Factors influencing decisions on contralateral symmetrisation procedure among patients with breast cancer

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INTRODUCTION Oncoplastic breast-conserving surgery (OBCS) can cause breast asymmetry. Although contralateral breast surgery to achieve symmetry was offered to these patients, the uptake of symmetrisation was variable. We aimed to determine the factors that deter patients with breast cancer undergoing OBCS from opting for symmetrisation.

METHODS All patients with breast cancer who underwent OBCS of displacement type with no symmetrisation were prospectively surveyed to explore the social, economic, psychological and physical reasons against symmetrisation.

RESULTS A total of 28 patients participated in a survey administered at a mean 21.6 (range 2–47) months after OBCS. A combination of factors, such as worry and desire to treat breast cancer first (67.9%), not being overly concerned about breast asymmetry (57.1%) and fear of pain from additional operation (28.6%), deterred patients from immediate symmetrisation. Worry and desire to treat breast cancer first was the most important single factor for 50% of the patients. Reasons for no delayed symmetrisation included not being overly concerned about breast asymmetry (70.4%), fear of breast cancer recurrence (48.1%) and being happy with current breast asymmetry (33.3%), with the former two reasons equally cited as the single most important deterrent by 30% of patients each.

CONCLUSION A combination of factors may deter patients from symmetrisation. The most significant factors deterring OBCS among patients were worry and desire to treat breast cancer first for immediate symmetrisation, and not being overly concerned about breast asymmetry and fear of breast cancer recurrence for delayed symmetrisation. Reassuring these patients may increase their uptake of symmetrisation, thereby improving patient cosmesis and satisfaction.

Keywords: breast cancer, fear of recurrence, oncoplastic surgery, symmetrisation surgery, therapeutic mammoplasty

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Patients with asymmetric breasts and cancer on the larger breast were also offered OBCS. The type of OBCS performed depended on the patient’s breast size, degree of ptosis, and the size and location of the tumour.

All patients were offered concurrent contralateral breast symmetrisation. Patients who had undergone symmetrisation, lumpectomy with partial breast reconstruction and those with cancer on a larger asymmetric breast were excluded. Patients with breast cancer with contralateral breast cancer/lesion requiring surgery were also excluded. All patients received adjuvant treatment, as recommended by a multidisciplinary team.

Patients who met the inclusion criteria were prospectively invited to participate in a survey using a self-administered questionnaire that consisted of ten multiple-choice questions on social, economic, psychological and physical factors that may have influenced their decision-making. The questionnaire was administered during routine outpatient follow-up visits. If there were any problems with survey interpretation, a breast care nurse was available for assistance. Patients rated breast asymmetry as ‘very’, ‘slight’ or ‘no’. ‘Very’ was defined as marked asymmetry, ‘slight’ as noticeable but not marked asymmetry and ‘no’ as no asymmetry.

RESULTS A total of 55 patients underwent OBCS during the study period. Of these, 27 (49.1%) patients were excluded, as two patients...
were lost to follow-up, two patients underwent completion
mastectomy, one patient underwent symmetrisation, six patients
underwent bilateral breast surgeries, 13 patients underwent
lumpectomy with partial breast reconstruction using local chest
wall flap reconstruction, and three patients had asymmetrical
breasts and cancer on the larger breast. While one patient had
immediate symmetrisation, 28 (50.9%) patients did not, resulting
in an immediate symmetrisation rate of 3.4%. These 28 patients
were prospectively enrolled, and the survey participation
rate was 100.0%. The survey was administered at a mean of
21.6 (range 2–47) months after the OBCS procedure.

The median and mean patient age were 53.0 years and 54.0
(range 36–74) years, respectively. Various OBCS techniques were
used, namely round block mammoplasty (n = 18), wise pattern
mammoplasty (n = 7), vertical mammoplasty (n = 2) and batwing
mammoplasty (n = 1) (Table I). Except for two patients for whom
the specimen weight was not recorded, the mean weight of the
resected breast specimen was 102.3 (range 10–361) g.

Three patients received neoadjuvant chemotherapy and
all except one patient underwent adjuvant radiotherapy. No
locoregional recurrence was reported. 85.8% of patients rated
their postoperative breast cosmetic appearance as excellent
or good. Of the remaining four patients who rated their breast
cosmetic appearance as fair, one patient required repeated re-
excisions to obtain clear margins.

89.3% of patients reported asymmetry of their breasts, with
5 (17.9%) patients and 20 (71.4%) patients reporting great and
slight asymmetry, respectively (Fig. 1). Of the five patients who
reported great asymmetry, 4 (80.0%) patients had wise pattern
mammoplasty and 1 (20.0%) patient underwent round block
mammoplasty.

