastrous. Glandular reshaping in lower portions of the breast is possible for small tumors, and in a vertical or oblique way. Planning for the position of the incisions should consider the quadrant of tumor location (Figs. 11.3 and 11.4).

Fig. 11.4 Class I glandular reshaping for superior quadrants



Fig. 11.5 Central quadrant plan for reconstruction with the tobacco purse string technique and a cutaneous-glandular flap



11.4.1.2 Planning for Central Quadrant Techniques

This represented a great innovation in the early days of BCT, as up to some years ago having a retroareolar neoplasia was synonymous of mastectomy. Immediate breast reconstruction techniques for central quadrant resections

may differ according to breast volume, level of ptosis, and shape of ptosis (either vertical or lateral). For a breast without ptosis or with slight ptosis, it is possible to use the glandular suture in a tobacco pouch. Two or three layers of glandular suture in a tobacco pouch allow one to obtain the central projection of the mammary cone, and the cutaneous

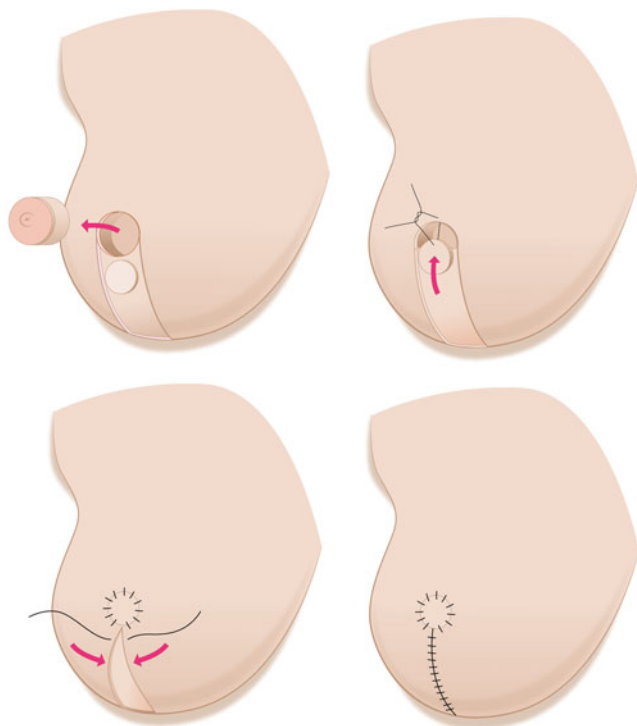


Fig. 11.6 Plan for Grisotti's flap for the central quadrant

suture also in a tobacco pouch would produce a residual scar within the area where the future areola will be reconstructed, therefore causing the scar to disappear almost completely (Fig. 11.5). The disadvantage of this technique is that there is no good connection with the cutaneous edge and consequently there might be delay in the healing process. A cutaneous–glandular flap can be an alternative and can also result in a good outcome in these cases.

For large breasts with oblique ptosis, it is possible to use a technique described by Galimberti et al. [24], derived from the reductive mammoplasty technique based on the rotation of the inferolateral glandular pedicle, preserving a cutaneous island that replaces the areolomammillary complex (Fig. 11.6). This might be the first oncoplastic technique described in the literature, as it was a direct adaptation of the plastic surgery technique to BCT.

11.4.2 Class II Techniques

11.4.2.1 Planning for Periareolar Techniques

These class II techniques are inspired by reductive mammoplasty techniques proposed by Góes [25] and Benelli [26], in which a major glandular cutaneous undermining procedure for remodeling through a periareolar scar is performed. It is indicated for small or medium-volume breasts with little or average ptosis. The great advantage of these techniques is mainly oncologic, as they allow for a

tumorectomy or either a simple or a double quadrantectomy in any part of the breast, except for the central quadrant.

