Oncoplasty for Breast Carcinoma

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Abstract

Objective: To assess the oncologic and cosmetic outcomes in women with breast carcinoma who were treated with breast-conserving surgery using oncoplastic techniques with concomitant symmetrization of the contra lateral breast.

Introduction: Although breast-conserving surgery is the standard form of treatment for invasive breast tumors up to 4 cm, cosmetic results may be poor and clear resection margins difficult to obtain in patients with large, ill-defined, or poorly situated tumors. The integration of oncoplastic techniques with or without a concomitant contralateral symmetrization procedure is a novel surgical approach that combines both oncologic and plastic surgical procedures and allows wide excisions and prevents breast deformities.

Patients and Methods: This is a prospective study of 32 patients who were operated on for breast carcinoma between August 2004 and Mars 2006 by the author. The procedure was proposed for patients in whom conservative treatment was possible on oncologic grounds but where a standard lumpectomy would have led to poor cosmetic outcomes. Standard treatment protocols were followed. All patients received postoperative radiotherapy except 2. Mean follow-up was 1.5 years. They were compared to a control group including 43 patients with the same inclusion criteria.

Results: Mean weight of excised material on the tumor side was 393 g. The actuarial 2-year local recurrence rate was about 6%, contra lateral procedure was needed in 10%. Cosmoses was favorable in 88% of cases.

Conclusion: The use of oncoplastic techniques with or without concomitant symmetrization of the contra lateral breast allows extensive resections for the treatment of breast carcinoma and results in favorable both oncologic and esthetic outcomes. This approach might be useful in extending the indications for conservative breast therapy.

Key Words: Breast carcinoma – Conservative breast surgery – Oncoplasty.

Introduction

BREAST-CONSERVING therapy is considered the standard form of treatment for invasive breast tumors up to 4 cm. This was proved by the long-term results of randomized trials that have shown that breast-conserving therapy (BCT) provides same oncologic results as the mastectomy in early breast cancer [1].

Sometimes a poor cosmetic outcome after tumor resection may occur specially in the lower quadrants. Cosmetic outcome of breast surgery is a major concern in younger patients. Oncoplastic techniques, which usually use optimal one-stage glandular reconstruction and plastic reshaping of the healthy breast, are well accepted by younger women [2].

Oncoplastic surgery can be defined as the combination of reconstructive techniques with oncologic breast conserving surgery [3].

Oncoplastic techniques may be either volume replacement or volume displacement. In volume replacement autologous tissue is harvested and transferred from a remote site into the resection defect, replacing the volume of excised breast tissue. This commonly involves the use of latissimus dorsi (LD) flaps. As the volume is restored, contralateral surgery is rarely required to achieve symmetry. Complications include donor site morbidity, shoulder dysfunction and flap loss. Should a mastectomy be required at a later date, LD reconstruction cannot be used.

While in volume displacement local glandular or dermoglandular flaps are mobilized and transposed into the resection defect. This leads to a net loss in breast volume and the potential need for a simultaneous contralateral reduction to achieve symmetry. The resection of the tumour can be
combined with a range of mammoplasty techniques according to the location of the pedicle for nipple areola blood supply trying to achieve the best possible cosmetic outcome [4].

Volume displacement is associated with the recognized complications of conventional reduction mammoplasty including parenchymal flap necrosis, nipple/areola necrosis, wound breakdown and potential cosmetic failure [5].

Technique starts with full-thickness fibroglandular excision of the mass and surrounding breast tissue allows resection with wide surgical margins. Subsequent breast-flap advancement (mastopexy) results in closure of the resulting surgical defect with good or excellent cosmetic closure. These approaches can improve both the aesthetic outcome of breast cancer resections and the likelihood of surgeons obtaining wide surgical margins. Advanced volume-displacement techniques similar to those used in breast reductive surgery, can greatly increase the options for breast conservation in complex cancer cases [4].

The oncoplastic approach can result in significantly greater glandular resection and wider free histological margins compared to standard lumpectomy. The need for re-excisional surgery is significantly reduced with the use of oncoplastic surgery. Furthermore, a trend towards fewer secondary mastectomies was seen for the oncoplastic approach versus standard lumpectomy [6].

Objective: To assess the oncologic and cosmetic outcomes in women with breast carcinoma who were treated with breast-conserving therapy using oncoplastic techniques with or without concomitant symmetrization of the contralateral breast.

Patients and Methods

This is a prospective study of 32 patients during the period between May 2006 to January 2009 patients with histologically verified stage I or II breast cancer were eligible for the study.

