Contralateral Breast Management

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38.1 Introduction

Breast reconstructive surgery techniques have increasingly evolved in the last decades both by a surgical and postoperative management point of view.

More and more attention has been paid on the quality of life of patients undergoing this kind of surgery. Nowadays a reconstructive result can be considered worth not only when an acceptable morphology of the reconstructed breast alone is achieved but symmetry with the contralateral breast in terms of volume and shape obtained.

As a consequence, oncoplastic surgeons are paying more and more attention to the management of the contralateral breast. In this chapter the authors will discuss and provide a systematic method to correctly plan and approach this kind of surgery.

38.2 Preoperative Evaluation

Preoperative evaluation is fundamental in order to choose the appropriate surgical technique for remodeling the contralateral breast after breast oncological procedure.

In order to obtain the best symmetry between the two breasts in terms of volume and shape, several features should be considered:

1. Type of oncologic resection.
2. NAC position: any asymmetry between the two NAC must be assessed.
3. Mammary ptosis: true ptosis or pseudoptosis must be discerned; the degree of glandular descent and of skin exceeding and stretching must be evaluated and distinguished in planning the correct mastopexy or reduction mammoplasty technique, when needed.
4. Volume: any difference and asymmetry in mammary volume must be assessed between the two breasts. If the affected breast is bigger than the contralateral one.
5. Breast shape: in particular stenotic and tuberous breast deformities should be recognized and assessed.
6. Symmetry.
7. NAC-inframammary fold distance.
8. Alignment of the NAC along the breast meridian. The NAC can be displaced both laterally and medially.
9. Thickness of the patient's skin. In patients with excessively thin skin, the breast implant contours may be easily visible giving an unpleasant and artificial appearance to the breast and leading to the loss of the natural harmonic breast profile.
10. Thoracic deformity deriving from a variety of conditions as prominent costal bones, sternal anatomical deformities or alterations, and scoliosis.
11. Patient's requests.

1. *Preoperative pictures:* pictures in six projections are made before surgery, as shown in images. To assess the precise position of the mammary crease, the patient is also asked to lift her arms above her head.
2. *Preoperative marking* is made requiring the patient to stand in front of the surgeon, with arms hanging relaxed along the body. A vertical median line is drawn running from the interclavicular junction to the umbilicus. The jugulum to NAC distance is then measured and compared between the two breasts. The areolar perimeter and the inframammary folds are marked. The breast meridians are finally drawn along with the base of the breasts. Mastopexy and reduction mammoplasty markings are modified during surgery when immediate reconstruction is performed, since the

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contralateral breast will be adjusted to the diseased one after its reconstruction. The seatback of the operating table is lifted up to 45° during surgery in order to recreate the gravity effect and correctly adjust the markings. When a two-step reconstruction is performed, markings are made preoperatively, since the final volume and shape of the reconstructed breast are assessable previous to surgery.

The preoperative meeting with the patient is extremely important. During the encounter the goals of the surgical reconstructive procedure are clarified and explained: even if the main aim is to obtain symmetry between the two breasts, the physician must underline that equality between them cannot be guaranteed.

Patients' comorbidities and previous or current therapies must be considered too. Patients with a positive history for neoadjuvant chemotherapy or radiotherapy have an increased surgical risk for local infections and flap necrosis.

In order to correctly consider the entity of the oncologic resection planned for the diseased breast and consequently to correctly choose the technique to apply to the contralateral breast, a multidisciplinary approach is advocated. Thus the patient is evaluated together with the general surgeon previous to surgery.

Further preoperative and intraoperative considerations regarding the different techniques and situations will be discussed in the next sections.

38.3 Surgical Techniques

Depending on the oncological surgical technique employed on the affected breast, different reconstructive surgical techniques can be adopted to remodel the contralateral breast in order to symmetrize and adapt it to the former. A list of the employable techniques is here provided. In the next section, the authors will discuss in which case each technique is suitable and suggested.