The preoperative drawing is done with the patient standing up, and basically it is necessary to calculate only two points (A and B). Point A represents the position of the upper edge of the areola, which can be calculated by different methods. The simplest method is that this point corresponds to the transition from the upper two-thirds of the arm to the lower third. Another method, proposed by Pitanguy [27], is to calculate initially the future position of the nipple, which will be the projection of the tip of a finger placed at the level of the inframammary sulcus. Bearing in mind that the diameter of a normal areola is about 45 mm, one can calculate the radius of 23 mm superiorly to mark point A. Point B will be the inferior point of the areola, the calculation of which is based on the distance between the lower point of the areola and the inframammary sulcus, around 40 mm for a small breast and about 60 mm for a large breast without ptosis (Fig. 11.7). Once these two points are obtained, it is necessary to trace an ellipsis, which will indicate the area for skin removal.

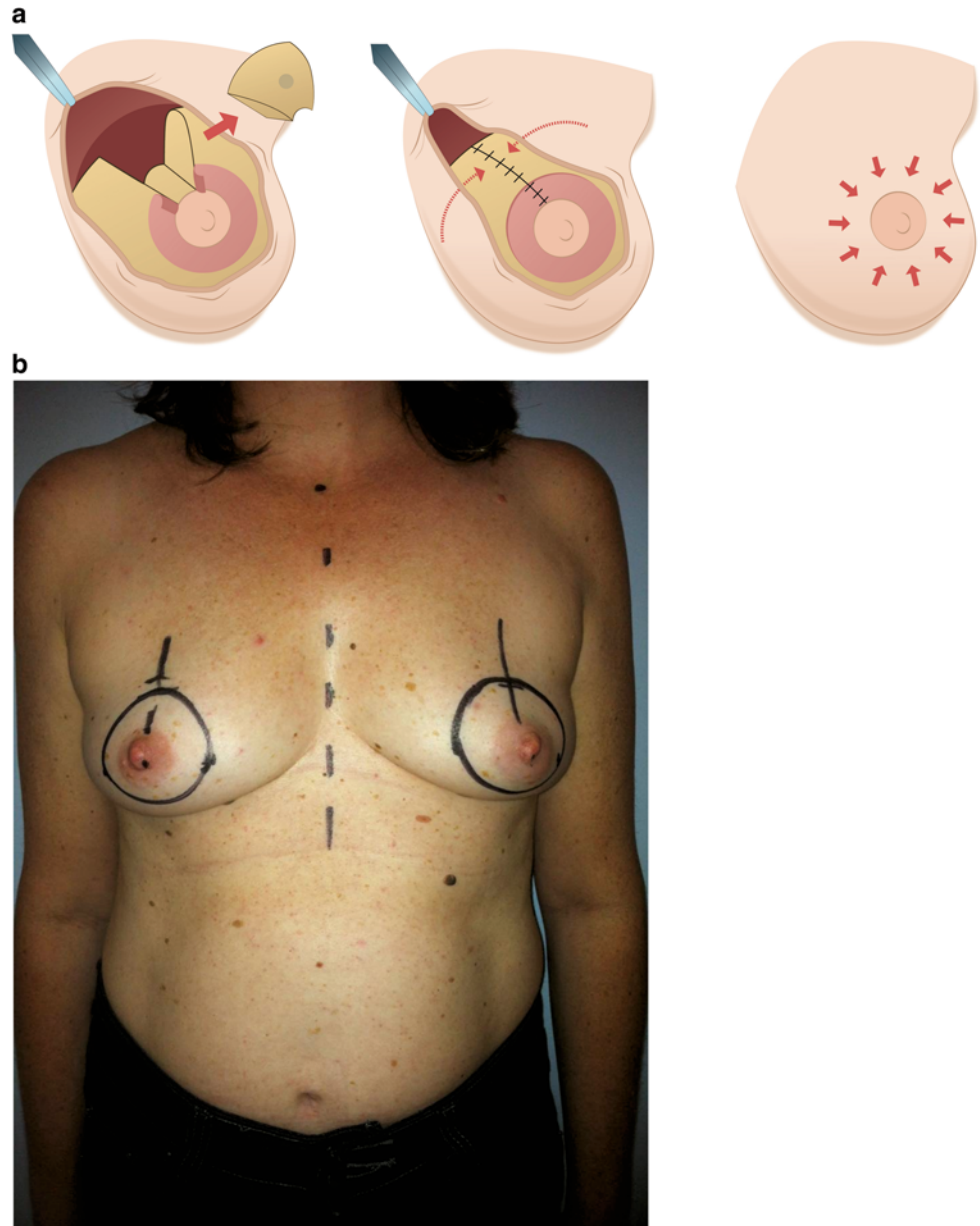
11.4.2.2 Planning for Superior Pedicle Techniques

