E21. Oncoplastic surgery: Classification and quadrant per quadrant atlas

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Introduction

Breast conservation surgery (BCS) for breast cancer is based on the tenet of complete removal of the cancer with adequate surgical margins, while preserving the shape and appearance of the breast. Achieving both goals together in the same operation can be challenging, and BCS does not always produce good cosmetic results. An alternative is to downsize the tumour preoperatively with either chemotherapy or hormone therapy. However, not all tumours respond to neoadjuvant treatments.

The failure of classical BCS techniques to offer solutions for challenging scenarios has stimulated the growth and advancement of oncoplastic surgery (OPS) during the past decade. OPS is based upon integration of plastic surgery techniques for immediate breast reshaping after a wide excision for breast cancer.

Having developed various OPS techniques for the past 20 years, our following goal was to develop a classification of oncoplastic techniques and outline a systematic approach that could help all breast surgeons undertaking OPS for BCS.

Oncoplastic principles: selection criteria

We identify three elements in order to select the optimal OPS technique for each patient.

1. Excision volume. Once 20% of the breast volume is excised, there is a clear risk of deformity. OPS allows for significantly greater excision volumes while preserving the natural breast shape. All OPS studies have demonstrated that an average of 200 g up to 1000 g or more can be removed on a medium sized breast with no cosmetic compromise.

2. Tumour location. There are zones, such as the lower pole or upper-inner quadrants of the breast that are at high risk of deformity during BCS when compared to more forgiving locations. For extensive resections, we developed an oncoplastic atlas of surgical techniques that provides a specific mammoplasty technique for each segment of the breast.

3. Glandular density. Glandular density is the final component of a complete OPS evaluation. It is evaluated both clinically and radiographically. In dense glandular breasts (BIRADS 3/4), extensive undermining can easily be performed without risk of necrosis. Fatty breasts (BIRADS 1/2) yield a higher risk of fat necrosis after undermining.

4. Oncoplastic classification system. We published a new classification of OPS techniques. We define two levels, based upon the amount of tissue excised and the type of technique used for breast reshaping. A level I approach is based on dual plane undermining of the gland including the nipple areola complex (NAC), followed by glandular reapproximation. No skin excision is required. Level II techniques allow major volume resection. They encompass more complex procedures derived from breast reduction techniques. These "therapeutic mammoplasties" involve extensive skin excision and breast reshaping.

Table 1: Oncoplastic decision guide

Criteria	Level I	Level II
Maximum excision volume ratio	20%	20–50%
Requirement of skin excision for reshaping	No	Yes
Mammoplasty	No	Yes
Glandular characteristics	Dense	Dense or fatty

Step by step approach for level I OPS

There are six steps for level I OPS. They begin with the skin incision (1) followed by extensive undermining of the skin (2) and NAC (3). A full thickness glandular excision is performed from the subcutaneous fat to the pectoralis fascia. This type of excision allows free anterior and posterior margins (4). The glandular defect is systematically closed by glandular flaps that are sutured together to close the defect (5). If required, an area in the shape of a crescent bordering the areola is deepithelialised. The NAC is then repositioned in the centre of the breast (6).

Level II oncoplastic surgery

Level II techniques are reserved for situations that require major volume excisions between 20 and 50% of the total breast volume. They are based upon mammoplasty techniques. To simplify the selection of the appropriate technique, we devised an atlas based on tumour location. These procedures are listed in a clock-wise direction starting at 6 o'clock and described for the left breast (see Table 2).

1359-6349/$ – see front matter

Table 2: Level II OPS: quadrant per quadrant atlas (left breast)

Clock position	Procedures
5–7 o'clock	Superior pedicle mammoplasty /inverted T or vertical scar
7–8 o'clock	Superior pedicle mammoplasty/ V scar
9–11 o'clock	Batwing
12 o'clock	Inferior pedicle or round block mammoplasty
1–2 o'clock	Racquet mammoplasty
4–5 o'clock	J scar mammoplasty
Central subareolar	Inverted T or vertical scar mammoplasty with NAC resection

Discussion

Until recently, breast surgeons could provide only two options for patients with breast cancer: either a modified radical mastectomy or a segmental excision followed by radiation. Oncoplastic surgery has delivered a third pathway, enabling surgeons to perform major resections, involving more than 20% of breast volume without causing deformity. This "third pathway" allows surgeons to extend the indications for BCS without compromise of oncologic goals or of the aesthetic outcome. With immediate reshaping employed through OPS, major resections can now be achieved.

The main indication for OPS is large lesions for which a standard excision with safe margins would either seem impossible, or lead to a major deformity. Extensive DCIS, lobular carcinoma, multifocal tumours, and patients with partial or poor responses to neoadjuvant treatment are all potential indications for OPS procedures. Standard BCS that results in positive margins constitute an additional category of patients.

Oncoplastic surgery is fully integrated into a multidisciplinary environment. Pre and postoperative treatments are not modified. Our initial prospective analysis of a series of 100 patients undergoing level 2 OPS demonstrated 5-year overall and disease free survival rates of 95.7% and 82.8%, respectively. A more recent retrospective review of an extended series of 298 patients treated with OPS demonstrated 5-year recurrence free and overall survival rates of 93.7% and 94.6%, respectively This series confirms the initial equivalent comparison of OPS and standard BCS. Rietjens [1] has reported in his long-term results from the European Institute of Oncology no local relapse in the pT1 cohort. The pT2 and pT3 combined group had a 5-year local recurrence rate of 8% and a mortality rate of 15%. The overall local recurrence rate was determined to be 3%.

Surgeons embarking in OPS should be aware of the risk of complications and the factors that increase this risk. Glandular necrosis is the most challenging complication. Our prospective evaluation of complications in our initial series demonstrated a high incidence of delayed wound healing (9%). This rate has been considerably reduced since we began incorporating the third key element, breast density, into our decision making process. Our complication rate is now less than 5%: there are no increased treatment delays with the more extensive level II techniques

Oncoplastic surgery level II techniques are numerous. Most authors utilise the inverted T-mammoplasty for all quadrants of the breast. Thus, for upper pole tumours, the excision defect is filled by extensive mobilisation of the lower gland. In our experience, the implementation of the same reduction mammoplasty pattern for all tumour locations has significant limitations. Advancement of distant breast tissue to fill the defect is at high risk of complications due to tissue necrosis. Our atlas is based upon a direct excision of skin over the tumour that allows reshaping and avoids complications due to extensive glandular mobilisation. Because almost all cosmetic mammoplasties rely on inverted T-incisions, we had to develop new mammoplasty patterns specifically for breast cancer treatment. We also adapted old techniques, such as the J-mammoplasty, that had been abandoned by most plastic surgeons. Thus, we developed almost one technique for each quadrant of the breast.

Conclusion

Oncoplastic surgery allows for wide resections with favourable cosmesis and integrates into a standard multidisciplinary approach for BCS. The ultimate goal is to allow large volume resections with free margins and fewer re-excisions and mastectomies than that which is obtainable with standard BCS.

We propose to stratify OPS into two levels. Even though we are aware that there is no clear-cut division between standard BCS and oncoplasty, and that a cross-over between levels I and II exists, we strongly advocate the adoption of a standardised OPS classification system. The OPS classification and atlas is intended to assist surgeons in choosing the optimal approach for each individual patient in order to avoid complications and to obtain the best oncologic and cosmetic results.

Conflict of interest statement

None declared.

References

[1] Rietjens M, Urban CA, Petit JY: long term oncologic results of breast conservation treatment with oncoplastic surgery. Breast 2007; 16(4): 387–385.