



## Original article

# Acceptance of contralateral reduction mammoplasty after oncoplastic breast conserving surgery: A semi-structured qualitative interview study<sup>☆</sup>



Hansje P. Smeele<sup>a</sup>, Eline M.L. Van der Does de Willebois<sup>a</sup>, Yassir Eltahir<sup>b</sup>,  
Geertruida H. De Bock<sup>c</sup>, Vera C. Van Aalst<sup>b</sup>, Liesbeth Jansen<sup>a,\*</sup>

<sup>a</sup> Department of Surgical Oncology, University Medical Center Groningen, University of Groningen, Groningen, the Netherlands

<sup>b</sup> Department of Plastic Surgery, University Medical Center Groningen, University of Groningen, Groningen, the Netherlands

<sup>c</sup> Department of Epidemiology, University Medical Center Groningen, University of Groningen, Groningen, the Netherlands

## ARTICLE INFO

## Article history:

Received 2 December 2018

Received in revised form

12 March 2019

Accepted 22 March 2019

Available online 25 March 2019

## Keywords:

Breast

Breast cancer

Breast conserving surgery

Oncoplastic surgery

Reduction mammoplasty

Qualitative research

## STRUCTURED ABSTRACT

**Objectives:** Oncoplastic breast conserving surgery (BCS) frequently induces asymmetry. Contralateral reduction mammoplasty (CRM) is therefore part of the oncoplastic approach. Our patients frequently declined CRM when offered as a second-stage procedure after the completion of adjuvant treatments. This qualitative interview study was conducted to explore the factors involved in patient decision-making about CRM.

**Materials and methods:** From the prospective hospital database of patients who underwent oncoplastic BCS for stage I-III breast cancer since 2010, 25 patients were sampled using stratified purposeful sampling on age, preoperative cup size, and time elapsed since the completion of adjuvant treatments. Nine had undergone CRM. Individual face-to-face semi-structured interviews were conducted at the hospital or at patients' homes. The interviews were audio-recorded, transcribed verbatim, and analyzed thematically. Data saturation occurred after analysis of the fifth interview, although variability within the data kept expanding until the last interview was coded.

**Results:** Eighteen patients reported postoperative breast asymmetry. Breast symmetry was important to our patients and information provision about CRM had been adequate. The following factors motivated patients to choose CRM: perceivable asymmetry, satisfaction with the outcome of oncoplastic BCS, and the wish for breast reduction before cancer diagnosis. Patients weighed these considerations against their concerns about surgery risks and recovery time. Reluctance to have nonessential surgery to the unaffected breast was an important reason to decide against CRM.

**Conclusion:** Breast asymmetry is often tolerated after oncoplastic BCS because of concerns about surgery risks and recovery time and reluctance to have nonessential surgery to the healthy breast.

© 2019 Elsevier Ltd. All rights reserved.

## 1. Introduction

Oncoplastic breast conserving surgery (BCS) for breast cancer combines a variety of plastic surgical techniques with BCS. The

integration of these principles allows wide excision margins with immediate reconstruction of resection defects, thereby favoring both oncological and aesthetic outcomes [1]. In oncoplastic BCS, reconstruction of resection defects relies upon two different approaches: 1. *Volume replacement*, which uses autologous tissue from a distant site to replace the breast tissue excised; or 2. *Volume displacement*, which involves breast-reduction and -reshaping techniques to prevent or correct deformities [2–4]. The latter approach typically induces a net loss in volume and, as a consequence, size discrepancy with the contralateral breast [5]. Pronounced breast asymmetry after BCS has been associated with poor postoperative quality of life and psychosocial functioning [6]. To

<sup>☆</sup> Presented at: European Cancer Congress (ECCO) 2017 in Amsterdam, The Netherlands.

\* Corresponding author.

E-mail addresses: [h.p.smeele@student.rug.nl](mailto:h.p.smeele@student.rug.nl) (H.P. Smeele), [e.m.l.van.der.does.de.willebois@student.rug.nl](mailto:e.m.l.van.der.does.de.willebois@student.rug.nl) (E.M.L. Van der Does de Willebois), [y.eltahir@umcg.nl](mailto:y.eltahir@umcg.nl) (Y. Eltahir), [g.h.de.bock@umcg.nl](mailto:g.h.de.bock@umcg.nl) (G.H. De Bock), [v.c.van.aalst@umcg.nl](mailto:v.c.van.aalst@umcg.nl) (V.C. Van Aalst), [l.jansen@umcg.nl](mailto:l.jansen@umcg.nl) (L. Jansen).