The procedure was proposed for patients in whom conservative surgery for breast carcinoma was possible on oncologic grounds but where a standard lumpectomy would have led to poor cosmetic outcomes.

Preoperative evaluation included physical examination of the breast, mammography, and breast ultrasonography and in some cases contrast-enhanced MRI. A needle core biopsy was always performed to confirm the cancer diagnosis. Metastatic work up was done as well.

Informed consent was obtained from all patients after explaining the procedure.

Oncologic exclusion criteria for this modified BCT were the same as for all BCT: failure to achieve microscopic resection free margin (R0 resection) after reasonable attempts, multicentric carcinoma, inflammatory breast cancer, contraindication for radiotherapy and the patient’s own preference. A Non-oncologic exclusion criterion was small breast size. Smoking, diabetes or BMI above 30 were not exclusion criteria. If necessary, immediate or late contra-lateral breast reduction was done according to the patient’s preference.

Intraoperative frozen sectioning was used to ensure cancer free resection margins. Patients with positive margins at definitive histology were treated by mastectomy. One suction drain was placed at the end of the operation to ensure drainage of wound seroma or haematomas.

Standard treatment protocols were followed. All patients received postoperative radiotherapy except two (due to unexpected postoperative medical conditions). Adjuvant systemic treatment was given to all patients according to the final histopathological staging according to current treatment protocols and patients general condition. Mean follow-up was 1.5 years. They were compared to a control group of 43 patients with the same inclusion criteria who underwent conservative breast surgery by the standard lumpectomy techniques during the same period.

Patient and tumour characteristics, details of adjuvant therapy, surgical intervention, and complications of surgery were all recorded. Patients were examined for operative outcome and postoperative complications.

Operative technique:

Preoperative marking (Fig. 1) was done in the standing position, with marking of the midline, inframammary sulcus, site of the tumor and excision margins, areolar margins and possible circumareolar incision (Fig. 2), markings were done bilaterally especially if contralateral symmetrization was planned. The site and size of the lesion determined the incision used.

The technique used depended on the site of the lesion, in lower quadrants lesions the inverted T shape incision with a reduction mammoplasty technique with a superiorly based flap for NAC (nipple areola complex) in lateral lesion, a radial and circumareolar de-epitheliazation with elevation.
of NAC or a batwing or hemi batwing incision and in lesions close to the nipple areola complex a circumareolar incision with a doughnut mammoplasty technique to be closed either as circumareolar incision or with a lower central scar with elevation of nipple areola complex (NAC). Finally if NAC was infiltrated or in lesions close to the NAC nipple areola resection was done.

After extensive dissection of skin flaps over not only over the tumor but a large area in the breast is dissected from overlying skin and underlying pectoral fascia. A wide quadrantectomy is generally performed, without considering the residual breast shape since it was to be remodeled by immediate mammoplasty. A full thickness resection of the tumour and surrounding glandular tissue was undertaken down to the pectoral fascia. By widely undermining the fibro glandular tissue at the pectoralis fascia and the subcutaneous layer, the glandular defect was eliminated by approximation sutures of the mammary tissue to recreate a harmonious shape to have a smaller breast but without a defect in the glandular disc or having a cavity left behind after large resection, the nipple areola complex is elevated to compensate for the defect which helps to have a better cosmetic outcome. The breast tissue specimen was weighted and oriented in three dimensions by the surgeon, sent to the pathologists in a fresh state for assessing tumor margins by frozen section examination. The specimens were inked with multiple colors (Fig. 3) to assist in identifying margins. Following adequate formalin fixation, the tumour histopathologic type was categorized according to the WHO classification. Details regarding tumour staging were recorded according to the International Union against Cancer TNM staging system. Tumour size as determined by the maximal histological size and margin widths was measured by the pathologist. Positive margins were defined as the presence of invasive carcinoma or DCIS at an inked margin. Negative pathologic margins were defined as no invasive carcinoma or DCIS present at the inked margins. All tumours were assessed for an extensive intraductal component (EIC).

Axillary lymph node dissection was performed through an axillary incision except in cases upper outer quadrant lesions where axillary dissection were performed through the same incision.

Follow-up:

During the first year, patients had a close follow-up every 3 months with clinical examination, laboratory test including tumor marker and a plain x ray of the chest and the abdominal sonography every 6 months as well as mammography plus ultrasound per year. Clinical evaluation consisted of palpation and quality of life questions such as arm mobility, and breast sensation (normal or not normal, no scale). Furthermore, patients were asked to judge their cosmetic result.
Table (1): Type of skin incision used in our study group.