These techniques are based on superior areolar vascular pedicles such as those proposed by Pitanguy [27] or Lejour [28]. They may be useful in cases of tumors situated in the lower quadrants and are appropriate for large breasts or medium-volume breasts with minimal ptosis. The technique is similar to one used in aesthetic surgical procedures. The upper point of the areola (point A) is calculated as in the preceding technique. Point B can be obtained by drawing an inverted “T” of 5-4-4 cm, which creates an areola whose diameter is approximately 45 mm. The superior drawing is made in a “mosque roof” shape in order to reduce the tension at point B. A vertical pillar design is made through superior-internal and superior-external mobilization of the breast as described by Lejour [28]. The decision on whether to perform only a vertical scar or an inverted “T” scar will depend on the level of hypertrophy and the level of ptosis. For small breasts and those with less ptosis, it is possible to perform only a vertical scar, and for large breasts with major ptosis an inverted “T” scar will avoid the cutaneous excess such as the skin fold produced in the vertical scar. The position of the scar as vertical or an inverted “T” can be central (more frequent), medial, or lateral, according to the location of the tumor and the need for skin removal on the nodule aiming to obtain better surgical radicalization (Fig. 11.8).

11.4.2.3 Planning for Inferior Pedicle Techniques

These techniques are based on inferior-posterior areolar vascular pedicles, as described by Ribeiro et al. [29] and Robbins [30], and they may be applied in cases of tumors situated in the upper quadrants of the breast. The

Fig. 11.7 Plan for the round block technique



preoperative drawing and measurements can be made in the same way as with the Pitanguy and Lejour techniques, with a periareolar scar and an inverted “T”, or a vertical/oblique inferior line. The areolar pedicle is inferior-posterior and should be drawn with an inferior base of at least 6–8 cm. This measurement is important to preserve the posterior vessels located in the lateral edge of the pectoralis major muscle, which penetrate the pedicle (Fig. 11.9).

11.5 Conclusions

It is not exaggerated to state that planning is the most important time in this surgery. There are two fundamental aims in planning oncoplastic surgery :

anticipation of the surgical steps to follow in the operating theater, and reduction of surgical risks. In planning oncoplastic surgery it is essential to anticipate the size and location of future glandular and skin defects, and the relation of the NAC to them. Symmetry is a big challenge in oncoplastic surgery, and it is clear that with good preoperative planning it is possible to achieve better oncologic and aesthetic–functional outcomes. One must also plan how correct possible previous asymmetries too, and to combine this with the oncologic approach. And, of course, the preoperative planning stage is the last time for the surgeon to detect any patient misconceptions about this kind of surgery and its limitations, which are greater than those for aesthetic surgery.