38.3.1 Mastopexy

Mastopexy literarily means lifting up of the breast. Classically mastopexy is used to correct breast ptosis, which in turn can be due to a glandular ptosis, skin stretching and excess, or both. Actually by the employment of this technique, not only a lifting of the breast can be achieved but also a replacement of the NAC. Depending on the degree of breast ptosis, amount of breast tissue, and amount of skin excess, three main different mastopexy techniques can be used:

- Periareolar mastopexy: this technique can be used to correct low to medium degrees of mammary skin ptosis. In addition to the correction of a mammary ptosis, the goal in performing this technique is to centralize the NAC above the point of maximum projection of the breast mound and/or symmetrize it to the contralateral when the two NAC are not symmetrically positioned [1]. According to this the markings and consequently the incisions may be eccentric rather than concentric (Fig. 38.1). When a medial NAC repositioning is wanted, the markings and incisions will be elliptical having the major axis of the ellipse horizontal and having the lateral margin of the NAC corresponding to the lateral margin of the ellipse. The longer the major axis of the ellipse, the more the NAC will result medial in respect to the original position. The same method is adopted in order to lateralize, lower, or lift the NAC, accordingly

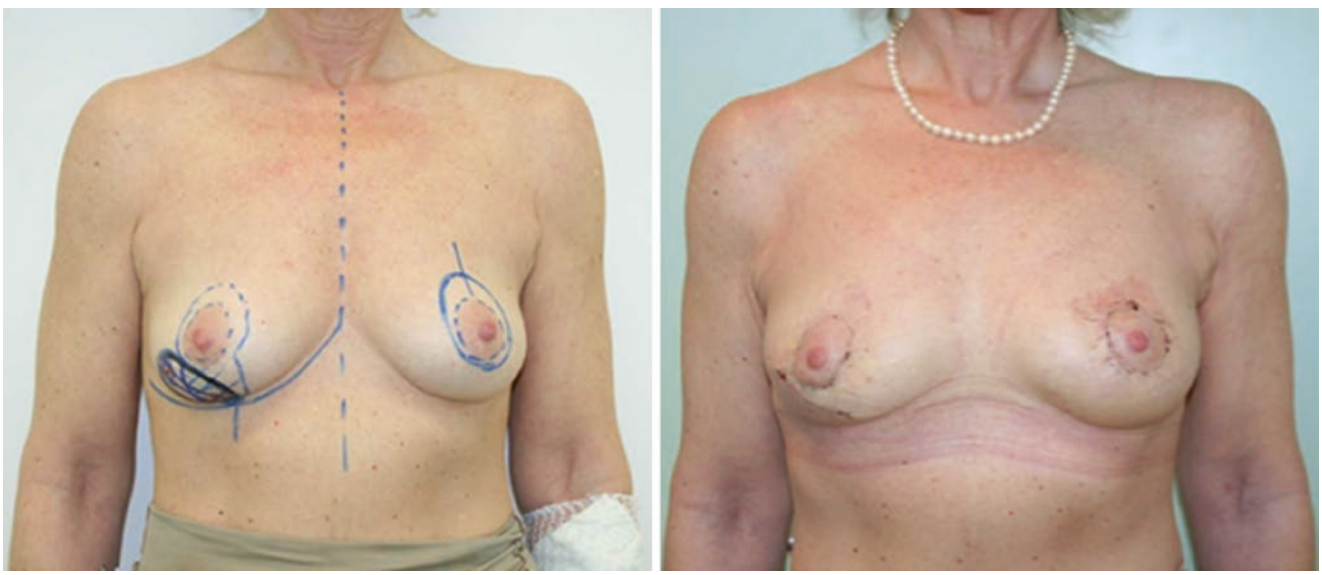

Fig. 38.1 Right breast inferolateral quadrantectomy. Periareolar vertically eccentric mastopexy is planned for contralateral breast management

changing the orientation and major axis of the ellipse. The wider the ellipse drawn, the more the amount of the skin that will be excided. Consequently the size of the ellipse should be increased along with the degree of skin excess.

