

The evolution of mastectomies in the oncoplastic breast surgery era

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Abstract: Over time, surgical techniques have advanced to the point where oncological safety and aesthetic outcomes are the pillars of contemporary breast surgery. Variations of mastectomy came up and started allowing the oncological safety and the possibility of an immediate breast reconstruction. Nowadays the association between plastic surgical techniques and mastectomy with immediate breast reconstruction is one of the best alternatives to treat breast cancer and also improved overall aesthetic outcomes and favors the achievement of contralateral breast symmetry. “Oncoplastic mastectomy” is a feasible term and can be routinely used.

Key Words: Breast cancer; breast conserving treatment; reconstructive surgical procedure; mastectomy; mammoplasty



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Introduction

Over time, surgical techniques have advanced to the point where oncological safety and aesthetic outcomes are the pillars of contemporary breast surgery. Although can a mastectomy be considered an oncoplastic surgical procedure? Can this procedure be called “oncoplastic mastectomy”? Can it be included in the arsenal against breast cancer? To answer those questions it is important to understand part of the evolution of breast cancer surgical treatment.

The partial evolution of treatment

Oncoplastic surgery

By the early 90's Audretsch (1) suggested the integration of plastic surgery techniques with breast-conserving treatment (BCT) for breast cancer. Conceptually, this approach was referred as “oncoplastic surgery”, which aims at providing safe oncologic treatment through careful pre-

operative planning and the incorporation of plastic surgery techniques in order to obtain good oncologic control with favorable cosmetic results in cases of large breast volume and large tumors. Subsequently the concept was accorded the term tumour specific immediate reconstruction. Moreover, oncoplastic surgery very often offers improved overall aesthetic outcomes and favors the achievement of contralateral breast symmetry (2).

The american plastic surgeon John Bostwick III in 1996, suggested that the term Oncoplastic Breast Surgery (OBS) includes not only techniques preventing the consequences of conservative treatment but also a whole range of techniques involving partial or total immediate post-mastectomy reconstruction (immediate breast reconstruction), correction of their consequences (delayed breast reconstruction), and immediate repair of the surgical treatment of locally advanced tumours and recurrences in the chest wall. Nowadays, following a period of uncertainty in the nomenclature, the term OBS is uniformly associated in the medical community with the classification system of

Table 1 Bostwick III classification for oncoplastic breast surgery (3)

Post-mastectomy breast reconstruction (I) Immediate breast reconstruction. This is done when the tumor is resected. Depending on whether the skin of the breast or the nipple-areola complex (NAC) is resected, IBM may be classified in turn as: (i) Conventional or no skin sparing mastectomy, when the cutaneous layer is resected without leaving excessive breast skin behind; (ii) Skin sparing mastectomy (SSM), when as much of the cutaneous layer as possible and the sub-mammary fold are preserved, but with resection of the NAC and prior biopsy incisions and/or diagnostic percutaneous biopsy scarring; SSM may in turn be subdivided into five groups: (a) Periareolar or lozenge resection of the NAC, sparing the skin of the breast; (b) Resection of the NAC with a medial or lateral extension resecting previous biopsy scarring; (c) Periareolar resection of the NAC and separate incision resecting previous biopsy scarring; (d) Border lozenge resection of skin including the NAC, in an attempt to reduce ptosis (indicated for ptotic and hypertrophic breasts); (e) Resection of the skin and NAC in an inverted T shape (ptotic and hypertrophic breasts). (iii) Skin and areola sparing mastectomy (ASM), when the entire cutaneous cover, areola, and sub-mammary fold preserved, but the nipple and incision from previous biopsies and/or scarring from diagnostic percutaneous biopsies are resected; (iv) Nipple sparing mastectomy (NSM), when the entire cutaneous layer, areola, nipple, and sub-mammary fold are preserved, as well as incisions from previous biopsies and/or scarring from diagnostic percutaneous biopsies (II) Delayed breast reconstruction. The period of time in which is done varies after the mastectomy;
Conservative post-surgery reconstruction (III) Immediate breast reconstruction. This is done at the time of the partial tumour resection from the breast to prevent the consequences of resection and of subsequent radiotherapy; (IV) Delayed breast reconstruction. The period of time in which is done varies after the conservative treatment to correct the consequences of surgery and radiotherapy
Reconstruction of defects in the chest wall and in soft tissues, secondary to surgical treatment of locally advanced breast cancer and of extensive local recurrences