**Table 1**  
Concise list of topics addressed in the interview schedule.

<i>Decision-making</i> : considerations (perceived extent of breast asymmetry/influence on daily life or wellbeing/ways to conceal breast asymmetry/age); moment of decision; information received from caregivers
<i>Factors of influence on decision</i> : social influences (caregivers/partner/family members/friends); practical influences (work/hobbies/activities); medical influences (hospital experiences/cancer fear)
<i>Significance attributed to breast symmetry</i> : concern about/indifference towards having (a)symmetrical breasts; desire to have symmetrical breasts
<i>Timing of CRM</i> : best timing according to patient; attitude towards immediate and delayed CRM

attain symmetry, patients who undergo oncoplastic BCS are offered reduction mammoplasty or mastopexy of the contralateral breast, hereafter referred to as “contralateral reduction mammoplasty (CRM<sup>1</sup>)”.

At present, the literature on CRM following oncoplastic BCS is limited regarding patient decision-making. A number of authors previously shared their professional experiences with the acceptance of CRM, but a systematic analysis of patients' views regarding this topic is lacking [7–12]. We performed the current single-center qualitative interview study to identify the factors involved in the decision-making about CRM from a patient perspective to be able to meet patients' needs better.

## 2. Methods

### 2.1. Setting

Patients undergoing oncoplastic BCS in the study center are offered CRM as a delayed surgical procedure after the completion of adjuvant treatments (which comes down to a waiting period of six months if radiotherapy was the last adjuvant treatment completed, and three months in case chemotherapy was the most recent adjuvant treatment).

### 2.2. Study design

This explorative study adopted a qualitative design employing face-to-face semi-structured interviews with patients who either had or had not undergone CRM after oncoplastic BCS [13].

An interview schedule was developed. During pilot interviews, two patients who had received oncoplastic treatment were invited to expand on what was meaningful to them considering operation-induced breast asymmetry. Their input in combination with a review of the relevant literature brought up key topics around which interview questions were formulated and subsequently refined through discussions and role-plays between research team members. The interview schedule was pilot tested with two potential participants to the study, intentionally of whom one had undergone CRM and the other had not. The final interview schedule consisted of fourteen open-ended questions, drawn on the topics listed in Table 1. (See Document, Supplemental Digital Content 1, which demonstrates the original interview schedule.)

### 2.3. Participants

Participants were recruited from an electronic database of all patients undergoing surgery for breast cancer in the study center from 2007. Female patients with unilateral oncoplastic BCS between January 2010 and January 2016 who had no evidence of disease, and had not undergone secondary mastectomy, were eligible to participate in the study. Patients who underwent oncoplastic BCS within six months before the start of inclusion were

**Table 2**  
Patient characteristics.

	N = 25 (%)
<i>Age on interview date (years)</i>	
40–49	6 (24)
50–59	8 (32)
60–75	11 (44)
Median	58
Range	41–72
<i>Oncoplastic operation technique</i>	
Volume displacement within the breast	21 (84)
Volume replacement with LTD or LD flap	4 (16)
<i>CRM</i>	
Yes	9 (36)
No	16 (64)
<i>Marital status</i>	
Married/relationship	19 (76)
Single/widowed/divorced	6 (24)
<i>Highest level of education</i>	
High school and lower	13 (52)
Further education	12 (48)
<i>Employment status</i>	
Employed	18 (72)
Unemployed/retired	7 (28)
<i>Preoperative brassiere cup size</i>	
A/B	5 (20)
C <sup>+</sup>	20 (80)
<i>Time patients had been available for CRM after treatment according to local guideline</i>	
<1 year	4 (16)
1 ≤ years < 2	4 (16)
2 ≤ years < 3	5 (20)
≥ 3 years	12 (48)
<i>Time elapsed between oncoplastic operation and interview date (years)</i>	
< 3	9 (36)
≥ 3	16 (64)
Median	4
Range	1–6
<i>Pathologic tumor stage</i>	
ypT0	1 (4)
pTis	1 (4)
pT1	16 (64)
pT2	6 (24)
pT3	1 (4)
<i>Pathologic lymph node status</i>	
pN0	12 (48)
pN1	11 (44)
pN2	2 (8)

excluded.

The sample size estimation was based on the concept of data saturation, as this is considered the gold standard by which purposeful sample sizes are determined in health science research [14]. Data saturation means that with analysis of the next interview, no new themes are identified. A qualitative study by Guest et al., comparable to the present study in study design, was used to determine a minimum number of participants [14]. Data saturation had occurred within the study's first 12 interviews; we doubled this number because two groups of patients were to be interviewed (that is, patients with and without CRM), which resulted in a final sample of 25 patients. Stratified purposeful sampling was employed. According to the guideline described under the heading

<sup>1</sup> Non-standard abbreviations: Contralateral reduction mammoplasty (CRM).

*Setting*, the time elapsed since each patient had become available for CRM was calculated and used as stratification criterion, in addition to the variables age and preoperative brassiere cup size. Among the eligible patients, only a 22% had undergone CRM; to ensure a number of them would be represented in the study sample, these patients were sampled preferentially.

Informed consent was obtained from all participants to the study. The Medical Ethical Committee concluded that the Medical Research Involving Human Subjects Act does not apply to this study.

