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Brief Insight about Techniques of Oncoplastic Breast Surgery

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Abstract: Breast Conserving Surgery (BCS) has gradually substituted mastectomy in the treatment of early-stage tumors. Indeed it ensures the same overall survival and better aesthetic results when followed post-operative radiotherapy. Nevertheless more than 20% excision of breast tissue, retro-areolar or lower pole cancer, and higer-sized breasts with ptosis, tend to result in aesthetically unpleasant results. Oncoplastic breast surgery finds its route into breast conserving surgery in the attempt to improve the aesthetic results while not compromising the oncologic ones.

Keywords: *Oncoplastic Breast Surgery*

Introduction.

When it comes to treating early-stage cancers, Breast Conserving Surgery (BCS) has been progressively replacing mastectomy. When used in conjunction with radiation therapy, it guarantees patients an improved cosmetic outcome while maintaining an acceptable risk of local recurrence and overall survival [1]. To minimize tissue removal, ensure total cancer eradication, and maintain breast shape, quadrantectomy is commonly used in BCS [2].

A more conservative approach with reduced glandular resection and a skin excision pattern oriented along the lines of tension has evolved from the original quadrantectomy described by Veronesi, which involved removing a large portion of skin and glandular parenchyma, to a method described by Langer and Kraissl [3, 4]. Certain cancer sites (lower quadrant, upper pole, retroareolar quadrant) do not yield cosmetically acceptable results when using the usual approach. Furthermore, a major predictor of the incidence of breast deformities is the volume of removed glandular parenchyma [5]. As a matter of fact, cases where more than 20% of the gland is destroyed are associated with a considerable risk of malformation [6]. Oncoplastic procedures include extensive lumpectomy followed by tissue filler injections using various plastic surgery techniques for these patients. Increasing the number of cases where conservative therapy is appropriate and enhancing the cosmetic results are the primary objectives.

2. Coronal Angioplasty

"Oncoplastic" originally meant "shaping the tumor" and was used by Gabka et al. [7] to characterize cosmetic surgery procedures that broadened the scope of conservative breast cancer treatment. Oncoplastic breast surgery (OBS) should be conducted at the same time as oncological excision in order to achieve extensively excised, clear margins without sacrificing the cosmetic outcome, as confirmed at the 2006 Milanese Consensus Conference on Breast Conservation [8]. These methods have seen a rise in popularity in recent years, thanks to advancements in our understanding of the appropriate breast size and the prevalence of preoperative breast reconstruction planning software, which includes digital operation simulations [9–11].

3. Considerations Prior to Surgery

Before undergoing conservative oncoplastic surgery, it is important to assess various factors. These include the amount of the mammary gland that needs to be removed, the location of the tumor, the breast's size and density (a dense breast is safer to mobilize because it contains less fat), the presence and severity of ptosis, and the patient's personal risk factors, such as obesity, smoking, diabetes, and previous radiation or chemotherapy. People with inflammatory cancer, significant malignant microcalcifications, T4 tumors, or multicentric disease are not good candidates for BCS. For these patients, the best course of action is a straightforward mastectomy, with either immediate or delayed reconstruction using tissue expansion [12, 13].

Clough et al. [14] state that the best surgical approach can be determined using a two-tiered classification system that takes into account the volume of removed tissue and the location of the cancer. For tissue removal rates below 20%, the level I approach is recommended. A skin incision is made, the nipple-areolar complex (NAC) is detached, a full thickness excision is performed, the defect is closed by simply approximating the margins, and the nipple areola complex is centralized if necessary [15]. Subsequent glandular reshaping and cancer removal are made easier with this technique. In order to get the so-called hard-quadrant, we need to select a breast that is either very large with significant ptosis or has a removed tissue volume of more than 20%.

method II. Varieties of oncoplastic procedures define II. Fig. (1a, b, c) The surgically excised breast will differ from the contralateral one in relation to the volume. Hence, it is important to think about and talk about whether contralateral symmetrization is needed immediately or postponed before surgery [16].

SURGERY METHOD

In order to fill surgical deficiencies, these procedures are commonly referred to as volume displacement. They involve mobilizing and transposing local glandular (dermoglandular) flaps. The only difference between Type I and Type II is the amount of breast tissue that needs to be removed. Both types involve displacing some amount of remaining glandular parenchyma. To make things easier to understand, we will break the breast down into four sections and go over the unique oncoplastic requirements for cancer in each section.