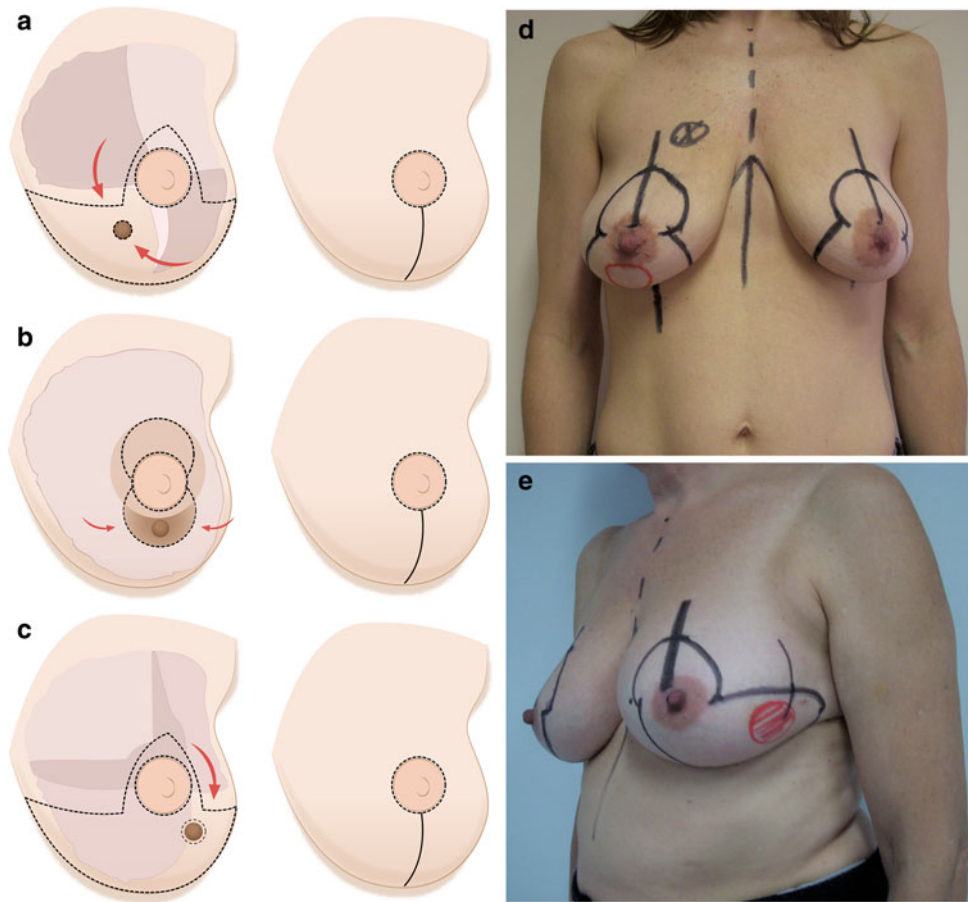


Fig. 11.8 Plan for superior pedicle techniques with tumor in different inferior quadrants

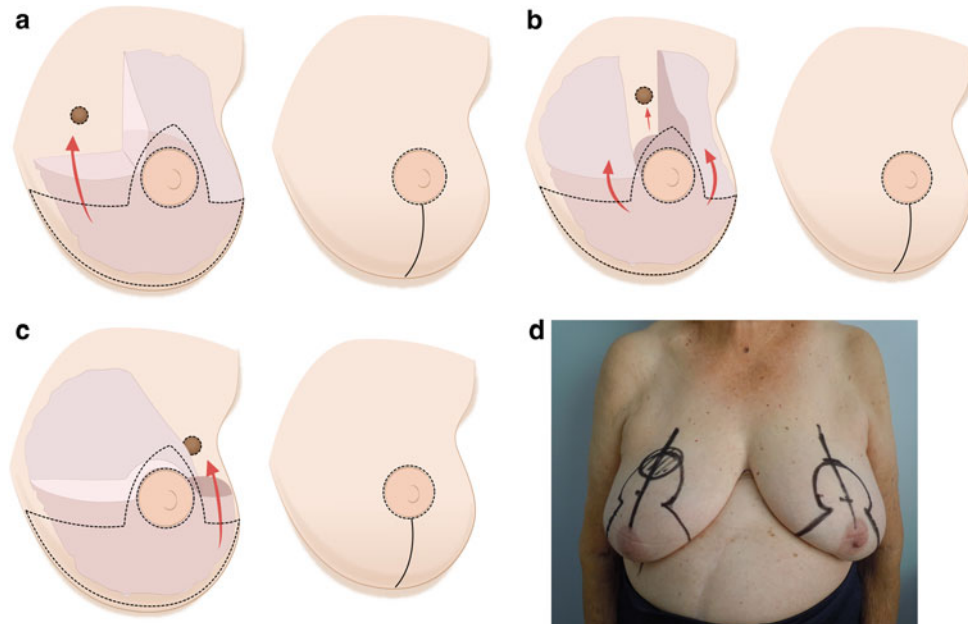


Fig. 11.9 Plan for inferior pedicle techniques with tumor in different superior quadrants

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