#### 2.4. Data collection

Data collection took place between August and October 2016. The interviews were conducted by one member of the research team (HS) who had not been involved in the participants' treatment. Guided by the interview schedule, the participants were interviewed individually in a private clinic room at the hospital or in their homes. All interviews were audio-recorded, transcribed verbatim by the researcher and anonymized. NVivo qualitative data analysis software (QSR International, Melbourne, Australia) was used to manage the transcripts. Eleven participants welcomed the proposal to receive a copy of their interview transcript.

#### 2.5. Data analysis

Transcripts were analyzed according to Ritchie and Lewis' Framework Method, which provides a structured approach to the organization of qualitative data [15]. To allow themes that were not initially anticipated to emerge from the data, a thematic analysis approach was also employed [16].

Together, research team members LJ and HS inductively coded an interview transcript that appeared to cover the broadest range of viewpoints, and decided on an initial coding framework. Subsequently, team members EDW and HS independently coded five more interview transcripts, meeting regularly to compare the codes against each other and to refine the coding framework. Consensus on divergent interpretations was reached through extensive discussions. Author HS applied the codes to the remainder of the interview transcripts and did a final check of all transcripts to examine coding consistency and whether all text had been accounted for. The authors collaboratively interpreted the organized data by comparing the content of the framework matrix within and across participants. Illustrative verbatim comments were selected for quotation. The selected comments are listed in Table 3.

### 3. Results

After the application of the inclusion and exclusion criteria, 60 patients who underwent oncoplastic BCS were eligible for participation in the study, amongst whom 13 (22%) had undergone CRM. The study group consisted of 25 patients, of whom nine had proceeded with CRM (36%). The five patients who declined to take part, were replaced by other patients from the same stratification subgroup. Table 2 provides characteristics of the 25 participants.

The average interview duration was 27 min (range 11–43 min). After analysis of the fifth interview transcript, no new themes were identified and data saturation was reached, although variability within the data kept expanding until the last interview was coded. The final codebook consisted of 37 content-driven codes, organized into the five key themes highlighted below.

The number of patients that spontaneously talked about these themes when discussing their reasoning for undergoing CRM or not are displayed in Fig. 1. Supporting verbatim comments are

presented in Table 3.

#### 3.1. Breast symmetry

It became apparent that four of the 16 patients without CRM did intend to proceed with CRM. Eighteen patients reported that they perceived breast asymmetry after oncoplastic BCS (72%), of whom 9 (50%) had proceeded with CRM at the time of the interview. These findings are displayed in Fig. 2.

Eighteen participants reported that they highly valued breast symmetry. Four of them explained that the restoration of breast symmetry was important because it would help them put their period of illness behind them. Three other participants stated that the significance they attached to breast symmetry involved their desire to start a new romantic relationship. Four participants, aged 42, 50, 65 and 69, specified their age as a contributing factor to choose CRM, saying that they felt too young to live with asymmetrical breasts. On the other hand, among the seven participants who were less concerned about breast symmetry, another 69-year-old participant attributed her age as the main reason for this, which indicates subjectivity in the perception of "old age". The median age of the nine patients who had decided against CRM (61 years) was only slightly higher than that of the group of patients who had opted for or were in doubt about CRM (58 years) (Kruskal-Wallis test  $p = 0.61$ ).

#### 3.2. Information provision about CRM

Twenty-two patients reported that they had received sufficient information about the option for CRM from at least one member of the surgical team. The three patients who appeared not to have been provided with this information, declared they did not consider this a shortcoming as oncoplastic BCS had in their case not led to asymmetry.

#### 3.3. Factors that motivate choosing CRM

All participants primarily based their decision-making about CRM on how asymmetric their breasts looked postoperatively. The seven patients who perceived no considerable breast asymmetry all declared not to consider CRM. For the participants who did perceive asymmetry, the extent to which this affected their clothing choice appeared to be an important factor driving their decision. Twelve patients reported that the need for a large external breast prosthesis or the inability to adequately conceal asymmetry in clothing motivated them to proceed with CRM. The importance of being able to cover up the asymmetry appeared to be related mainly to fear of other people's judgment or rejection.

Patients were also encouraged by a satisfactory aesthetic result of the initial oncoplastic operation. Seven participants who experienced good aesthetic outcomes, trusted that CRM would improve not merely symmetry, but also the appearance of their unaffected breast.

Additionally, nine patients with large or pendulous breasts reported that they considered ending up with smaller breasts as a positive outcome. Their desire to have smaller breasts was often already existent before the breast cancer diagnosis. To some of these participants, the wish for smaller breasts was the decisive factor to proceed with CRM; others regarded breast reduction as a mere secondary benefit.

Two participants declared that they felt reassured from having their unaffected breast operated, because they were aware that the tissue excised would be inspected for occult malignant lesions.