5-7 O' CLOCK, LOWER QUADRANT

Major abnormalities, such as skin retraction or the nipple areola complex bending down, are more likely to occur in this quadrant, according to multiple studies [17–19]. By utilizing a superior pedicle mammoplasty, oncoplastic surgeons can enhance the final contour of the breasts while removing a substantial quantity of tissue from the lower pole without displacing the nipple areola complex. Inverted T-and periareolar scars are the outcomes of this method [14]. The de-epithelialization of the region surrounding the nipple-areola complex is the first step in the surgical procedure. A superior dermoglandular pedicle separates the nipple areola complex from the breast tissue underneath. Following the completion of the inframammary incision, extensive pectoralis fascia-based breast tissue undermining follows. As it surrounds the medial and lateral breasts and the nipple-areola complex, undermining begins inferiorly and moves superiorly beneath the tumor. The margin of normal breast tissue and underlying skin is generously preserved throughout the removal of the cancer, as confirmed by the preoperative drawings. In order to repair the nipple areola complex and replace the defect after resection, the two medial and lateral glandular columns are positioned midline and opposed to each other [14, 20]. One alternative to this method that Lejour and Lassus detailed was vertical-scar mammoplasty, which does not leave a submammary scar [21, 22].

Furthermore, a variation of this method was suggested by Santanelli et al. [23] for the excision of external-interior pendent quadrant dependent malignancies.

7-9 o'clock, the inferior-internal quadrant

A V-mammoplasty, which involves slicing the mammary gland in a pyramidal shape with its base in the medial part of the inframammary layer and its peak at the areola, can be helpful in these situations. This method involves removing a large chunk of skin from the lower inner quadrant all at once. Medial advancement of the residual lower quadrants, following complete undermining of the lower pole and cutting of the submammary fold, reshapes the remaining mammary gland. The incisions made during this mammoplasty create a V shape, and a periareolar scar adds to it [14, 24].

7. FROM 10 AM TO 11 AM, THE UPPER-INNER QUADRANT

Significant changes to the decollete may result after a BCS that removes a lot of tissue. Using a preoperative type batwing design, Silverstein et al. [25] outlined a surgical approach that enables the excision of vast regions from this quadrant. Batwing mammoplasty is characterized by the presence of three distinct patches of skin and glands: one in the middle, shaped like a crescent, and two on either side of the nipple-areola complex, forming triangles or wings. A batwing-shaped incision is made on the skin to encircle the skin above the breast tumor in order to execute this surgical method. It is recommended that the lower portion of the drawing follows the higher portion of the areolar border. The new border between the upper and lower jaws will be the upper central margin of the incision made by the batwing. In order to fill the hole, the glandular tissues that are located both above and below the resection cavity are brought forward at the same time [26].

11:00 AM UPPER QUADRANTS / 12:00 PM UPSTAIRS-PARACENTRAL QUADRANTS

It is recommended to increase the lower stalk using preoperative sketching or engraving in accordance with Wise pattern excision in order to surgically access these quadrants. Preoperative drawings for this method are identical to those for the superior pedicle mammoplasty. The top pole is where the incision is made. In order to redistribute volume, the inferior pedicle is de-epithelialized and moved upwards towards the excision defect. In order to achieve the best possible breast silhouette, complementary resection is done in the lower quadrants, both within and outside [14] Figs. (two to nine). Benelli [27] explains that round block mammoplasty is another option, however it leaves a periareolar scar. The procedure is straightforward and consists of making two circular incisions around the areola, then de-epithelializing the skin between the incisions, and finally removing the tumor. Lastly, skin synthesis and medial and lateral glandular flaps are used to reconstruct the gland.

4-5 O'CLOCK, FROM THE BOTTOM TO THE TOP

A J-mammoplasty is the best way to tackle this area. A letter "J" is formed by excising the mammary gland and repositioning the nipple areola complex in accordance with the preoperative plan for de-epithelialization of the upper stalk. In order to cover up the damage, the remaining parts of the central and lateral glands are brought in [28].

QUADRANTS DEPARTMENT

The next step is to remove the tumor-affected breast parenchyma and NAC. Follow the steps for level I if the patient's breast type is glandular and permits a large dissection. Alternatively, we use cutting-edge methods using round-block reconstruction or a Grisotti flap if the breast is mostly adipose tissue or if the amount of tissue removed is more than 20% of the entire volume [29, 30]. Using the hemibatwing method suggested by Pasta et al. [31] is one intriguing option. An area of NAC and gland in the shape of a crescent is removed, and then an area overlying the surrounding skin and gland that extends to one side of the areola is removed in the shape of a triangle or wing. The procedure begins with a lateral incision that extends from the upper semicircular periareolar incision all the way to the axilla. The incision is made halfway around the NAC circumference and then continued to the inferior edge of the areola, starting from the superior-medial side of the areola. Lastly, the extent of the incision is determined by the location of the lesion and then expanded linearly onto the lateral exterior quadrant.