<table>
<thead>
<tr>
<th>Type of incision</th>
<th>No of cases</th>
</tr>
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<tbody>
<tr>
<td>Inverted T shape</td>
<td>9</td>
</tr>
<tr>
<td>Radial and circumareolar</td>
<td>7</td>
</tr>
<tr>
<td>Batwing or hemi batwing</td>
<td>11</td>
</tr>
<tr>
<td>Elliptical with nipple and areola resection</td>
<td>3</td>
</tr>
<tr>
<td>Circumareolar only</td>
<td>2</td>
</tr>
</tbody>
</table>

**Results**

Average weight of the excised specimen on the oncoplasty side was 393 gm compared to 216 in the BCT group and the $p$ value was significant, tumor size was significantly larger. Mean age was younger, local recurrence rate was about 6%, operative time was longer and wound complications were slightly more.

Cosmetic evaluation was done by the surgeon and the patient after finishing the postoperative radiation therapy and as shown in the following Table (4) (Figs. 4,5).

Overall cosmetic outcome was superior according to both the patients and the surgeons in the oncoplasty group compared to the lumpectomy group the accumulation of seroma was less and the need for repeated aspirations was minimal, however longer operative time and hospital stay in the oncoplasty group.

Out of 15 patients for whom symmetrization was proposed Only 3 patients underwent symmetrization surgery on the healthy side, other patients were satisfied of the final outcome and did not desire to undergo other surgery that they considered not necessary.
Table (2): Comparison of different variables between oncoplasty and standard breast conservative surgery groups.

<table>
<thead>
<tr>
<th></th>
<th>Oncoplasty</th>
<th>BCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>52</td>
<td>56</td>
</tr>
<tr>
<td>Number</td>
<td>32</td>
<td>43</td>
</tr>
<tr>
<td>Median tumor size</td>
<td>29mm</td>
<td>21mm*</td>
</tr>
<tr>
<td>Positive LN status</td>
<td>21/32 (65%)</td>
<td>25/43 (58%)</td>
</tr>
<tr>
<td>Site UOQ</td>
<td>16</td>
<td>27</td>
</tr>
<tr>
<td>Site UIQ</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Site LOQ</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Site LIQ</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Site retroareolar</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

*p value was less than 0.005.

Table (3): Outcomes of surgery in both study groups.

<table>
<thead>
<tr>
<th></th>
<th>Oncoplasty</th>
<th>BCT</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average weight</td>
<td>393gm</td>
<td>216gm</td>
<td>Less than 0.005</td>
</tr>
<tr>
<td>Local recurrence</td>
<td>2/32 (6%)</td>
<td>4/43 (9%)</td>
<td>0.06</td>
</tr>
<tr>
<td>Positive margins</td>
<td>4</td>
<td>5</td>
<td>0.03</td>
</tr>
<tr>
<td>Mastectomy rate</td>
<td>3/32 (9%)</td>
<td>5/43 (12%)</td>
<td></td>
</tr>
<tr>
<td>Contralateral procedure</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Wound comp rate</td>
<td>5/32 (15%)</td>
<td>2/43 (4%)</td>
<td></td>
</tr>
<tr>
<td>Traumatic fat necrosis</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Operative time</td>
<td>2.13 min</td>
<td>1.11 min</td>
<td></td>
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</table>

Table (4): Cosmetic evaluation in both groups.

<table>
<thead>
<tr>
<th>Results</th>
<th>Oncoplasty</th>
<th>Conser breast surg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>15/32</td>
<td>14/43</td>
</tr>
<tr>
<td>Very good</td>
<td>9/32</td>
<td>8/43</td>
</tr>
<tr>
<td>Good</td>
<td>4/32</td>
<td>7/43</td>
</tr>
<tr>
<td>Accepted</td>
<td>3/32</td>
<td>8/43</td>
</tr>
<tr>
<td>Poor</td>
<td>1/32</td>
<td>6/43</td>
</tr>
</tbody>
</table>

Discussion

The debate about the oncologic safety of breast conserving therapy (BCT) in patients with stage I and II breast cancer is over after Veronesi and Fisher published the results of their prospective randomized trials [1,7]. However, cosmetic problems arise in some patients after BCT especially in small breasts or tumor located in the inferior quadrants usually give unfavorable aesthetic results after wide tumourectomy [8].

The importance of wide excision of breast cancers in BCT are demonstrated in many studies as the prevalence on associated in situ component can reach up to 72% of patients however extensive in situ components can be found in about 18% [9].