**Table 3**  
Themes and representative verbatim comments.

<p><i>Breast symmetry was important to our patients</i></p> <p>"My breasts have always been important to me, they used to be one of the most attractive parts of my body. I would really like to have them look alike again." (patient 1, aged 42, CRM)</p> <p>"It's important to me to feel like my body is balanced." (patient 16, aged 41, intention to undergo CRM)</p> <p>"When your breasts look that different from each other, it's evident that you had cancer. But from the moment they look alike again, you can put that behind you and move on." (patient 22, aged 66, CRM)</p> <p>"It was important to me to remain attractive, so that I would not feel uncomfortable around a man I just got to know." (patient 25, aged 50, CRM)</p> <p>"I think I'm still worth it, even though I'm going on seventy, to go through life with two identical-looking breasts." (patient 3, aged 69, intention to undergo CRM)</p> <p><i>Information provision about CRM had been adequate</i></p> <p>"I knew about the option [for CRM], it had been thoroughly discussed." (patient 22, aged 66, CRM)</p> <p>"We [the surgeon and I] discussed all options, and weighed up the pro's and con's." (patient 2, aged 65, CRM)</p> <p><b>Factors that motivate choosing CRM</b></p> <p><i>Perceivable breast asymmetry</i></p> <p>"I had so much extra room in one of my bra cups, that it [CRM] was simply necessary." (patient 13, aged 55, CRM)</p> <p>"I have the largest in-lay (prosthesis) there is, but it's still not large enough to completely fill up my bra." (patient 8, aged 47, intention to undergo CRM)</p> <p><i>Inability to adequately cover up breast asymmetry in clothing</i></p> <p>"There's a lot of clothes I can't wear. Clothing that shows cleavage, I can't wear that right now, because you can see the unevenness, and that just looks bad." (patient 1, aged 42, CRM)</p> <p><i>Satisfaction with the aesthetic outcome of oncoplastic BCS</i></p> <p>"Well, I had my follow-up appointment, and then he [the surgeon] asked, well, are you satisfied? With the result? I said well, I am very satisfied. But I added, that other [breast] looks very bad. I would like to have that one adjusted, too." (patient 4, aged 63, CRM)</p> <p>"Because I think the operated [breast] looks better than the other [unoperated breast]." (patient 8, aged 47, intention to undergo CRM)</p> <p><i>Wish for a breast reduction before cancer diagnosis</i></p> <p>"Because a breast reduction had always been on my mind, my neck and shoulders used to hurt. I never even doubted to have it [CRM]. The question was rather when I could be helped." (patient 18, aged 66, CRM)</p> <p>"When they found out I had breast cancer, I obviously disliked that, but I instantly decided that in that case, I wanted to have the size of my breasts reduced too." (patient 22, aged 66, CRM)</p> <p><b>Factors that discourage choosing CRM</b></p> <p><i>Disapproval of additional hospital visits, anesthesia, and recovery time</i></p> <p>"Well, all those things, the surgery, the hospital admission, the whole thing would start all over again, you see ..." (patient 23, aged 43, in doubt about CRM)</p> <p>"I'm self-employed, so... I may not be able to work for a while, and that sort of thing, so, I just can't do it [CRM]. I have to earn my money. So, I'm not doing it." (patient 20, aged 60, no CRM)</p> <p>"If I choose the surgery, I would have to take sick leave and get paid only 70% of the wages! I've already been through that for a while, and things got really tight." (patient 16, aged 41, intention to undergo CRM)</p> <p><i>Reluctance to have surgery to the healthy, unaffected breast</i></p> <p>"I feel like my body has been altered enough. You shouldn't have surgery performed on healthy tissue." (patient 10, aged 59, no CRM)</p> <p>"That other breast is healthy, I really don't want to have that one operated." (patient 14, aged 52, no CRM)</p> <p>"The idea of surgery on my healthy breast, felt like a very radical option. So I therefore asked them [the surgeons] for some kind of alternative, which was to transfer tissues from the side of my body, and to use it to fill up my breast, so that the breast regained its normal shape, and thus my other breast could be left unoperated." (patient 19, aged 47, no CRM)</p> <p>"My operated breast is not like it used to be anymore, it has become, well... It just feels very numb. Actually. And of course I am worried that I will again... Will I have the same problem then, with my other, healthy breast?" (patient 23, aged 43, in doubt about CRM)</p> <p>"I sort of assumed, that my other breast could possibly get breast cancer too. And when you'd have that operation [CRM], you'd have a nice new breast, tra-la-la, and then it might have to be amputated. Or, gets ill after all. I just didn't dare that." (patient 11, aged 56, CRM)</p> <p><i>Comments on the timing of CRM</i></p> <p>"Well, it [immediate CRM] would save you an operation, and it would save you the stress before the operation, because, it remains distressing and you will need general anesthesia. It costs time, the recovery time, so no, if it had been possible to do it directly? Definitely, yes!" (patient 1, aged 42, CRM)</p> <p>"I would have chosen it [immediate CRM]. You see, then all is done in one procedure, and you're done with everything in less time." (patient 4, aged 63, CRM)</p> <p>"No, in this case not for me. Now I could decide very clearly for myself, what I thought of it, and whether I found it [CRM] necessary or not, you see?" (patient 5, aged 58, CRM)</p> <p>"You don't even know if the cancer treatment succeeded or not. Because at that moment it's not at all clear yet, if everything is gone or not. I think I wouldn't have done that [immediate CRM], I would probably have said no, rather wait for a while." (patient 2, aged 65, CRM)</p>
--