23 (82.1%) patients did not consider undergoing surgery on
the normal breast at the time of OBCS to achieve symmetry of both
breasts. 5 (17.9%) patients considered immediate symmetrisation
but did not proceed with it. In these 28 patients, a combination
of factors was the reason for deferring symmetrisation at the
time of OBCS, such as worry and desire to treat breast cancer
first (67.9%), not being overly concerned about the cosmetic
appearance of their breasts (57.1%) and fear of pain from
additional operation (28.6%) (Fig. 2). Only 2 (7.1%) patients did
not expect great asymmetry after operation, and only 1 (3.6%) of
these two patients considered this factor as the most important
factor deterring her from immediate symmetrisation. After surgery,
this patient also reported slight asymmetry.

Among the various reasons for not considering immediate
symmetrisation, worry and desire to treat breast cancer first was
cited as the single-most important contributing factor by 50% of
the patients.

With regard to delayed symmetrisation of the normal breast
to achieve symmetrical breast appearance, 25 (89.3%) patients
indicated that they would not consider undergoing the procedure.
While 3 (10.7%) patients considered delayed symmetrisation,
only one patient actually underwent delayed symmetrisation,
resulting in a delayed symmetrisation rate of 3.6%. The most
commonly cited reasons for not opting for delayed symmetrisation

| Variable          | No. (%) |
|-------------------|---------|
| Age (yr)          |         |
| ≤ 50              | 11 (39.3) |
| > 50              | 17 (60.7) |
| T staging         |         |
| Tis               | 4 (14.3) |
| T1                | 6 (21.4) |
| T2                | 15 (53.6) |
| ypT1              | 1 (3.6) |
| ypT2              | 2 (7.1) |
| N staging         |         |
| N0                | 19 (67.9) |
| N1                | 3 (10.7) |
| N2                | 3 (10.7) |
| ypN0              | 2 (7.1) |
| ypN1              | 1 (3.6) |
| Hormonal status   |         |
| ER positive       | 20 (71.4) |
| ER negative       | 8 (28.6) |
| PR positive       | 16 (57.1) |
| PR negative       | 11 (39.3) |
| PR not reported*  | 1 (3.6) |
| HER2 status       |         |
| HER2 positive     | 6 (21.4) |
| HER2 negative     | 19 (67.9) |
| HER2 not reported*| 3 (10.7) |
| OBCS technique    |         |
| Round             | 18 (64.3) |
| Wise pattern      | 7 (25.0) |
| Vertical          | 2 (7.1) |
| Batwing           | 1 (3.6) |
| Cosmetic outcome  |         |
| Excellent         | 12 (42.9) |
| Good              | 12 (42.9) |
| Fair              | 4 (14.2) |
| Poor              | 0 (0) |
| Asymmetry of breasts |     |
| Very              | 5 (17.9) |
| Slight            | 20 (71.4) |
| No                | 3 (10.7) |

*Patients with ductal carcinoma in situ. ER: oestrogen receptor; HER2: human
epidermal growth factor receptor 2; OBCS: oncoplastic breast-conserving surgery;
PR: progesterone receptor; yp: subsequent neoadjuvant chemotherapy

in these 27 patients were: not being overly concerned about the
cosmetic appearance of breasts (70.4%), fear of breast cancer
recurrence and thus not giving much thought to symmetrisation
(48.1%), and being happy with their current breast cosmetic
appearance (33.3%) (Fig. 3).

Subsequent to OBCS, although 23 (82.1%) patients reported
slight or no asymmetry of breasts, only 3 (13.0%) of these patients
cited satisfaction with current breast cosmetic appearance as the
major factor deterring them from pursuing delayed contralateral symmetrisation. Among all the reasons for patients not opting for delayed symmetrisation, the most important contributing factors were not being overly concerned about the cosmetic appearance of their breasts (30.0%) and fear of breast cancer recurrence (30.0%). The subgroup of patients who cited the reason of not being overly concerned about the cosmetic appearance of their breasts was older than the overall cohort, with a mean age of 60 (range 41–74) years.

**DISCUSSION**

We found that in our cohort of patients undergoing OBCS without contralateral symmetrisation, only 17.9% of patients initially considered immediate symmetrisation. Worry over breast cancer was the single most important deterring factor for...
immediate symmetrisation. Following OBCS, although 89.3% of
patients reported asymmetry of breasts, only 10.7% considered
delayed symmetrisation. Not being overly concerned about breast
cosmesis and fear of breast cancer recurrence were cited as the
top reasons for not opting for delayed symmetrisation. To our
knowledge, this is the first known study to explore the reasons for
not opting for symmetrisation among patients undergoing OBCS.
Symmetrisation subsequent to OBCS can undoubtedly provide
better brassiere fitting and improved cosmetic outcome, which
have been correlated with enhanced psychosocial functioning.\(^{(13,14)}\)
Symmetrisation procedures have also been known to pick up
occult cancer, although its incidence is rare at 0.94%–5.33%.\(^{(15,16)}\)
Despite symmetrisation procedures greatly improving patient
satisfaction,\(^{(17)}\) it was found that the asymmetry of breasts was not
the most crucial factor influencing patients’ overall satisfaction.\(^{(18)}\)
This earlier study was, however, conducted on patients who had
undergone mastectomy with reconstruction.