John Bostwick III (*Table 1*), in both Latin and Anglo-Saxon publications (3). It is important to clarify that the term OBS also encompasses the techniques developed for preventive surgery in high-risk patients (risk reduction mastectomies).

Skin sparing mastectomy

Down this same path, the mastectomy has changed and Toth & Lappert (4) described the Skin Sparing Mastectomy technique (SSM) in association with the removal of malignant tumors. It allowed the conservation of a large part of the skin and mammary fold in favor of immediate breast reconstruction (IBR).

Carlson *et al.* (5) considered four different types of incisions for SSM (*Figure 1*). The incision type IV is an example of using a plastic surgery technique to perform mastectomy. It is called Wise-pattern skin sparing mastectomy (WPM) which enabled excellent results as IBR in heavy and pendulous-breasted patients who

require a conspicuous reduction of the skin envelope and a contralateral reduction or mastopexy. However, the side undergoing the WPM, the skin flaps are thin and wound healing problems are well described, particularly skin necrosis at the "T" as frequent as 27%, predisposing to prosthesis exposure and therefore limiting its utility. Thus, Nava *et al.* (6) described a modification of this last type of skin-sparing mastectomy, that he called skin-reducing mastectomy. In that case the mammary reconstruction in selected patients is performed in a single-stage in which an anatomical silicone gel implant is placed in a dermal muscle flap pocket. It also allows the achievement of contralateral breast symmetry (*Figures 2,3*).

Nipple sparing mastectomy (NSM)

Other variations of mastectomy came up and started allowing the oncological safety and the possibility of an IBR. Defending the idea of IBR performed by breast surgeons



Figure 1 Skin sparing mastectomy: types of incisions



Figure 2 Preoperative drawings for an "oncoplastic mastectomy"