### 3.4. Factors that discourage choosing CRM

The interviews revealed another group of patients who expressed reluctance or had decided not to proceed with CRM for a variety of other reasons. The absence of significant postoperative breast asymmetry was the main discouraging factor to undergo CRM for seven patients in our study. These patients saw no benefit in having their contralateral breast operated, as they considered the postoperative result as sufficiently symmetrical.

Patients who did experience postoperative breast asymmetry described a number of factors that discouraged them to proceed with CRM. Twelve interviewees expressed concern about the additional hospital visits, anesthesia, or recovery time a delayed CRM procedure would entail. Recovery time and its anticipated financial consequences were the most commonly mentioned

inconveniences. One self-employed patient explained that she could not afford to be unavailable for work without sick pay for six weeks, which had been a major contributor to her decision not to proceed with CRM despite the asymmetry she perceived.

Furthermore, nine participants (36%) expressed reluctance to have nonessential surgery to their unaffected breast. Some of them disapproved of surgery for purely aesthetic reasons, whilst others were deterred by their dissatisfaction with the aesthetic result of oncoplastic BCS, or the complications they had developed. This negatively affected their expectations of CRM. One patient in our study had told her surgeon about her reluctance to have surgery to her healthy breast in the preoperative setting, whereupon they agreed to use a latissimus dorsi myocutaneous flap to maintain symmetry and avoid the need for CRM. This patient stated that she was highly satisfied with both her decision and the postoperative

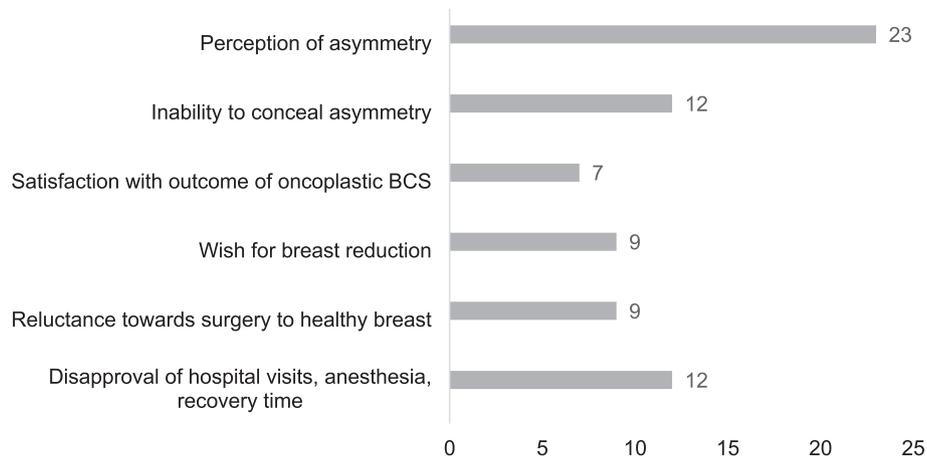


Fig. 1. Numbers of patients who reported which themes had affected their decision.

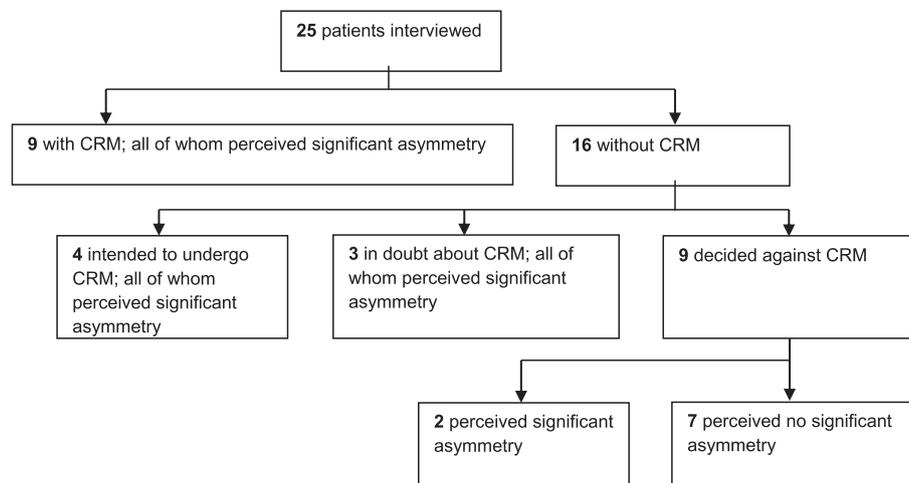


Fig. 2. Participants' decisions on CRM and their perceptions of breast asymmetry after oncoplastic BCS.

aesthetic result.