The surgical incisions will follow the markings made in the preoperative evaluation. After the periareolar skin incision has been done, a second external cutaneous incision is made following the markings. The skin comprehended by the two incisions is then deepithelized. Consequently the dermal layer is incised circumferentially except for a small portion in the cranial part which will function as superior dermal pedicle. Dermal round-block sutures allow to reduce the diameter of the external incisions, thus reducing the skin tension affecting the eventual periareolar sutures. Reabsorbable Vicryl sutures are employed for the gland, and reabsorbable Monocryl intradermic sutures are used for the dermal layer.

- Vertical and inverted T mastopexy
  For medium to high and high degrees of mammary skin ptosis with breast volume and for glandular ptosis, an inverted T approach must be employed.

  Since the markings and techniques employed in performing a vertical or inverted T mastopexy are nearly the same of those employed in performing a vertical or inverted T reduction mammoplasty, these two approaches will be discussed and described in the reduction mammoplasty section.

In order to choose the correct mastopexy technique, the quality of mammary ptosis must be correctly assessed. When a true glandular ptosis is present and the mammary gland is majorly distributed at the lower quadrants, a reversed T mastopexy is usually advocated, allowing to reposition the gland upward and to remove the excess of glandular tissue. When the ptosis is purely glandular, repositioning of the NAC may not be necessary. When the ptosis is mainly due to a skin excess, a periareolar or vertical approach may be sufficient. In this latter case, a descent of the NAC secondary to skin stretching and descent is usually present and its repositioning is needed.

38.3.2 Reduction Mammoplasty

Reduction mammoplasty is employed to correct an excess in glandular volume. Since a variable degree of mammary ptosis and skin excess is always observed in hypertrophic mammary glands, lifting of the gland and excision of exceeding skin are also performed along with the excision of the exceeding glandular tissue. Three main different approaches are employed in reduction mammoplasty: periareolar, vertical, and inverted T approach:

- Periareolar reduction: surgical approach and markings are the same as described in the periareolar mastopexy section. By the use of this technique, small to medium volume reductions can be achieved. As a consequence this approach should be chosen when a smooth volume asymmetry is noted between the two breasts, after cancer excision and affected breast reconstruction. When quadrantectomy is performed, glandular reduction of the contralateral breast can involve the same quadrants as the ones resected in the affected breast or different ones, depending on the patient's preoperative anatomy. Volume symmetrization through this approach can be adopted also after mastectomy and reconstruction with similar indications obtaining good results with minimal scarring (Fig. 38.2).
- Vertical reduction mammoplasty: this technique can be employed when medium degree of glandular hypertrophy or exceeding is observed. Periareolar markings are first made. Secondly, the desired new position of the NAC is assessed: by holding the breast between the thumb and the third finger, the projection of the midpoint of the inframammary fold on the anterior surface of the breast can be marked; this point will indicatively correspond to the cranial margin of the NAC. The markings are consequently made. The two vertical lines connect the extremities of the circle to the midpoint of the inframammary fold. Indicatively the wider the vertical lines, the more will be the skin and glandular excision. The shape of the circle or ellipse allows to modify the quantity of the skin excised in the central and cranial part of the gland and allows to modify the position of the NAC in respect of the mammary mold, similarly to what has been previously described in the periareolar mastopexy section. The cutaneous incisions follow the markings described. The gland is also incised accordingly to the markings. A vascular pedicle cranially to the NAC is maintained and no glandular incision should be made in this region. A variable amount of glandular tissue can be excised in order to reduce the mammary volume. The amount of the skin excised not necessarily corresponds to the amount of gland removed: by increasing the depth of the glandular incision, increased amounts of glandular tissue can be removed. Dermoglandular detachment is usually performed along the margins of the incisions in order to avoid excessive tension on the suture lines. The dermoglandular flaps are eventually approached and sutured [2, 3].
- Inverted T reduction mammoplasty: this technique is usually employed when a medium to high degree of hypertrophy or mammary ptosis is observed. The length of the vertical lines is approximately 5–6 cm. This will be the final length of the NAC-inframammary fold distance. Depending on the degree of ptosis and hypertrophy of the mammary gland observed preoperatively, an upper or

Fig. 38.2 Left breast inferior quadrantectomy. Periareolar vertically eccentric reduction mammoplasty has been performed for contralateral breast volume symmetrization. Breast parenchyma has been removed in the lower quadrants of the right breast in order to balance volume asymmetry, already present before surgery, with minimal scarring

