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ORIGINAL ARTICLE

# Oncoplastic reduction mammoplasty for breast cancer in women with macromastia: Oncological long-term outcomes

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breast cancer;
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**Summary** *Objective:* To evaluate the long-term results of tumorectomy and concomitant bilateral oncoplastic reduction mammoplasty (ORM) for early stage breast cancer patients with macromastia in terms of local disease control and long-term oncological results.
*Patients and method:* Data of 82 patients with macromastia undergoing ORM for breast cancer between 1996 and 2011 were retrospectively examined and evaluated with regard to oncological results.
*Results:* The median age was 50 years. The median follow-up was 121 months (range 28–212 months). The median breast volume was 1402 $cm^3$ and the median weight of excised breast material was 679 g. The median surgical margin was 16 mm. Ten-year local recurrence rate was 8.7%. The 10-year overall survival rate was 82.2% and the disease-free survival rate was 73.2%. Early and late complication rates were 12.2% and 14.6%, respectively.
*Conclusions:* From the standpoint of local disease control and long-term observation, ORM can be considered a very safe and acceptable treatment for early stage breast cancer in women with macromastia.


Conflicts of interest: All contributing authors declare no conflicts of interest.

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## 1. Introduction

Breast-conserving surgery (BCS) is the standard treatment for early stage breast cancer, but this procedure is associated with certain oncological and cosmetic problems, such as large breast size, positive margins, tumor/breast volume ratio, problems associated with radiotherapy (RT), and patient dissatisfaction. The frequency of macromastia in breast cancer patients undergoing BCS is 40%.[1] In Losken et al's meta-analysis,[2] the rate of positive margins after BCS was 20.6%. Some problems have been reported with RT dose homogeneity in post-BCS patients with large breasts,[3] and aesthetic concerns in post-BCS patients have reached 30%.[4] Indeed, postoperative RT problems, aesthetic concerns, and overall patient satisfaction rate are considered relative contraindications for choosing BCS in breast cancer cases with macromastia.

Bilateral oncoplastic reduction mammoplasty (ORM) combines the techniques of tumorectomy and bilateral breast reduction. Thus, a tumor can be excised with wider margins, and the effectiveness of RT on a reduced breast increases.[5] Because screening programs and adjuvant therapies indicate that patients with breast cancer have a longer life expectancy, breast aesthetics and quality of life have become more critical. Bilateral reduction mammoplasty improves quality of life.[6]

Despite the increase in the number of ORM studies, there are no data showing long-term oncological results for ORM in patients with macromastia, although this is by far the more common procedure. Therefore, we examined the 10-year results of women with macromastia undergoing ORM for early stage breast cancer in terms of oncological results. The principal aim of this study was to evaluate the efficacy of long-term oncological local control in ORM. This was gauged by positive margins, close margins, and ipsilateral recurrence. Regional recurrence was not considered. The secondary aim was to determine the impact of ORM on 10-year overall survival (OS) and disease-free survival (DFS) rates.

## 2. Patients and methods

A retrospective review of the medical records of consecutive 82 patients with macromastia undergoing concomitant ORM between January 1996 and May 2011 was carried out. According to the 2010 American Joint Committee on Cancer/Union for International Cancer Control breast cancer staging system, patients with Stages 1 and 2 were included in this study. Patients with *in situ* Stage 3 breast cancer, or breast volume less than 1000 $cm^3$ were excluded. Eight patients who underwent ORM withdrew from observations and were excluded from the study. Macromastia was defined as breast volume more than 1000 $cm^3$. The cases were examined for demographics, macromastia, operative and oncologic outcomes, complications, and adjuvant therapy. All cases were discussed and treatment options were initially planned in multidisciplinary weekly meetings. Written informed consent was obtained for the surgical procedure. This study was approved by the local ethics committee.

### 2.1. Patient evaluation and operative techniques

Routine preoperative oncological screening was carried out in all patients diagnosed with breast cancer. Wire localization was used on nonpalpable breast lesions during ultrasound and/or mammography. Preoperative magnetic resonance imaging (MRI) was performed in nine cases. Breast volume of all patients was measured using a Grossman–Roudner device.[7] Breast asymmetry was accepted as a disparity if breast volume was over 10%.

During the preoperative evaluation, we determined the tumor quadrants to be excised, the choice of nipple areola complex (NAC) flap, access to the axilla, choice of skin incision, and the estimated volume of breast tissue to be removed. Similar decisions were made for the contralateral breast. Tumors were excised with a minimum margin of 1.5 cm. In the final pathological evaluation, any margin less than 2 mm was accepted as a positive margin. Intraoperative margin control was achieved using frozen sections with specimen mammography for multifocal tumors, and all re-excisions were performed immediately. The only skin removed included biopsy-incision scars and skin-covering tumors closer than 1 cm to the surface. Nipple resection was performed in tumors closer than 2 mm to the nipple. Metal clips were placed in the tumor bed as a guide for RT, and the orientation of the excised specimen was marked. Similar procedures were carried out simultaneously on the contralateral breast to achieve symmetry. The ipsilateral breast was left 10% larger to allow for shrinkage during RT. At least two members of the strong five-member surgical team were present at each operation.

The Wise pattern incision was chosen for its ease of axillary access, flap alternatives, and ease of breast reconstruction. We preferred the vertical incision in cases of macromastia less than 1300 $cm^3$ to minimize the incision. Our choice of NAC carrying the pedicle was based on forming a pedicle in the breast section furthest from the tumor. A free nipple graft was used in cases where the NAC distance was more than 35 cm. In cases of nipple involvement, we performed a central resection, followed by a Grisotti flap reconstruction. Sentinel lymph node biopsy (SLNB) or four to eight lymph node sampling was implemented in clinically node-negative patients, and axillary dissection (AD; Levels 1 and 2) was performed in node-positive cases. Complications were recorded as early ($<$2 months) and late ($>$2 months).

Standard RT was applied 3 weeks postoperatively with 50 Gy to the whole breast and a 10-Gy boost to the tumor bed. Of the total patients in this study, 24 were administered chemotherapy (CT), 25 were administered both CT and hormone therapy (HT), and 33 received only HT. The CT regimen was fluorouracil, epirubicin, and cyclophosphamide (FEC) in 21 patients; cyclophosphamide, methotrexate, and fluorouracil in nine; adriamycin (doxorubicin) and cyclophosphamide (AC) in seven; FEC + taxane in seven; and AC + taxane in five patients. Tamoxifen was used for HT in 47 cases, and aromatase inhibitors were used in 16 cases. In addition, 16 Cerb-B2-positive cases were treated with trastuzumab. Patients were followed by surgeons and medical oncologists every 4 months for the first 2 years, every 6 months for the following 3 years, and then on an annual basis.