Albeit a minority view, one participant discussed her fear of cancer recurrence in either breast, explaining that the anxiousness to lose her breast(s) after all had delayed her decision to undergo CRM. Eventually, she did proceed with CRM four years after the completion of her adjuvant treatments.

### 3.5. Comments on the timing of CRM

We invited our interviewees to comment in retrospect on the timing of CRM, which revealed that neither an immediate nor a delayed procedure was unanimously preferred among them. Six patients indicated that they would have greatly appreciated a one-stage procedure, mostly due to the avoidance of additional emotional distress, anesthesia, and recovery time associated with delayed CRM. Seven women made clear that delayed CRM had their preference because they wished to await the oncologic success of local treatment before deciding on CRM or because they wanted to postpone the procedure until they had recovered from breast cancer treatment.

Of the nine patients who underwent CRM, seven had the operation within the first year our protocol allowed the surgery. The remaining two patients had CRM after two and four years respectively.

## 4. Discussion

Most of our participants valued having symmetrical breasts and all to whom this was relevant had received adequate information about the option for CRM. Nevertheless, the majority did not proceed with CRM when offered as a second stage procedure. In our hospital, only 13 of 60 patients with oncoplastic BCS (22%) had CRM thus far with a median follow-up of 4 years after BCS. Among the 13 patients who underwent CRM, 10 had the operation within the first year our protocol allowed the surgery. Our interviews revealed the following factors that motivated to choose CRM: perceivable breast asymmetry, satisfaction with the aesthetic outcome of oncoplastic BCS, and the wish for a breast reduction before cancer diagnosis. The primary factors that discouraged patients from choosing CRM were concerns about surgery risks and recovery time and reluctance to have nonessential surgery to the healthy breast.

Cognitive elements appeared to dominate the decision-making process. It seemed that patients consciously weighed benefits and costs of CRM. They took into consideration the probability of a positive outcome and possible risks. Cognitive elements may in turn be influenced by underlying emotions [17,18]. However, affective aspects played a less prominent role in decision-making in our study and were most apparent in fear in patients who had experienced negative outcomes of the previous oncoplastic

operation. This appeared to substitute the cognitive assessment of the likelihood of a positive outcome of CRM.

Despite an extensive search of the existing literature, no comparable studies that specifically investigated the factors involved in patient decision-making about CRM after oncoplastic BCS were found. In their study of 22 patients who underwent oncoplastic BCS for lower inner quadrant tumors, Clough et al. assumed good tolerance of postoperative asymmetry based on the comparably low CRM rate of 14% in their series [9]. Our results question this inference, as in our analysis, negative perceptions of undergoing additional surgery were a more profound reason to decide against CRM than the acceptance of breast asymmetry. Negative sentiments towards CRM among patients eligible for oncoplastic BCS have previously been described in a number of studies [7–12]. However, these results were not derived from systematic analyses, nor did the authors elaborate on possible explanations. The present qualitative study enriches the limited existing literature on this topic by providing insights into the reasoning behind patients' viewpoints towards CRM.

Previous studies describing patient decision-making about breast cancer surgery in general show that among others, surgeon's preferences and patients' fear of cancer recurrence or dying from cancer are important motivational elements [19–22]. In contrast, in decision-making about CRM, patients' values and preferences appear to be the primary counsellors. We assume that this difference can be ascribed to the fact that CRM is nonessential to cancer treatment and serves quality of life rather than survival.

Several strengths and limitations need to be acknowledged. The sample size turned out to be adequate to reach data saturation. Our sample included seven interviewees who reported no substantial postoperative breast asymmetry and were therefore not interested in CRM. The information-richness of the sample could have been improved by regulating the inclusion of participants with various degrees of postoperative breast asymmetry. Out of the total population of patients who underwent oncoplastic BCS in our center, 22% proceeded with CRM. It is difficult to put this percentage in perspective by comparing it to CRM rates reported by other institutions, as these range between 0 and 100% [7–10,23–33]. It deserves notice, that among the referenced studies, Clough et al. described only patients who proceeded with CRM, which explains the reported CRM rate of 100% [8]. Likewise, Tong et al. studied a group of overweight patients, which may have contributed to a high CRM rate of 68% in their series [29]. The majority of studies, however, do not offer a detailed description of the study group in a way that allowed comparison to our study population. Accordingly, we were unable to verify to what extent our results are applicable to the wider oncoplastic patient population.

Another limitation is that the results do not provide a better understanding of patients' views regarding the timing of CRM. There was no agreement among our participants as to whether concomitant or delayed CRM is the preferred option. Moreover, the reported preferences are inadequate to draw valid conclusions from, considering that after all, our patients only have experience with delayed CRM.