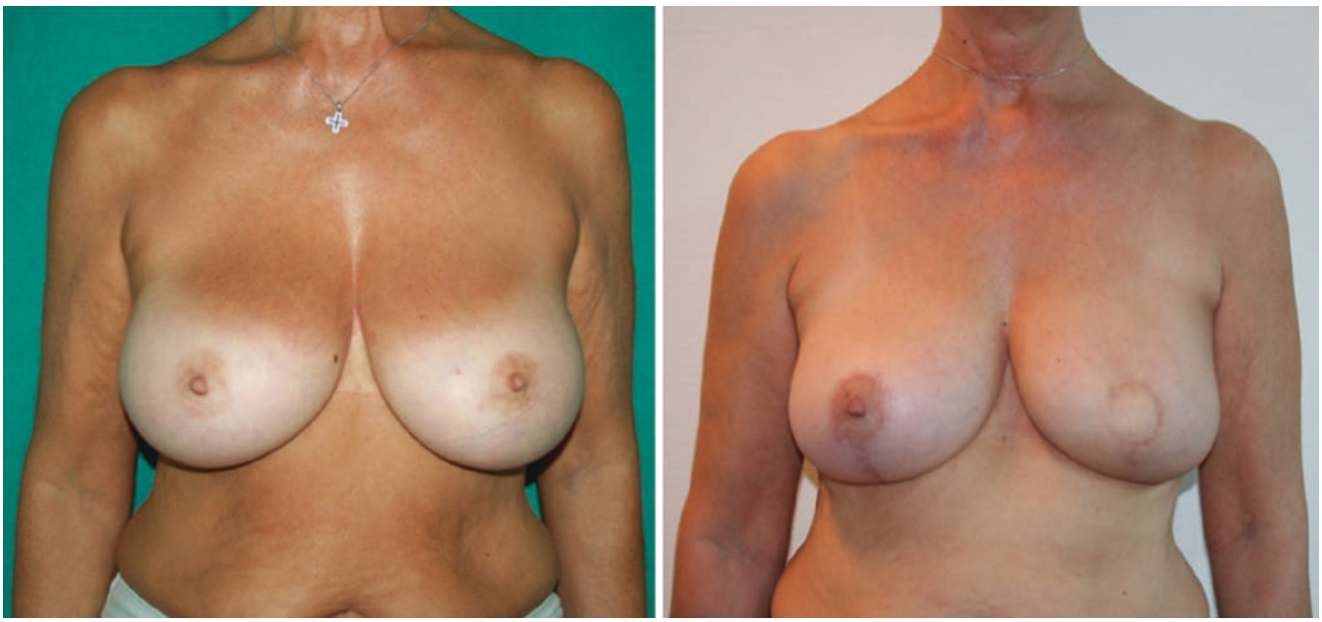

Fig. 38.3 Left breast central quadrantectomy. Inverted T reduction mammoplasty that is adopted has been chosen for contralateral breast volume symmetrization. A lower pedicle is adopted with a glandular excision in the lower quadrants

lower vascular pedicle is chosen. A lower pedicle is usually employed when a severe hypertrophy and degree of ptosis are present. In fact an upper pedicle in these types of breast would be excessively long and would need to be folded several times to allow the repositioning of the NAC cranially, thus increasing the risk of vascular necrosis of the NAC itself. The glandular excision involves mainly the lower quadrants. Comparing to the vertical technique, a wider amount of gland is removed. The glandular tissue remaining after the excision is usually rearranged and lifted: a detachment of the mammary gland from the muscular fascia allows to lift up the glandular tissue and to suspend it cranially by suturing it to the pectoral fascia (Fig. 38.3).

