ARTIGO ORIGINAL

Conservative mastectomy: a promising technique

Mastectomia conservadora: uma técnica promissora

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Keywords
Mastectomy
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ABSTRACT

The presence of the nipple is known to improve the body image and patient satisfaction. Conservative mastectomy is an emerging technique that couples oncological safety and cosmesis by entirely removing the breast parenchyma sparing the breast skin and nipple-areola complex (NAC). At European Institute of Oncology (IEO) we starting performing this technique in 2002 and so far we have treated 2,487 patients. We present our experience with the technique.

Descritores
Mastectomia
Neoplasias da mama

RESUMO

A presença do complexo areolo papilar (CAP) contribui para uma melhor autoimagem corporal e para satisfação pessoal das pacientes. A mastectomia nipple sparing, que consiste na remoção de todo o parênquima mamário, conservando-se a pele da mama e o CAP; essa é uma técnica inovadora que surge para satisfazer aspectos cosméticos sem prejuízo oncológico. No Instituto Europeu de Oncologia (IEO), iniciamos a aplicação dessa técnica em 2002, tratando até o momento 2.487 pacientes. Apresentamos, pois, nossa experiência com a técnica.

Introduction

The evolution of breast surgery has been impressive during the past 50 years. The passage from aggressive and mutilating interventions, like radical mastectomy, to conservative treatments has been long, but constant, despite the controversies that appeared every time a new procedure came to light. Nowadays, the aesthetic satisfaction of breast cancer patients coupled with the oncological safety is the goal of the modern breast surgeon. In this context, a new surgical procedure emerged called "conservative mastectomy". Although it may sound as a paradox, conservative mastectomy incorporates the advantage of the total glandular excision, offered by the traditional total mastectomy, with the satisfactory aesthetic result, offered by the conservation of the skin envelope and the nipple areola complex. The use of expanders or fixed volume implants ensures a high quality reconstruction that leaves the patient with a new normal looking breast.

At a first glance, conservative mastectomy may look similar to the already known subcutaneous mastectomy, which was first described by Freeman and is being used for risk reduction[1]. However, there are two significant differences; the thickness of the skin flaps and the presence of the retroareolar tissue. Being a curative procedure, conservative mastectomy

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encompasses entirely all the breast parenchyma sparing only the skin with the nipple-areola complex (NAC) (Figure 1). As a result, NAC ischemia and necrosis are some of the complications reported; nevertheless, their treatment is technically easy and without devastating consequences. The point of debate is the oncological safety of the technique, as it has been recently introduced, and long follow-up, as well as randomized trials, are still lacking. The information on conservative mastectomy comes mainly from cohort studies in the international literature that demonstrate high heterogeneity with regards to the indications and the reconstruction techniques[2-6].

The European Institute of Oncology experience

At the European Institute of Oncology in Milan, between March 2002 and December 2011, 2,487 patients were treated with conservative mastectomy. Inclusion criteria were unifocal or multifocal tumors measuring less than 4 cm in diameter and NAC-tumor distance longer than 2 cm. Paget disease, nipple retraction and discharge, inflammatory cancer and previous radiotherapy were exclusion criteria.