THE SECOND STEP

Oncoplastic breast surgery procedures can be enhanced by Nipple-Areola-Complex (NAC) reconstruction or Autologous Fat Grafting (AFG) to improve the cosmetic outcome after the procedure. If the NAC must be removed along with the breast cancer, there are many local flaps that can be used to reconstruct it. This procedure can begin as early as the second month after surgery. However, you will need to wait another six weeks after NAC reconstruction before getting a tattoo of your NAC [32].

The use of AFG can reduce residual contour abnormalities and asymmetry with the contralateral breast [33]. Because it comes from the same patient, autologous fat transplant is the best filler [34]. In addition to improving the skin's texture, scars, and any late chronic degenerative side effects of radiation therapy, its function goes beyond just filling defects [35]. With the presence of Adipose-derived Stem Cells (ASCs), AFG is able to regenerate and treat several diseases:

a group of mesenchymal stem cells with the potential to differentiate into many cell types, attach to culture surfaces with plasticity, retain their multipotency when expanded in vitro, and even self-renew [36-41]. Mechanical or enzymatic methods can be used to extract ASCs from harvested adipose tissue, which can then be grafted with processed lipoaspirates [42-46]. In addition to secreting paracrine substances, ASCs have the ability to differentiate into other cell lineages;

improving wound healing and angiogenesis, which in turn increases the survival rate of fat grafts and promotes the regeneration of dermal and subcutaneous tissues [34, 42, 47–49].

Additionally, contralateral matching procedures can be done during oncoplastic surgery or at any point the patient feels the need for them [12]. Any breast surgeon worth their salt should have no trouble becoming proficient in mastopexy, reduction mastoplasties, and augmentation mastoplasties. Although these procedures can increase the risk of complications such as seroma, infection, suture dehiscence, flap necrosis, implant exposures, and asymmetry, they can also improve the cosmetic outcome and lessen the psychological impact of oncologic breast surgeries on women [6, 7, 25, 50]. Thus, to lessen the sensation of mutilation, it is routinely recommended and executed during oncoplastic surgery to do contralateral matching procedures.

13. THE DANGERS OF ONCOLASTIC BRAMPER OPTIONS

The complication rate with oncoplastic surgery approaches is approximately 16% [50], according to a recent research published by Losken et al. It is possible to classify complications into two categories. Delays in healing, hematomas, seromas, abscesses, skin, or NAC necrosis are examples of the so-called early problems. The second set of symptoms is associated with long-term consequences, such as scar fibrosis, keloids, and steatonecrosis [51]. The mobilization of large quantities of tissue mostly causes necrosis of the glandular breast tissue, which is a serious consequence. When the gland/adipose tissue rate is poor and the breasts need to be significantly separated from the underlying muscle floor, this might occur, particularly in large-sized breasts. It might get worse if the necrotic areas get infected again; this would raise the risk of postoperative morbidity and postpone adjuvant cancer treatments. To reduce the likelihood of these consequences, antibiotic prophylaxis should be administered before surgery and, depending on the patient's condition, may be continued the day after [52]. Additionally, new computer technologies can improve preoperative planning [53]. Because each of the individual risk factors—obesity, smoking, diabetes, thyroid disorders, and hypertension—is known to play a substantial role in the development of complications after surgery, a reasonable strategy is required to allow surgeons to take preventative measures on these conditions [54-56].

Cancer Prevention

Several studies have confirmed that adjuvant radiation therapy significantly reduces local recurrence and has superior oncological results than surgery alone, therefore it is required regardless of the surgical technique utilized [57].

Oncoplastic breast-conserving surgery has a higher risk of complications, according to a meta-analysis of research, but this does not affect the timing of adjuvant therapy or oncological outcomes [58]. Evidence suggests that oncoplastic procedures not only improve surgical outcomes, but also radiation therapy planning. Furthermore, compared to patients treated with conventional methods, those who undergo breast reduction procedures actually need lower radiation doses [59-61].

In summary,

From this, we can deduce that oncoplastic breast surgery is an essential component of the interdisciplinary strategy for treating breast cancer. Yes, it is possible to safely remove a lot of breast tissue without worrying about the aesthetics. In addition to lowering the need for re-excision and mastectomy and increasing patient satisfaction, this approach ensures oncological safety. The potential drawbacks include lengthy operating periods and the necessity to frequently operate on the opposite breast to attain adequate bilateral symmetry.

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