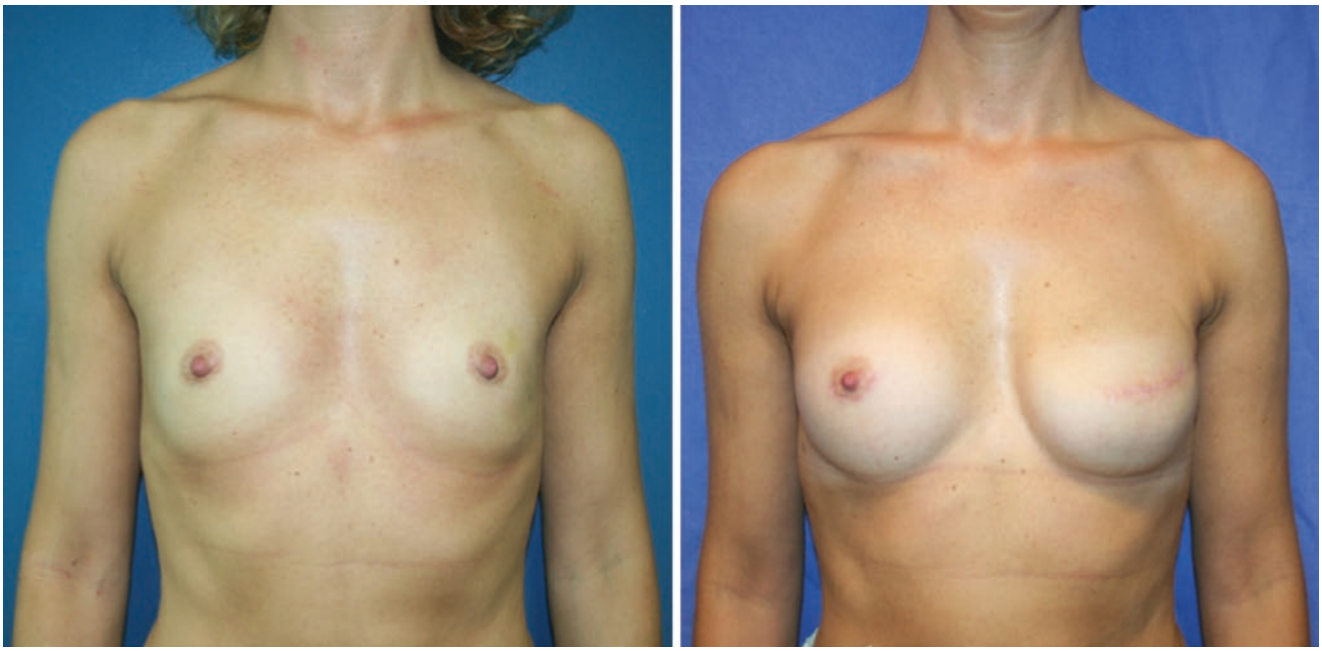

Fig. 38.4 Left breast mastectomy and immediate two-stage breast reconstruction. During stage II breast reconstruction, contralateral symmetrization has been performed with augmentation mammoplasty since unaffected breast was hypoplastic

When a residual excess of dermoglandular tissue is still present alongside the inframammary fold, a further dermoglandular excision can be performed. When an increase in breast projection is aimed, a portion of the lower quadrants' glandular tissue can be undermined and preserved: by flipping inward the resulting glandular flaps (autoprosthesis), the projection of the breast can be significantly increased [4–14].

38.3.3 Augmentation Mammoplasty

Augmentation mammoplasty assumes the use of breast prostheses. The cutaneous incisions can be periareolar or performed at the inframammary fold or axilla. The authors prefer the periareolar approach for several reasons. Firstly, when a periareolar mastopexy is necessary, the same surgical access can be employed for both techniques. Secondly, the scar can be camouflaged corresponding to the limit between the areolar darker skin and the breast lighter skin. Moreover when a modification or definition of the inframammary fold is needed, the periareolar surgical access allows to work on it more comfortably when compared to the inframammary surgical access. The prostheses can be implanted both in the subglandular plane or in the submuscular plane. If no anatomical abnormalities are found and the pectoralis major is normotrophic and integer, a submuscular approach is preferred. The dual plane technique is usually adopted: the pectoralis major muscle is interrupted at two thirds of its length parallel to the muscular fiber to avoid excessive bleeding and postoperative pain. When anatomical conditions are not optimal or the pectoralis muscle is hypotrophic or atrophic, a subglandular approach is preferred. In both the submuscular and subglandular techniques, the pocket is created by digital dissection in order to avoid excessive traumatism to nerves and vessels. The ideal pocket should be large enough to host the new implant without distorting it, being careful not to exceed cranially and medially which would lead, respectively, to riding high and symmastia deformities. A new inframammary crease is needed when the contralateral one is asymmetrical or if the previous mammary fold is aesthetically unpleasant. The new inframammary crease is defined by suturing the lower pole dermal and subcutaneous tissue to the costal perichondrium or to the caudal capsular tissue. Failure in performing this may lead to bottoming out or double-bubble deformities. The pocket is closed with interrupted sutures. A drain is always inserted in the pocket (Fig. 38.4).