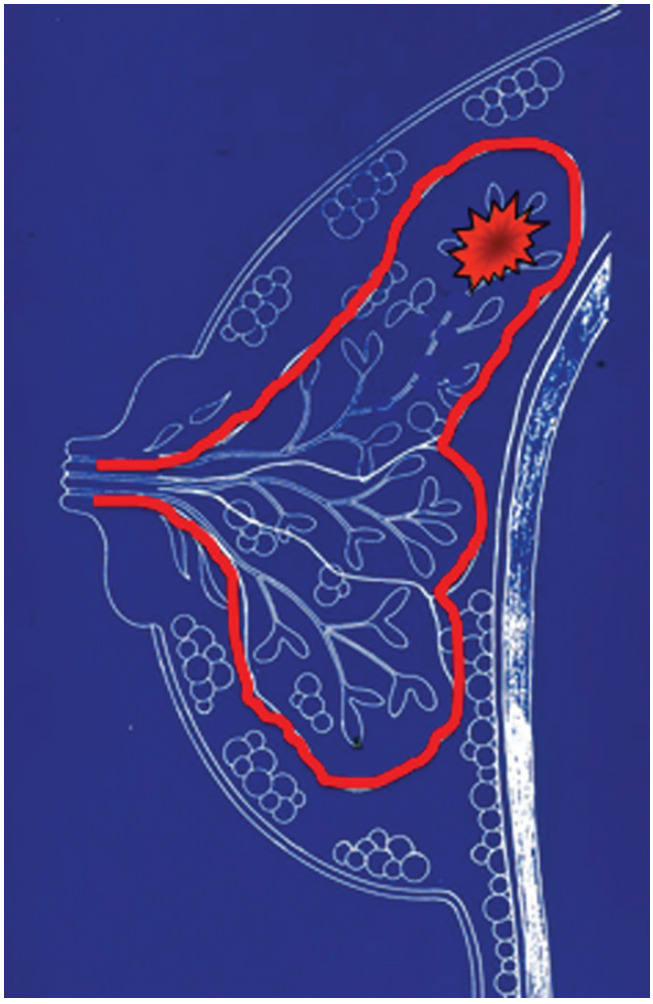

Figure 1. Extend of glandular excision in conservative mastectomy

The preoperative evaluation included digital mammography and breast ultrasound scan. Breast Magnetic resonance imaging (MRI) was not advised routinely. Consultation with the breast and plastic surgeon followed, in order to evaluate the feasibility of the technique and to select the most appropriate reconstruction option.

Technical aspects

The skin incision in conservative mastectomy (CM) can be placed around the areola, with or without lateral extension, on the submammary fold, or at the upper outer quadrant of the breast in a radial fashion[7,8]. We prefer the last option, as periareolar incisions have a high risk for necrosis. Furthermore, the lateral radial incision facilitates the access to the axilla for the performance of the sentinel lymph node biopsy, which is mandatory in all breast cancer cases for the staging of the axilla. If a subsequent axillary dissection needs to be performed, the lateral incision can easily be extended to achieve better access to the higher levels of the axilla, without affecting the aesthetic outcome. Skin flaps are dissected following the cleavage plane in the subcutaneous fat down to the pectoralis major fascia. It is important to excise all the breast glandular tissue leaving intact a thin subcutaneous layer that will ensure a postoperative adequate vascularization of the skin flaps and the NAC. The pectoralis major fascia should be preserved, if not invaded by tumor, because it helps with the reconstruction.

The excision of the retroareolar tissue is the key element in the conservative mastectomy. A balance should be achieved between complete excision of the ductal system, to guarantee oncological safety, and minimization of the risk of ischemia, that may result in NAC excision. Routinely, core excision of the nipple is performed using the scissors or the scalpel, in order to remove the duct bundle, and the specimen is analyzed with frozen section. Positive results are a contraindication for NAC preservation.

Following the glandular excision, we advocate implementation of intraoperative radiotherapy on the NAC, as a risk reducing procedure for local recurrence. In case of ischemic changes intraoperatively, the radiotherapy is delayed until the next day. A linear accelerator is used and a fractionated dose of 16 Gy is administered on the NAC. The subsequent reconstruction is performed by a reconstructive surgeon. In the majority of cases we use heterologous implants, like expanders or fixed volume silicone implants. A full pocket is created using the pectoralis major and the serratus muscle. The implant is placed inside this pocket that should offer the maximum coverage. If NAC or flap ischemia are suspected, an expander implant is preferred, in order to minimize the tension. Autologous flaps are preserved for special cases, like large breasted women with large skin envelope.