## 5. Conclusions

This study provides insights into the acceptance of CRM among patients treated with oncoplastic BCS. Although this had been our common practice, the study results reemphasize the importance of asking patients during treatment planning about their possible wish for a breast reduction and discussing patients' and doctors' opinions about additional surgery. Accordingly, the options for achieving a balanced appearance can be tailored to each patients' values and preferences, including to those who feel reluctant to

have their healthy breast operated or who wish to avoid a second surgical procedure.

### 5.1. Future perspectives

The study's results suggest that the acceptance of CRM may possibly be improved by offering concomitant CRM in case oncoplastic BCS will predictably result in asymmetrical breasts. To ensure patients' personal needs are met when choosing among the treatment options, a decision aid regarding oncoplastic treatment modalities, including ways to achieve breast symmetry, could be worth developing [34,35]. Such a decision aid could provide information about the different treatment options, highlight the advantages and disadvantages of each option, and clarify patients' personal values through an outcome prioritization tool. From the current study's results we suggest that such a tool should include the themes achieving breast symmetry, low frequency of surgical procedures, avoidance of surgery to the contralateral breast, and keeping the same breast size.

### Ethical approval

Ethical approval was not required. The Medical Ethical Committee concluded that the Medical Research Involving Human Subjects Act does not apply to this study.

### Data statement

If required, the entire data (that is, the interview transcripts and coding framework) can be made available as Supplementary Material. However, the data are in Dutch and may therefore be unsuitable to post.

### Declarations of interest

None.

### Conflicts of interest

The authors have nothing to disclose. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.breast.2019.03.008>.

### References

- [1] Clough KB, Benyahi D, Nos C, Charles C, Sarfati I. Oncoplastic surgery: Pushing the limits of breast-conserving surgery. *Breast J* 2015;21(2):140–6.
- [2] Bertozzi N, Pesce M, Santi PL, Raposio E. Oncoplastic breast surgery: Comprehensive review. *Eur Rev Med Pharmacol Sci* 2017;21:2572–85.
- [3] Savalia NB, Silverstein MJ. Oncoplastic breast reconstruction: patient selection and surgical techniques. *J Surg Oncol* 2016;113:875–82.
- [4] Haloua MH, Krekel NM, Winters HA, et al. A systematic review of oncoplastic breast-conserving surgery: current weaknesses and future prospects. *Ann Surg* 2013;257(4):609–20.
- [5] Noguchi M, Yokoi-Noguchi M, Ohno Y, et al. Oncoplastic breast conserving surgery: volume replacement vs. volume displacement. *Eur J Surg Oncol* 2016;42(7):926–34.
- [6] Waljee JF, Hu ES, Ubel PA, Smith DM, Newman LA, Alderman AK. Effect of esthetic outcome after breast-conserving surgery on psychosocial functioning and quality of life. *J Clin Oncol*. 2008;26(20):3331–7.
- [7] Adimulam G, Challa VR, Dhar A, Chumber S, Seenu V, Srivastava A. Assessment of cosmetic outcome of oncoplastic breast conservation surgery in women with early breast cancer: a prospective cohort study. *Indian J Cancer* 2014;51(1):58–62. <https://doi.org/10.4103/0019-509X.134629>.