Symmetrisation can be undertaken in an immediate or delayed
setting.\(^{(9)}\) The advantage of immediate symmetrisation is that
both breast surgeries can be performed simultaneously. Delayed
symmetrisation, on the other hand, is usually performed after the
patient has completed adjuvant treatment, allowing for the effects
of radiotherapy on the operated cancerous breast to stabilise before
symmetrisation is attempted. This approach is also advantageous,
as it could allow for reoperation or completion mastectomy that
may subsequently become necessary, which could alter the final
breast appearance. It also avoids the potential risk of double surgical
complications that could occur during concurrent symmetrisation,
such that adjuvant treatment following OBCS may need to be
delayed. Finally, it avoids the need for prolonged anaesthesia and
associated risks, and enables a patient with limited financial
resources to focus initially on tumour management and save up
for aesthetic symmetrisation at a later date.

To our knowledge, the rate of uptake of symmetrisation is not
well documented in the literature. The reported rates of immediate
symmetrisation vary from 0%\(^{(1)}\) to 100%.\(^{(2)}\) Fewer studies regarding
delayed symmetrisation exist. Among patients who did not
undergo immediate symmetrisation, the reported incidence of
delayed symmetrisation ranged from 9.2% to 10.0%.\(^{(10,11)}\) The
incidence of immediate and delayed symmetrisation in our study
was 3.4% and 3.6%, respectively.

Worry and desire to treat breast cancer first was cited as the
most important factor deterring patients from undergoing
concurrent symmetrisation. Prioritisation treatment of cancer over
cosmetic concerns was also a common reason quoted for not
undergoing reconstruction following mastectomy.\(^{(12)}\) This concern
could be addressed by providing reassurance and improved
patient education to increase the uptake rate of immediate
symmetrisation.

Meanwhile, fear of breast cancer recurrence and not being
overly concerned about the cosmetic appearance of breasts
were the two most cited reasons for not undergoing delayed
symmetrisation. Fear of breast cancer recurrence is a common
problem among cancer survivors. While some amount of fear of
breast cancer recurrence is understandable and can be adaptive,
fear in excess can be pathological, especially if it affects patients’
psychosocial functioning. Fear of breast cancer recurrence could
give rise to hypervigilant symptom checking, with inappropriate
attribution of symptoms to cancer recurrence instead of other
ailments, anxiety over subsequent medical follow-ups and
inappropriate excessive worry about physical health, with
psychosocial consequences. Fear of breast cancer recurrence
could also cause behavioural changes, where the patient
engages in limited future planning,\(^{(19)}\) which could explain why
patients in our cohort had not given much thought to delayed
symmetrisation. Our hypothesis is that the key apprehension
in this subgroup of patients is that, should cancer recur on the
ipsilateral breast so that a second surgery became necessary in the
future, any symmetrisation performed would become redundant,
as the shape, size and volume of the cancerous breast would vary
again. It is likely that patients with breast cancer may reconsider
delayed symmetrisation at a later date, as some studies have
suggested that fear of breast cancer recurrence may decrease
with time after diagnosis.\(^{(14)}\)

Not being overly concerned about the cosmetic appearance of
the breast was also a common reason cited for not opting for
delayed reconstruction following mastectomy.\(^{(15)}\) This could be
attributed to patients accepting their bodily changes over time.
These patients tended to be older, with a mean age of 60 years,
which was consistent with our findings.

The present study had good strength, including a very high
participant response rate for completed surveys. The survey
was administered at a mean 21.6 months after OBCS to allow
for stability of cosmetic outcome following treatment and to
more accurately assess the reasons for not undergoing delayed
symmetrisation. The questionnaire explored a comprehensive
range of reasons, such as physical, emotional, social and
psychological aspects, with only ten questions in the survey,
so that the survey could be completed quickly and participant
fatigue could be avoided.

However, our study has some limitations. This was a
relatively small series from a single tertiary healthcare centre. Our
oncoplastic workload was around 17 OBCS a year, which was
comparable to the reported oncoplastic volumes of 19.3 OBCS
a year at some high-volume centres in Scotland.\(^{(16)}\) Most OBCS
in our series involved the round block technique, which is the
more commonly employed oncoplastic technique for the smaller
breast size in Asian women.\(^{(17)}\) Hence, breast asymmetry in these
patients was unlikely to be as marked as in patients undergoing
vertical/wise pattern mammoplasty. Nevertheless, other studies\(^{(18)}\)
using round block technique have found that up to 82% of
patients underwent immediate contralateral symmetrisation.
An assessment of the psychological effects of breast asymmetry,
with particular attention to depression, body image, sexuality and
self-esteem, was also not undertaken as part of this study, as our
primary aim was to determine the reasons for not undergoing
symmetrisation among patients undergoing OBCS.