In our series, there were two patients presented with local recurrence, one of them had metaplastic carcinoma (carcinosarcoma) who had early recurrence only after 8 months, the tumour was 2.5 cm in diameter, the other case had a 4 cm tumour with large breast, we did not have any recurrence in an average 24 months follow-up of tumours less than 2 cm and overall recurrence rate is acceptable and comparable and even better when compared to our control group and to standard BCT.

Rietgens reported that Long term follow-up after oncoplasty oncoplastic techniques can be as safe as mastectomy for tumors that are less than 2 cm on a follow-up period of average 74 months, and over all long term oncologic results of BCT with oncoplastic surgery are comparable with the results of BCT randomized trials [8].

We believe that the lower local recurrence rate is attributed to firstly good exposure of the tumor due to extensive dissection of skin flaps which helps good identification of resection margins and secondly due to wider resection margins which in our study was at least 2 cm and reached up to 5 cm in some patients with huge breasts, patients were satisfied with the cosmetic outcome, radiotherapy was facilitated and was made possible only after reduction as better dose homogeneity is obtained [10].

Many authors agree that larger margins can be obtained by using oncoplastic techniques together with even better cosmetic outcome [11,12,13].

Follow-up for the series is short and the authors recognize that more meaningful information about oncological outcome will emerge over time.

Not all patients with breast cancer may need oncoplastic surgery [13]. Eligible patients usually have an unfavorable relation in size between breast and tumor, medium or large breasts as well as tumor locations leading to large visible scars and deep breast defects if BCT is performed [2]. We also think that very small peripheral lesions that can be resected safely with good safety margins are also not candidates for oncoplastic resections.

Though pathological reporting of negative margins is the golden role, however this does not
ensure that there is no residual tumors [14], this is the basic stimulus for us in implementing the oncoplastic approaches in stead of classic techniques of breast conserving surgery as the specimen is larger wider resection margins can be obtained and local recurrence rate is lowered \((p=0.03)\) together with even better cosmetic results in selected patients.

Though all patients had the same inclusion criteria the patients in this series had on average more advanced tumours than patients in the control group as shown with larger average tumor diameter \(2.9\) cm versus \(2.1\) cm \((p=0.000)\) and more incidence of node positive cases \(65\%\) versus \(58\%\) \((p\ value\ not\ significant)\) indicating that oncoplastic techniques may help to avoid mastectomy in selected patients otherwise are not candidates for conservative surgery due to bad cosmetic outcome. For many women in this series the alternative surgical option was mastectomy with or without reconstruction. We believe this procedure to have many benefits for the correctly chosen patient. The benefits, improvements in planning and disadvantages will be further apparent with time and study [18].

The complication rates are low in this series and only slightly higher in oncoplasty compared to standard conservative breast surgery group which is mostly due to the longer operative time together with larger incisions needed to perform the remodeling of the remaining breast tissue. No patient in this series had a delay in adjuvant treatment possibly as a result of this technique. Wound gaping, seroma or fat necrosis in this series was all minimal and did not affect the final result either cosmetically or oncologically. Skin flap necrosis was more common with oncoplasty. Its incidence correlated with the size of the tumor; as the larger the size of the lesion the more the need to dissect more. However all cases were managed either conservatively or in 2 cases with secondary sutures with good cosmetic outcome. This complication is also reported by F. Fitzal et al. [2] where 2 out of 11 patients had flap necrosis, they were managed conservatively, we prefer early secondary sutures in order not to delay adjuvant therapy.

In our study though symmetrization was offered to about 15 patients, only 3 patients accepted performing surgery on the normal breast for symmetrization, 2 of them had just mastopexy and a third one reduction mammoplasty. The same observation of low rate of patient acceptance to perform symmetrization surgery was reported by Naguib who stated that no patient agreed to undergo contra-lateral mammoplasty for symmetrization. When this option was offered synchronously with tumor ablation, patients feared bilateral scarring and disfigurement. When it was offered as a delayed procedure, patients tired from previous surgery and long exhausting radiotherapy and chemotherapy were reluctant to go through an additional "unnecessary" surgical intervention [16].

Overall final cosmetic results were better with the oncoplasty group though mean average tumour size was larger. Even some authors use this technique when the size of the tumor is large if the breast size is suitable [17].

Oncoplastic surgery will be the future of conservative breast surgery and may replace it, in many cases as the recurrence rate is lowered and the cosmetic outcome can be greatly improved, long term results are expected to be at least equivalent to tumourectomy if not better.

**Conclusion:**

The use of oncoplastic techniques with or without concomitant symmetrization of the contralateral breast allows extensive resections for the treatment of breast carcinoma and results in favorable both oncologic and esthetic outcomes. This approach might be useful in extending the indications for conservative breast therapy.

**References**