- [8] Clough KB, Lewis JS, Couturaud B, Fitoussi A, Nos C, Falcou MC. Oncoplastic techniques allow extensive resections for breast-conserving therapy of breast carcinomas. *Ann Surg* 2003;237(1):26–34.
- [9] Clough KB, Oden S, Ihrai T, Massey E, Nos C, Sarfati I. Level 2 oncoplastic surgery for lower inner quadrant breast cancers: the LIQ-V mammoplasty. *Ann Surg Oncol* 2013;20:3847–54. <https://doi.org/10.1245/s10434-013-3085-4>.
- [10] Hernanz F, González-Noriega M, Pérez RV, Gómez-Fleitas M. Versatility of therapeutic reduction mammoplasty in oncoplastic breast conserving surgery. *World J Surg Proced* 2015;5(3):217–22. <https://doi.org/10.5412/wjssp.v5.i3.217>.
- [11] Acea Nebriil B. Patient information in oncoplastic surgery for breast cancer. *Cir Esp* 2007;82(4):204–8.
- [12] Semprini G, Cattin F, Vaienti L, Brizzolari M, Cedolini C, Parodi PC. Oncoplastic surgery and cancer relapses: cosmetic and oncological results in 489 patients. *Breast* 2013;22(5):946–51. <https://doi.org/10.1016/j.breast.2013.05.008>.
- [13] Kvale S, Brinkmann S. *InterViews: Learning the craft of qualitative research interviewing*. Thousand Oaks, CA: Sage Publications; 2009.
- [14] Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Methods* 2006;18(1):59–82.
- [15] Ritchie J, Lewis J, editors. *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage Publications; 2006.
- [16] Joffe H, Yardley L. Content and thematic analysis. In: Marks D, Yardley L, editors. *Research Methods for Clinical and Health Psychology*. London: Sage Publications; 2004. p. 56–8.
- [17] Kaplan RM, Frosch DL. Decision making in medicine and health care. *Annu Rev Clin Psychol* 2005;1:525–56.
- [18] Power TE, Swartzman LC, Robinson JW. Cognitive-emotional decision making (CEDM): a framework of patient medical decision making. *Patient Educ Counsel* 2011;83:163–9.
- [19] Lee CN, Chang Y, Adimorah N, et al. Decision making about surgery for early-stage breast cancer. *J Am Coll Surg* 2012;214(1):1–10. <https://doi.org/10.1016/j.jamcollsurg.2011.09.017>.
- [20] Mastaglia B, Kristjanson LJ. Factors influencing women's decisions for choice of surgery for stage I and stage II breast cancer in Western Australia. *J Adv Nurs* 2001;35(6):836–47.
- [21] Mac Bride MB, Neal L, Dilaveri CA, et al. Factors associated with surgical decision making in women with early-stage breast cancer: a literature review. *J Womens Health (Larchmt)*. 2013;22(3):236–42.
- [22] Bellavance EC, Kesmodel SB. Decision-making in the surgical treatment of breast cancer: factors influencing women's choices for mastectomy and breast conserving surgery. *Front Oncol* 2016;6:74. <https://doi.org/10.3389/fonc.2016.00074>.
- [23] Rose M, Manjer J, Ringberg A, Svensson H. Surgical strategy, methods of reconstruction, surgical margins and postoperative complications in oncoplastic breast surgery. *Eur J Plast Surg* 2014;37:205–14.
- [24] Pezner RD, Tan MC, Clancy SL, Chen YJ, Joseph T, Vora NL. Radiation therapy for breast cancer patients who undergo oncoplastic surgery: Localization of the tumor bed for the local boost. *Am J Clin Oncol* 2013;36(6):535–9. <https://doi.org/10.1097/COC.0b013e318256efba>.
- [25] Kaur N, Petit JY, Rietjens M, et al. Comparative study of surgical margins in oncoplastic surgery and quadrantectomy in breast cancer. *Ann Surg Oncol* 2005;12(7):539–45.
- [26] De Lorenzi F, Hubner G, Rotmensz N, et al. Oncological results of oncoplastic breast-conserving surgery: Long term follow-up of a large series at a single institution: a matched-cohort analysis. *EJSO* 2016;42:71–7.
- [27] Giacalone P, Roger P, Dubon O, et al. Comparative study of the accuracy of breast resection in oncoplastic surgery and quadrantectomy in breast cancer. *Ann Surg Oncol* 2007;14(2):605–14. <https://doi.org/10.1245/s10434-006-9098-5>.
- [28] Silverstein MJ, Savalia N, Khan S, Ryan J. Extreme oncoplasty: breast conservation for patients who need mastectomy. *Breast J* 2015;21(1):52–9. <https://doi.org/10.1111/tbj.12356>.
- [29] Tong WMY, Baumann DP, Villa MT, et al. Obese women experience fewer complications after oncoplastic breast repair following partial mastectomy than after immediate total breast reconstruction. *Plast Reconstr Surg* 2016;137(3):777–91. <https://doi.org/10.1097/01.prs.0000479939.69211.19>.
- [30] Clough KB, Ihrai T, Oden S, Kaufman G, Massey E, Nos C. Oncoplastic surgery for breast cancer based on tumour location and a quadrant-per-quadrant atlas. *Br J Surg* 2012;99:1389–95. <https://doi.org/10.1002/bjs.8877>.
- [31] Dolan R, Patel M, Weiler-Mithoff E, et al. Imaging results following oncoplastic and standard breast conserving surgery. *Breast Care* 2015;10:325–9. <https://doi.org/10.1159/000437105>.
- [32] Mansell J, Weiler-Mithoff E, Martin J, et al. How to compare the oncological safety of oncoplastic conservation surgery – to wide local excision or mastectomy? *Breast* 2015;24:497–501. <https://doi.org/10.1016/j.breast.2015.05.003>.
- [33] Roshdy S, Hussein O, Khater A, et al. Safety and esthetic outcomes of therapeutic mammoplasty using medical pedicle for early breast cancer. *Breast Cancer (Dove Med Press)* 2015;7:173–8. <https://doi.org/10.2147/BCTT.S83725>.
- [34] Molenaar S, Sprangers MA, Postma-Schuit FC, et al. Feasibility and effects of decision aids. *Med Decis Making* 2000;20:112–27.
- [35] Estabrooks C, Goel V, Thiel E, Pinfold P, Sawka C, Williams I. Decision aids: are they worth it? A systematic review. *J Health Serv Res Policy* 2001;6:170–82.