In conclusion, worry and the desire to treat breast cancer
first were cited as the most common important contributing
factors deterring patients undergoing OBCS from considering
immediate symmetrisation. Among the reasons for not opting for delayed symmetrisation, not being overly concerned about the cosmetic appearance of breasts and fear about breast cancer recurrence were the top cited factors. Given these findings, improved management of patients’ worry and fear about breast cancer recurrence may be implemented to increase the rates of symmetrisation uptake, which, in turn, would help improve cosmetic outcome and patient satisfaction.

REFERENCES

1. Adimulam G, Challa VR, Dhar A, et al. Assessment of cosmetic outcome of oncoplastic breast conservation surgery in women with early breast cancer: a prospective cohort study. Indian J Cancer 2014; 51:58-62.
2. Silverstein MJ, Savalia N, Khan S, Ryan J. Extreme oncoplasty: breast conservation for patients who need mastectomy. Breast J 2015; 21:52-9.
3. Regañó S, Hernanz F, Arruabarrena A, Vega A. Surgery of cosmetic sequelae after breast-conserving therapy. Breast J 2010; 16:389-93.
4. Waljee JF, Hu ES, Ubel PA, et al. Effect of esthetic outcome after breast-conserving surgery on psychosocial functioning and quality of life. J Clin Oncol 2008; 26:3331-7.
5. Sorin T, Fyad JP, Pujo J, et al. Incidence of occult contralateral carcinomas of the breast following mastopasty aimed at symmetrisation. Ann Chir Plast Esthet 2006; 51:e21-8.
6. Schrenk P, Wöll S, Bogner S, Huemer GM, Wayand W. Symmetrisation reduction mammoplasty combined with sentinel node biopsy in patients operated for contralateral breast cancer. J Surg Oncol 2006; 94:9-15.
7. Petit JY, Garusi C, Greuse M, et al. One hundred and eleven cases of breast conservation treatment with simultaneous reconstruction at the European Institute of Oncology (Milan). Eur J Surg Oncol 2002; 28:41-7.
8. Yip JM, Watson DJ, Tiggemann M, et al. Determinants of breast reconstruction outcome: how important is volume symmetry? J Plast Reconstr Aesthet Surg 2015; 68:679-85.
9. Kaviani A, Safavi A, Mirhashi R. Immediate and delayed contralateral symmetrisation in oncoplastic breast reduction: patients’ choices and technique formulation. Plast Reconstr Surg Glob Open 2015; 3:e286.
10. Clough KB, Ihrai T, Oden S, et al. Oncoplastic surgery for breast cancer based on tumour location and a quadrant-per-quadrant atlas. Br J Surg 2012; 99:1389-95.
11. Harvey J, Henderson J, Patel L, Murphy J, Johnson R. Therapeutic mammoplasty - impact on the delivery of chemotherapy. Int J Surg 2014; 12:51-5.
12. Tarkowski R, Szmiel J, Rubin A, et al. Patient’s education before mastectomy influences the rate of reconstructive surgery. J Cancer Educ 2017; 32:537-42.
13. Simonelli LE, Siegel SD, Duffy NM. Fear of cancer recurrence: a theoretical review and its relevance for clinical presentation and management. Psychooncology 2017; 26:1444-54.
14. Thewes B, Bell ML, Butow P. Fear of cancer recurrence in young early-stage breast cancer survivors: the role of metacognitive style and disease-related factors. Psychooncology 2013; 22:1059-63.
15. Lardi AM, Myrick ME, Fugl M, et al. The option of delayed reconstructive surgery following mastectomy for invasive breast cancer: why do so few patients embrace this offer? Eur J Surg Oncol 2013; 39:36-43.
16. Romics L, Macaskill EJ, Fernandez T, et al. A population-based audit of surgical practice and outcomes of oncoplastic breast conservations in Scotland - an analysis of 589 patients. Eur J Surg Oncol 2018; 44:937-44.
17. Lim G, Pineda LA. Applicability of oncoplastic breast conserving surgery in Asian breast cancer patients. Asian Pac J Cancer Prev 2016; 17:3325-8.
18. Giacalone PL, Dubon O, Roger P, et al. Doughnut mastopasty lumpectomy versus standard lumpectomy in breast cancer surgery: a prospective study. Eur J Surg Oncol 2007; 33:301-6.

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