Results after 20 months of follow-up

In 2009 we published our results with 1,001 conservative mastectomies[9]. Eight hundred and nineteen patients (82%) had invasive tumors and 182 (18%) had intraductal neoplasia. Seven hundred and ninety nine patients (799) had fixed volume implant reconstruction, 195 had expander implant and only 7 had a TRAM flap. NAC radiotherapy was implemented on all patients; eight hundred patients (80%) had intraoperative radiotherapy and 201 (20%) had delayed radiotherapy. After a median follow-up of 20 months (range 1–69 months), 14 (1.4%) locoregional recurrences, 36 (3.6%) distant metastases and 4 (0.4%) deaths were observed. Out of the 14 locoregional recurrences, 10 presented close to the tumor site and 4 were situated close to the mastectomy scar. There was no recurrence on the NAC. Interestingly, 86 (8.6%) cases were found to have false negative frozen section of the retroareolar tissue. Permanent histology revealed 61 intraductal and 25 invasive lesions. In 79 (91.8%) patients the NAC was preserved, despite the positive permanent histology and after 20 months of follow up no NAC recurrence was reported. Another 81 patients, who were found to have close areolar margins on permanent histology, remained free of local recurrence.

The most common complication in our series was capsular contracture, which needed re-operation in 155 patients (15.5%). No difference was noted between fixed volume implant and expander. Total and partial NAC necrosis was observed in 3.5 and 5.5% respectively and in 5.0% of patients the NAC had to be removed. Skin necrosis was more common in large breasted patients with implant reconstruction. Aesthetic evaluation was available for 414 patients (41.3%) and it was made according to a 1 to 10 scale (1-worst, 10-best results). Both patients and surgeons evaluation was 8/10. The lowest score (2/10) was for NAC sensitivity, as only 15% of patients recovered some kind of sensitivity after one year. No difference in cosmesis was observed between fixed implant and expander. Similarly, there was no difference in recurrence rate, complications and cosmesis between patients who received intraoperative and delayed radiotherapy.

Results after 50 months of follow-up

The indications for conservative mastectomy remain equivocal. From the oncological point of view tumor size and NAC-tumor distance are the main issues of controversy. In an effort to better define the indications for conservative mastectomy, we studied the risk factors for local in breast recurrence in a series of 934 conservative mastectomies performed between 2002 and 2007 (unpublished data). After 50 months of follow-up, 5-year overall survival was 96.4% (Figure 2). Eleven patients (1.17%) presented with a NAC recurrence. Seven of them developed Paget disease associated with DCIS of the underlying ducts and four patients presented with invasive carcinoma. In all patients NAC was surgically removed and after a median follow-up of 33 months there is no evidence of recurrence. Of 70 patients with false negative retroareolar frozen section and NAC preservation, none presented with a recurrence on NAC. Local in breast recurrence was observed in 37 patients (3.9%).

Risk factors for either NAC or in-breast recurrence are mainly related with the biological characteristics of the tumor. For patients treated for invasive cancer, the tumor size was a risk factor for NAC recurrence ad the number of positive lymph nodes for in-breast recurrence. For patients treated for tumors with an intraductal component, age and resection margins were additional risk factors. This study made evident that the presence of ductal carcinioma *in situ* (DCIS) or of invasive cancer with extensive DCIS is a risk factor for NAC recurrence, as out of 11 patients with NAC recurrence 10 had either pure DCIS or extensive intraductal neoplasia with invasive cancer.

Psychological impact of conservative mastectomy

The effect of nipple preservation offered by conservative mastectomy on the patients' emotional status and sexual life was studied in our Institute using a newly developed questionnaire[10]. Between 2004 and 2006, 310 breast cancer patients participated in the study by completing the questionnaire mailed to them one year after the definite reconstructive operation. Fifty one percent (51%) had conservative mastectomy with immediate reconstruction and 68% had simple mastectomy with immediate breast reconstruction and delayed