38.3.3.1 Contralateral Breast Management in Case of Quadrantectomy

Quadrantectomy means the excision and removal of a part of the mammary gland. The volume and position of the glandular mass removed vary depending on the volume and the position of the tumor.

Quadrantectomy inevitably causes a reduction in the mammary volume of the affected breast leading to an

unavoidable asymmetry between the two breasts, if they are initially equal. Depending on the amount of tumorous and glandular tissue removed, the resulting asymmetry degree will accordingly vary. The location of the cancer and the affected quadrants do not importantly affect the approach on the contralateral breast, being the main variable counting the amount of tissue removed. The breast initial volume also influences the technique chosen to reconstruct both the affected and the contralateral breast.

When the patient's breasts are equal in volume or when the affected breast is smaller than the contralateral one, three main situations can be discerned:

1. A small amount of volume is removed from the affected breast. In this case no intervention on the contralateral breast may be needed. If an asymmetry derives from the excision of the tumor, a periareolar mastopexy is usually sufficient to symmetrize the contralateral breast and NAC.
2. A large amount of volume is removed from the affected breast and the patient's breast is normotrophic or hypertrophic. In this case a reduction mammoplasty and mastopexy are usually employed. If the resulting asymmetry is smooth, a periareolar approach may be sufficient for parenchyma reduction, while when asymmetry is more severe, a vertical or reverse T approach may be needed.
3. A large amount of volume is removed from the affected breast and the patient's breast is hypotrophic. In this case simply remodeling and reshaping the remaining volume on the affected breast do not allow a satisfactory reconstructive result, and a prosthesis implantation is needed to give the affected breast an acceptable morphology. If the affected reconstructed breast appears bigger than the contralateral one, a prosthesis implantation may be needed also in the unaffected side. The prosthesis chosen for the contralateral breast will be smaller than the one employed to reconstruct the diseased breast, since the glandular tissue is entirely preserved in the former. A circumareolar mastopexy is usually employed if a certain degree of ptosis is observed along with breast hypotrophy and in order to symmetrize the NAC.

When the affected breast is bigger than the contralateral one, no intervention on the latter may be needed: the reduction of the diseased breast derived by the quadrantectomy may adjust itself the affected breast to the healthy one. A simple periareolar mastopexy may be needed to symmetrize and reposition the NAC. If a large amount of volume is removed from the affected breast, the three previously reported situations are possible.

When radiotherapy consequent to surgery is necessary and programmed, any intervention on the unaffected breast should be postponed 3–6 months after the end of the radiotherapy cycles. Tissues undergoing radiotherapy may in fact suffer from chronic edema or fibrosis. In the first case, the breast will appear more and more swollen over time; in the latter it will progressively reduce. Thus modifying and adjusting the contralateral breast previous to radiotherapy may result useless and unsuccessful. Only when a great difference is observed between the two breasts after quadrantectomy, surgery is suggested on the contralateral gland.

When breast implants are adopted in reconstructive surgery by the insertion of a prosthesis in the breast undergoing quadrantectomy without a contralateral augmentation mammoplasty for symmetrization, a particular attention should be given. In such cases the aging processes will differ between the two breasts: the breast reconstructed by the implantation of a prosthesis will minimally change over time, while the contralateral one will vary in size, accordingly to the possible weight gain or loss of the patient, and will descend over time. Consequently asymmetry between the two breasts may turn out again over years after reconstruction and further surgery may be needed. The patient must be aware of this aspect, and the physician must clearly explain it at the preoperative encounter and consultation.