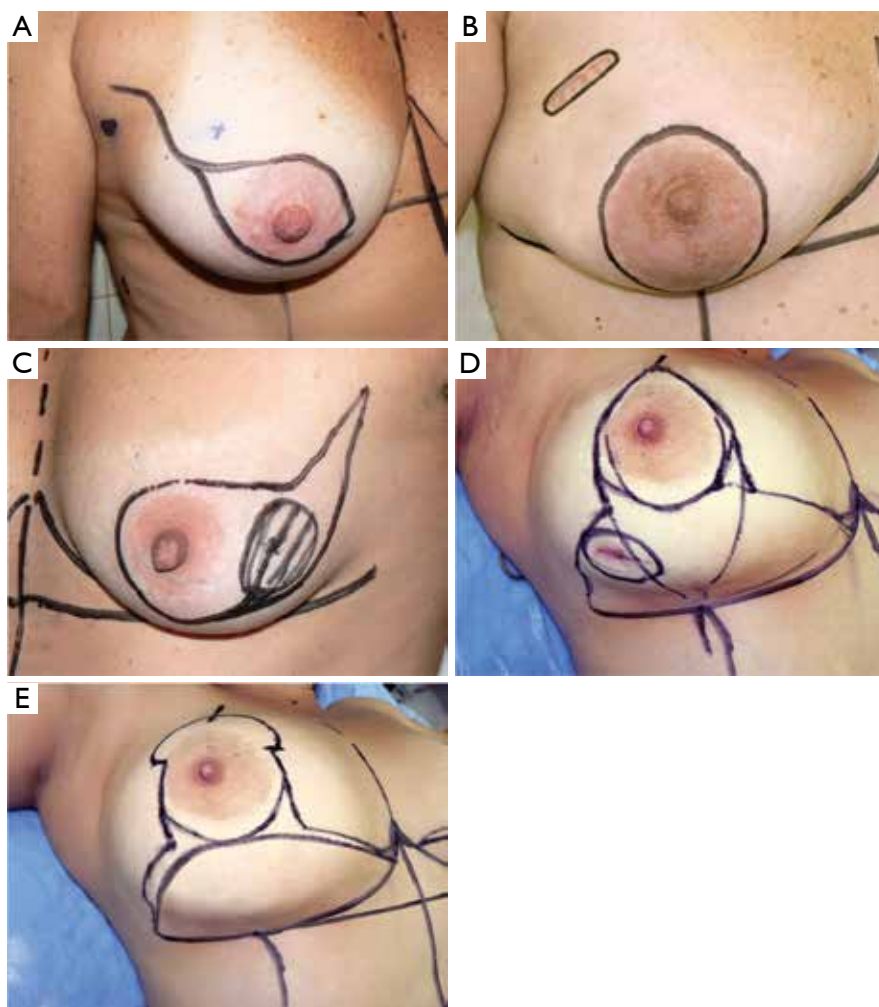


Figure 3 Post operative "oncoplastic mastectomy": skin-sparing mastectomy and immediate symmetrization

trained in oncoplastic surgery or by dedicated teams of breast surgeons and reconstructive surgeons, Petit *et al.* (7), described the nipple-sparing mastectomy as an option for patients with small invasive and non-invasive cancer located far from the nipple-areola complex. The principle of complete removal of breast gland with preservation of skin and also nipple-areola complex was maintained. At the beginning it was indicated in small breast women with multicentric disease, extensive intraductal carcinoma and especially when there was an unfavorable relation between breast volume and tumor size and also for women at high risk.

Risk-reducing mastectomy (RRM)

It is important to mention the prophylactic mastectomy or RRM responsible for sparing the most part of skin and nipple areola-complex but it is indicated for benign treatment or for reducing cancer risk. It has been largely performed for patients displaying the following oncologic risk factors: a positive family history, BRCA-1 and -2 gene mutation, atypic ductal hyperplasia, intensive lobular carcinoma in situ, and ductal carcinoma in situ and still when an extreme fear of breast cancer is manifested. RRM has been performed increasingly due to either patient demand or oncologic surgeon proposal. Sparing of the nipple-areola complex is extremely important for aesthetic results and patient satisfaction in both early-stage breast cancer and high-risk groups.

Conservative mastectomy

Nowadays the principle of oncoplastic surgery is amplified and was incorporated to the idea of an IBR. Recently Veronesi *et al.* (8) published the term conservative surgery regarding a surgical technique demanding on an oncological treatment by removing the breast parenchyma and trying to spare as much skin envelope as possible, including nipple areolar complex. In other words to remove breast glandular tissue without disruption of the breast appearance. It allows an IBR and the contralateral symmetric approach. It also boosts the patient's self-esteem and quality of life.

Conclusions

There are no doubts that mastectomy remains the most common choice of treatment for breast cancer around the world. More often the patients, especially young women,

are looking for a safety oncological treatment warranted by the benefits of breast reconstruction. The breast surgical procedures were updated and the mastectomy too. Those modalities of mastectomy are safe techniques providing better cosmetic outcome without compromising oncological safety as per the current evidence (9). They have allowed the approach of large tumors with an IBR something regarded as unthinkable in the past (10). Moreover the recent literature showed that IBR is a feasible and safe option for women undergoing mastectomies for their breast cancer (9). Today it is important to individualize each case, listen to the patient, clarify her doubts and try to provide the best option for each situation. It is also important to explain the risks of complications and delays to adjuvant therapy. Although radiotherapy does not represent a contraindication to IBR there is no consensus about the adjuvant treatment.

In short, the mastectomy with IBR is one of the best alternatives to treat breast cancer and also the most suitable solution to the relevant points of body image if well indicated. This manuscript does not defend the indiscriminate use of mastectomy but the idea to create and use the term "oncoplastic mastectomy" to the different kinds of sparing mastectomies. It can definitely be used as an evolutionary weapon against breast cancer.

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