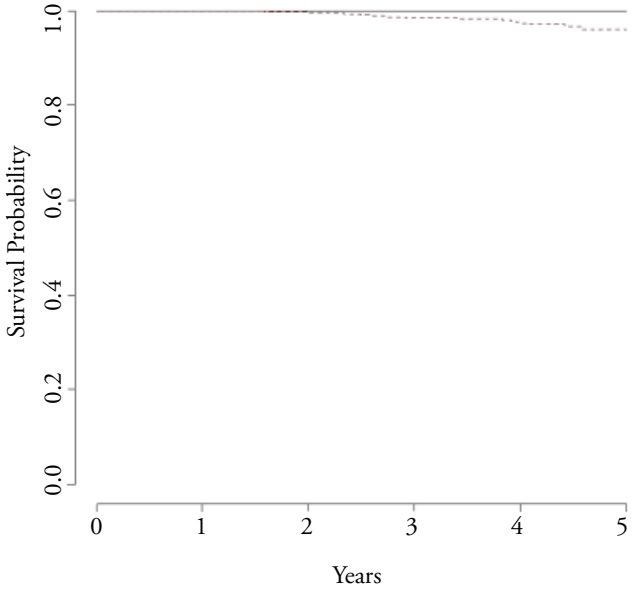

Figure 2. 5-year overall survival after conservative mastectomy

nipple reconstruction. The aim of the study was to evaluate the impact of NAC preservation on body image perception, sexuality and the psychological status of the survivors. The mean age of participants was 46 years for both groups and patients who underwent conservative mastectomy had a statistically significant educational status. For women with NAC reconstruction, it was more difficult to look at their naked body or to be looked at by their partners, compared to women with conservative mastectomy. The feeling of mutilation was higher when NAC was not preserved and the satisfaction with cosmetic results was lower. Nevertheless, sexuality was not affected by the type of intervention. The vast majority of conservative mastectomy patients (142/154) stated that NAC preservation helped them cope with cancer and have a more normal perception of their body image, without increasing the anxiety levels for a possible future recurrence. Almost 90% of women with NAC reconstruction reported that they would have preferred to undergo NAC preservation. This study demonstrates the psychological benefits obtained by conservative mastectomy and proves that it significantly improves the quality of life of the breast cancer survivors (Figure 3).

In a recently published study, we further focused on psychological issues in patients with conservative mastectomy and we investigated the reasons why women choose to preserve their NAC[11]. One hundred and ninety patients, who responded in our questionnaire, reported that they were strongly influenced by the surgeon's opinion and by the fact that NAC preservation would help them reduce psychological distress, maintain their body image and improve their satisfaction. Very few women reported on the maintenance of sexuality, probably because it is still considered a taboo or because normal sexual life is not only affected by the body image of the patient, but also by the general psychological distress due to the illness.

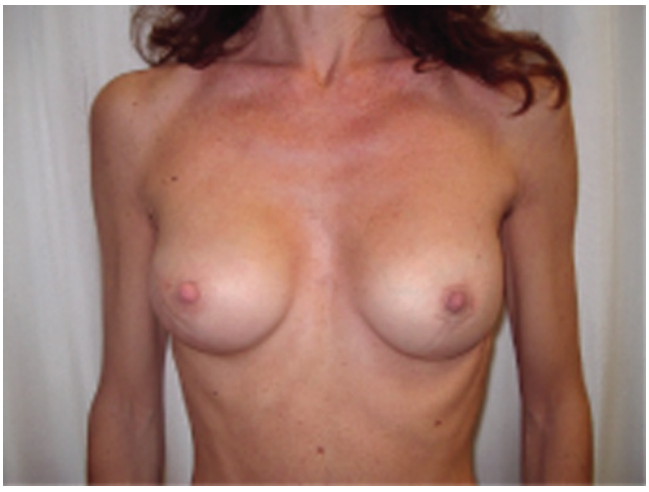

Figure 3. Aesthetic result after right conservative mastectomy and left mammoplasty with implant

Conclusions

In the post breast conservation-era, the conservative mastectomy is an emerging technique that seems to combine oncological safety with high quality cosmetic outcomes. In spite of the limited international experience, which comes from small series of patients, the first results of a relatively short follow up are more than encouraging. The oncological and reconstructive indications vary between the centers that perform the technique, and have still to be better defined. The IEO has presented the largest series of conservative mastectomy in several publications with very good oncological and aesthetic results. The close cooperation between the breast and the reconstructive surgeon is necessary, so that conservative mastectomy offers an important psychological benefit to breast cancer survivors.

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