38.3.3.2 Contralateral Breast Management in Case of Mastectomy

Mastectomy means the removal of the entire mammary gland in the presence of a tumor. Depending on the different types of mastectomies and on the anatomical characteristics of the patient, two main reconstructive routes can be followed:

- Immediate reconstruction: the affected breast is reconstructed immediately after the oncologic resection by the use of a prosthesis or flaps.
- Two-stage reconstruction: the affected breast's volume is recovered over time by progressive expansions of an expander inserted at the time of the oncological resection. When the expansions are terminated, the expander is eventually replaced by a definitive mammary prosthesis.

When an immediate reconstruction is planned, contralateral breast reconstruction is made at the same time of the affected breast reconstruction. Since a portion of the skin may be removed together with the gland from the diseased breast, it may result smaller and lifted after the reconstruction. Thus a mastopexy and reduction mammoplasty are usually needed for the contralateral breast. Depending on the volume, degree of ptosis, and morphology of the unaffected breast, all the different mastopexy or reduction mammoplasty techniques previously described may be employed. If radiotherapy is to be performed on the affected breast, the reconstruction of the contralateral one should be postponed

3–6 months after the end of the last radiotherapy cycle, in order to appreciate any possible breast swelling or volume reduction.

When a two-stage reconstruction is planned, contralateral breast reconstruction is made at the time of the substitution of the expander with the definitive breast prosthesis. In fact the eventual appearance of the diseased reconstructed breast is not predictable at the time of the expander insertion. If radiotherapy is to be performed, the second stage of the reconstruction should be postponed 3–6 months after the end of the last radiotherapy cycle, in order to appreciate any possible breast swelling or volume reduction in the affected breast, as mentioned in the previous paragraphs. The possible situations at the time of a second stage reconstruction are listed as follows:

- *The contralateral breast has a major degree of ptosis and/or is greater in volume compared to the reconstructed breast:* this represents the commonest situation. Patients undergoing mastectomy are adult women, most of which over 40 years old. Consequently a certain degree of ptosis is generally present. Moreover when a mastectomy is performed, a variable amount of the skin may be excised along with the gland, as described before. As a result the contralateral breast usually proves to have a major volume when compared to the reconstructed one, even after the expansions have been completed. Depending on the severity of mammary ptosis and of the breast hypertrophy, different mastopexy and reduction mammoplasty techniques may be adopted, allowing to reduce and lift up the mammary gland, to excise the possible excess of the skin, and to reposition the NAC correctly.
- *The contralateral breast presents the same degree of ptosis and the same volume of the reconstructed breast:* in these rare situations, no intervention is needed on the contralateral breast. A periareolar mastopexy for minimal asymmetry between the glands or the NAC position may be performed.
- *The contralateral breast is smaller in volume compared to the reconstructed breast:* this may happen especially when a skin- or nipple-sparing mastectomy is performed, allowing a major expansion volume. The contralateral breast may be hypotrophic or atrophic. It may be or not be descended. This represents an extremely rare circumstance. In such case the implant of a prosthesis in the contralateral breast, along with a mastopexy (if necessary), is needed. As described in the quadrantectomy section, the prosthesis employed will be smaller than the one used to reconstruct the affected breast, since the mammary gland is spared in the contralateral breast and contributes to its final volume.

The previous consideration about aging processes in contralateral breast should be made for patients undergoing mastectomy breast implant reconstruction without a contralateral augmentation mammoplasty for symmetrization. In fact in these cases, which are the more frequent, the two breasts will differ over time. The breast reconstructed by the implantation of a prosthesis will minimally change over time, while the contralateral one will vary in size, accordingly to the possible weight gain or loss of the patient, and will descend over time. Consequently asymmetry between the two breasts may turn out again over years after reconstruction and further surgery may be needed. The patient must be aware of this aspect, and the physician must clearly explain it at the preoperative encounter and consultation.

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